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20316

Revision 8/11/94  
B. B. Zahlan  
1994/11/11/12/96

**UNIDO and INDUSTRY RELATED SERVICES**

**A. B. Zahlan**

**Table of Contents**

**Executive Summary**

**Part I**

Worldwide Changes in the Structure and Organisation  
of Industrial Technology1

Introduction1

Organisation of this Report3

Definitions4

    IRS and Phases of a Project5

    The Value of Pre-Investment and Investment  
    Services6

Table I.16

Classification of Industrial Support Services6

Table I.28

Share of Total Project Cost Attributable to IRS8

    The Special Place of Professional Services  
    in Post-Investment Phase9

Table I.310

EEC Production10

Table I.411

Estimated Value of Services in Global Economy11

Advantages and Disadvantages to the Firm of

Outsourcing and IRS11

Adaptation of the Organisational Structure of the  
Monolithic Firm12

IRS, Transfer of Technology to Developing Countries  
and the Globalisation of the World Economy13

International Trade in Services13

Outsourcing in Engineering

    Illustrative Examples15

**Part II**

Developing Countries and IRS16

Introduction16

The Science and Technology System and the Place of  
Industry Related Services in the Network18

IRS in Developing Countries

    Market and Structure20

    Expenditures on IRS21

    (i) Expenditures on IRS to Implement New  
    Investments21

    The Market in Developing Countries for

    Consulting and Contracting Services22

        The International Supply of Consulting and  
        Contracting Services22

Table II.123

How the Top 200 Design Firms Shared the World's 1990  
Market23

Table II.224

How the Top 250 International Contractors Shared the  
World's 1990 Market24

    International Competition for Consulting  
    and Contracting Services24

(ii) The Share of IRS in Industrial Output	26
(iii) Exported IRS Services	27
(iv) Workers Remittances	27
Illustrative Examples in Selected Areas	27
The Arab Countries	28
Latin America	28
Africa	28

### **Part III**

Implications of the Present Underdeveloped State of IRS to developing Countries	29
IRS and Employment Creation in Developing Countries	30

IRS and Opportunities for Parastatals to Initiate Large Scale Development	30
The Development of Small IRS Firms	
Absorption of Financial Assistance	31
A Small Missing Inputs & a Large Loss of Opportunities	32
Export of Jobs	33
Missing Linkages	33

### **Part IV**

Prospects for the Development of IRS in Developing Countries	34
Introduction	34
Shortcomings and Challenges facing IRS in Developing Countries	34
Instruments for Development	
the Major Players in the Market	36
Determinants of Prospects of Developing Countries	36
Availability of Professional Manpower	37
Policies and Procedures for the Promotion of a National Science and Technology System	37
Policies and Procedures for the Promotion of National Consulting and Contracting Organisations	38
Environment Conducive to Outsourcing Services by the Dominant Parastatals and Large Private Firms	38
Availability of Know-How on how to Establish and Develop IRS	39

### **Part V**

Recommendations	39
Introduction	40
Recommendations	40
(i) Recommendations Concerned with the Establishment of a Favourable Environment for the Promotion of IRS	40
(ii) Recommendations Concerned with Professional Associations	42
(iii) Recommendations Concerned with Enterprises	43
(iv) Recommendations Concerned with Parastatals	43
(v) Recommendations Concerned with Sectoral Organisation	43

(vi) Recommendations Concerned with Training in Modern Methods of Technology Management	44
(vii) Recommendations Concerned with Training in Modern Business Organisation and Promotion	45
(viii) Recommendations Concerning the Undertaking of Systematic Reviews and Evaluation of Implemented Programmes	45
Translation of Recommendations into Plan of Action UNIDO's Action Plan	46
Country Level	46
Technical Assistance at Policy and Institutional Level	46
Technical Assistance at Firm Level	48
Consulting and Contracting	49
Developing Outsourcing Capabilities in Parastatals	50
Regional and International Level	50
Technical Assistance at Policy and Institutional Level	51
Technical Assistance at Firm Level	51
Cooperation with Other UN and International Institutions	52
Financing the Action Plan	52
Development Banks	53
World Bank	53
Implications of Action Plan for UNIDO	54

## .c.UNIDO and INDUSTRY RELATED SERVICES;

.c.A. B. Zahlan ;

### .c.Executive Summary;

Industry Related Services (IRS) are activities whose strategic prominence was recognised when industrial firms began to externalise them. This Report is in Five Parts and is concerned with the relationships of IRS to the processes of economic development and UNIDO's future role in these processes.

In Part I of the Report, the extent to which IRS <sup>have become</sup> are essential to the investment phase (where 15% of cost of investment is towards IRS) and to the production phase (where services may consume 50% or 60% of cost of production, <sup>of which approximately a third is towards IRS</sup>) is discussed. It is estimated that in 1990, OECD countries devoted \$2,700 billion of their GDP to IRS. It is shown in Part I that the ratio of [the expenditure on IRS during industrial production] to [the expenditure during the investment phase] is four (4) within the EC.

Developing countries devote some \$100 billion of IRS towards GFCF investment, 75% of these IRS are imported and the rest is locally generated. Developing countries are unable to devote sufficient resources towards IRS during the phase of industrial production; they do not generate an adequate amount locally and the countries cannot afford to import all their IRS requirements. The shortage of foreign exchange prevents them from expanding their imports of IRS .

In Part II, it is shown that developing countries should <sup>to provide</sup> have spent <sup>d</sup> \$600 billion on IRS during 1990; in reality, however, the upper estimate of their IRS imports is around \$137 billion. Locally generated IRS were not substantial. This gap in services accounts for low productivity, low capacity utilisation and the various problems associated with industrial development. It is argued in Parts I and II that the development of local IRS <sup>has become</sup> is central to economic growth. The importance of unlocking in-house IRS in parastatals is discussed.

Part III is devoted to a brief expose of the implications and likely consequences of the persistence of the present gap in IRS. It is shown that growth will continue to be stymied and that many developing countries will be exposed to further social and political disasters. Relentless, rapid and dramatic technological changes are forcing economic transformations in which many developing countries are unable to participate in a positive and beneficial manner.

The shortage of IRS is also reflected in the fact that most developing countries have a massive backlog of unspent aid funds. This fact vitiates UNDP's policy of country execution: developing countries have to be assisted to acquire the necessary IRS to enable them to execute projects and programmes.

In Part IV it is noted that developing countries have made massive investments in their educational systems and manpower over the past three decades: IRS consist essentially of activities performed by professionals. The process of outsourcing has opened up numerous opportunities that developing countries could adapt to their respective

conditions. Thus although the situation appears to be grim, there is sufficient international experience to indicate that, given effective action on both the national and international levels, a great deal may be achieved within a reasonable period of time.

Part V is devoted to the presentation of a set of Recommendations and an Action Plan for UNIDO to consider. The Recommendations are designed to promote the development of an environment that is supportive of IRS. It being noted in earlier parts of the Report that IRS are an integral part of a Science and Technology System that all modern states require to undertake the heavy demands of industrial production.

The Recommendations are also concerned with professional associations, enterprises, parastatals, sectorial organisation, training in technology management and in modern business organisations and the undertaking of systematic evaluation of implemented programmes.

The Action Plan recommends that UNIDO assumes a leadership role in assisting developing countries to establish national IRS systems. Here, UNIDO has considerable experience which it could bring to bear on this mission.

The Action Plan discusses various sources of likely financing. Development banks provide more than \$40 billion a year in aid to finance new investments. UNIDO could contribute towards increasing the participation of national IRS in the investment phase. Industrial production could be increased substantially if high quality IRS were to become available locally. Thus UNIDO would assist in developing IRS during the investment and the production phases on a reimbursable basis.

**.c. Part I;**

**.c. Worldwide Changes in the Structure and Organisation of Industrial Technology;**

**.c. Introduction;**

During the past few decades leading industrial firms have engaged in a vast process of externalising many of the non-core operations of their firms. These changes in structure and modes of operation of industrial firms have strategic implications to developing countries. This process has been also called de-integration, out-sourcing and externalising.

Industrial activity is thus no longer vertically integrated within the firm but is rather based on a complex network of relationships involving extensive transactions of services and sub-contracting. The family of firms that provide industry with services are called Industry Related Services (IRS, also known as professional and business services) and constitute an important and growing component of the service sector. IRS involve, among other activities, the preparation of software, the undertaking of R&D, consulting, testing, quality control, auditing, publishing, market studies, legal and insurance

services and information.

UNIDO's Global Report for 1992/93 in its analysis of the economic performance of various developing countries concludes that :

" the foremost obstacle to ... using borrowed technology is the development of the capacity to absorb and adapt it to the special conditions of the country concerned. ... The capacity to absorb technology is the crux of the problem.... It becomes evident at this point that the parallel development of producer services is essential to strengthening the technological capacity and increasing the productivity and competitiveness of an economy. ... It is imperative, however, that developing countries should concentrate their efforts on the development of indigenous producer services that would enable them to assimilate and adapt advanced technologies...."

[UNIDO, Industry and Development: Global Report 1992/93, p.181, Vienna, 1992]

Michael Porter in his seminal book The Competitive Advantage of Nations (The Free Press, New York, 1990) stressed that though it is companies and not nations that are on the front line of international competition yet it is the resources provided by the home base that play a central role in a firm's international success. Much of the inputs that a nation provides its firms are transmitted through the agency of IRS.

The processes of externalisation may be best illustrated by the fact that the US\$ 1,269 billion at 1985 prices ~~were~~ invested in industry in Europe over the period 1980-1989, ~~these investments~~ resulted in a decline of industrial employment from 46 million to 38 million; the increase of employment took place in the IRS sector. (UNIDO, Development of Industry Related Services in the Maghreb Union Countries, p.14, June 1992; henceforth UNIDO-A ). In fact, the secondary sector in OECD countries showed a reduction of stable employment during the period 1981-1990: from 37 million to 33 (Europe); and remained at 34 million in the US. In the US the process of outsourcing was nearly completed during the 1970's. The tertiary sector expanded: from 53 to 63 million in Europe and from 74 to 92 in the USA.

OECD statistics quoted in UNIDO-A, (op.cit., p. 29 ) show clearly that the value added IRS has increased from 51.3% to 56.3% over the period 1980-1990. The largest contributors are: producer services, financial and insurance, professional and business services.

The widespread development of outsourcing has also been driven by the process of globalisation: firms that procure in different countries can now sub-contract the manufacturing of much of the components that they require for the production of a photocopier or a car. This reduces their capital requirements and increases their flexibility. The firm retains the capacity to design its products, specify standards, select through careful testing and

supervision its sub-contractors and exercise quality control over its purchases. The improvements in the means of transport and communication have reduced the importance of distance to the operations of the firm.

Outsourcing has also been instrumental in the industrialisation of developing countries: it is now possible for a firm to develop its capabilities piecemeal. It is no longer necessary for a developing country to acquire industrial capabilities through the difficult and restrictive route of planning, from the outset, the complete manufacturing of the ultimate product: an enterprise can start by producing components and expand the range of its production according to its abilities and the demand on its services. But for a firm to be able to embark on manufacturing it must be assured of high quality IRS.

An important by-product of the development of IRS has been job creation: IRS contributes to efficiency enhancement, cost reduction and economic expansion through higher capacity utilisation.

A number of important consequences have emerged from these trends:

- specialised technological services that were previously only available to major firms now became available to medium and small firms thus accelerating the rate of diffusion of industrial know-how;

- a massive redistribution of employment from the industrial sector to the service sector;

- a massive change in the channels for the transfer of technology: developing countries can now organise their programmes for the acquisition of technology in more flexible and efficient manner.

These essentially revolutionary changes present a wide range of opportunities to developing countries. The unpackaging and restructuring of many industrial activities into a large number of Industry Related Activities each of which can be acquired separately has simplified considerably the process of industrial planning and development. In other word, developing countries now have greater opportunities to participate in the international economy.

X  
 Industry Related Services is<sup>A</sup>matrix that integrates the various constituents of the national economy. The importance of IRS is due to the fact that they embody a considerable proportion of technology and know-how of crucial importance to industrial production; this means that in any activity that aims to transfer technology or to expand national capabilities Industry Related Services play a major and decisive role.

#### .c.Organisation of this Report;

This Report is in five parts. Part I presents a brief description of the strategic importance of IRS services in the economies of

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 However, there is a... for development...  
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 ...the...  
 ...the...



both industrial and developing countries; the purpose of Part I is to present a quantitative assessment of the share of GDP arising from IRS.

Part II discusses IRS services in developing countries: it estimates allocations to this activity and discusses structural and institutional issues.

Part III discusses the implications of the underdeveloped state of IRS in developing countries. The developmental crisis is related to the persistence of weak IRS in developing countries.

Part IV discusses the prospects for the development of IRS in developing countries: it shows that developing countries now possess the requisite resources for establishing and developing IRS.

Part V is concerned with recommendations, <sup>and a plan of action</sup> ~~an action plan for~~ UNIDO, ~~the financing of UNIDO activities~~ in assisting developing countries to develop their IRS. <sup>Related financing mechanisms are also presented.</sup>

**.c. Definitions;**

The UNIDO-A Report defines and discusses in detail the subject matter of this Report; it states:

"The most important of all changes is the relocation of the 'industrial brain' - i.e. the functions related to the development, technological updating and management of industrial operations - from the industrial plant to the service suppliers, and mainly to those supplying professional services. Knowledge has been estimated to account for 70 per cent of the development costs of an industrial product; in the services, they account for some 90 per cent of a product. The producer services ... are becoming ... the main determinant and 'locomotive' of socio-economic growth." (op. cit., p.34)

The process of establishing and operating production facilities calls for a wide variety of activities. These activities vary across the life cycle of a project: during the early phase of establishing an industrial facility it is necessary to obtain financial, consulting, contracting and legal services; once the plant is built it is necessary to secure producer services: product design, transport, communication, R&D, quality control, catering, R&M, training services, storage and insurance services.

The extent to which a firm retains or externalises a service depends on a wide variety of factors. The management of the firm has to take into consideration the availability of the service, its cost and quality, in comparison with what an in-house department is already providing. The extent to which the firm could improve on the quality and or cost of the service through outsourcing is an important factor in the decision.

Thus services are an integral part of the production process: without them no manufacturing can take place. The fact that a particular function is performed outside the location of a plant does not change its nature: thus the distinction between the process of manufacturing and IRS is artificial and is adopted here because this has become the traditional method of defining these functions.

Obviously, the process of externalising non-core services by an established firm is different from the process when a new firm is being established. Once industry related services of high quality and reliability are available new firms tend to purchase such services from the market. This reduces the complexity of establishing a new firm. In OECD countries there is now an abundance of services; new firms are planned with this in mind.

In developing countries the quality and standards of many services vary a great deal: some are of a rudimentary nature others may be of international quality. However, large firms and parastatals still perform most of their functions in-house and the process of outsourcing is still in its infancy.

#### .c2. IRS and Phases of a Project;

The classification of IRS may follow different methods (see UNIDO-A, op. cit. for more details). Table I.1 presents one such classification. Each one of the services listed in Table I.1 may be further analysed into sub-categories. IRS in industrial countries have been analysed into 300 or more separate activities. However, for the purpose of this Report it is only necessary to identify the broad categories of these activities.

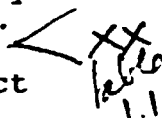
Each service makes an input at a different point of a project investment-production cycle (see UNIDO-A, op. cit., p.10):

- Phase 1 Project generation (planning and feasibility analysis);
- Phase 2 Project execution (engineering, project management, procurement, construction and commissioning);
- Phase 3 Organisation and systems (design and implementation);
- Phase 4 Production Management;
- Phase 5 Human resources development;
- Phase 6 Operation and operating planning.

Phases 1 to 3 constitute the pre-investment and investment stage; Phases 4 to 6 constitute the production stage. Each one of these phases involves a complex number of specialised services that may be provided in-house or purchased from outside contractors.

In order to draw attention to the stage at which the input of a particular service is required the services listed in Table I.1 have been further categorised as:

- T: Technical and Professional Services; and,
- P: Production Services.

Handwritten note:  Table I.1

The stages of the investment-production cycle at which the input of a particular service is required is shown in columns two to four. Four stages are identified:

- Up Stream includes all services needed before production commences;
- On Stream and On Stream Parallel are needed during the production phase;
- Down Stream are the services needed to market products and also to prepare for a new production cycle with new designs and processes.

**.c2. The Value of ~~Pre-Investment and Investment~~ Services;**  
*Industry related services*

Industry Related Services consume substantial financial resources. It is necessary to estimate their cost in order to assess their economic importance. Since only industrial countries publish sufficiently detailed statistics that permit an estimate of the contribution to GDP to be made it was necessary to develop a simple method for assessing the economic importance of IRS in developing countries.

Services may be readily decomposed into two broad components:

[ Pre-investment and Investment Services ] + [ Post-investment Services ]  
*Production and post production*

~~In the following~~ we shall look at these two components separately in order to estimate the relative cost of these two inputs.

Consulting and contracting services are provided during the Pre-Investment and Investment phases. Table I.2 shows the share of the cost of various pre-investment IRS.

In the EEC countries GFCF is about 22% of their 1990 GNP and amounted to \$900 billion in current prices. According to the estimates in Table I.2 these countries consumed consulting and contracting services to undertake their investments at about 15% of GFCF, that is about \$135 billion.

In order to compare the total contribution of professional services to the production of industrial output with the consumption of services during the investment phase the value added data for 1990 will be utilised, Table I.3. The GFCF share of \$3,000 billion value added amounted to \$666 billion. The contribution of consulting and contracting to value added is 15% of GFCF, or \$100 billion in 1985 dollars.

.c. Table I.1;

.c. Classification of Industrial Support Services;

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	Up Stream	On Stream	On Stream Parall el	Down Stream
<b>General &amp; Preliminary Studies (T)</b>				
Technical and economic pre-feasibility studies	*	*		*
Technical and economic identification and evaluation studies	*	*		*
<b>Economic and Financial Consulting &amp; Studies (T)</b>				
Pre-feasibility & feasibility studies	*	*	*	*
Financing consulting & studies	*	*	*	*
Fiscal & taxation consulting & studies	*	*	*	*
<b>Architectural and Civil Engineering (T)</b>				
Pre-feasibility & feasibility studies	*	*		
Consulting and basic engineering	*	*		
Detailed engineering & drafting	*	*		
Procurement, testing and inspection	*	*		
Maintenance & Repairs		*		
<b>Chemical-Mechanical-Electrical Engineering (T)</b>				
Pre-feasibility & feasibility studies	*	*		
Consulting and basic engineering	*	*		
Detailed engineering & drafting	*	*		
Procurement, testing and inspection	*	*		
Maintenance & Repairs		*		
<b>Project Implementation &amp; Management (T)</b>				
Project Management & Supervision	*	*		

Procurement, testing and inspection	*	*		
Testing of processes, operations & products	*	*		
Pre-production support operations				
Product & process development & design (T)	*			
Identification of production inputs(T)	*			
Selection & Procurement of production inputs (P)	*			
Movement & storage of production inputs (P)	*			
Production support operations (T)				
Production planning, management & control		*	*	
Tests, inspections, & quality control		*		
Process, product development and design		*	*	
Technical & technological innovation & improvements		*	*	
Repair & Maintenance		*	*	
Post-production support operations			*	
Sales and distribution (P)			*	*
Customer services (T,P)			*	*
Advertisement and Public Relations(P)			*	*
Managerial Services (T)				
Corporate strategy & planning			*	
Corporate management			*	
Project planning & coordination			*	
Resources mobilisation & allocation			*	
Human resources development & training			*	

Personnel selection & recruitment			*	
Administration & Logistics				
Legal assistance & consulting (P)	*	*	*	*
EDP: computer applications (T)	*	*	*	*
Express courier services (P)	*	*	*	*
Logistics & Administrative support (P)	*	*	*	*
Accounting, finance & taxation (P)	*	*	*	*
Security (P)		*	*	
Cleaning & housekeeping (P)		*	*	
Banking, Financial and Insurance Services (P)	*	*	*	*
Brokerage Services (P)	*	*	*	*
Real estate	*	*	*	*
Renting, leasing & hiring movables (P)	*	*	*	*

Source: UNIDO-A, op.cit. p. 12.

.c. Table I.2;

.c. Share of Total Project Cost Attributable to IRS;

Type of Work Requiring Engineering Design and Consultancy Services	Percentage of Total Cost
<b>Architecture</b>	
Architectural Design and Contract Administration	3.0-6.0
<b>Buildings and Infrastructure</b>	
Feasibility Studies	0.5-2.0
Detailed Design	3.0-6.0
Construction Supervision	5.0-8.0
<b>Sub-Total</b>	<b>8.0-16.0</b>

Process and Industrial Engineering	
Feasibility Studies	1.0-2.0
Design or process engineering	1.0-3.0
Detailed engineering	7.0-10.0
Procurement and construction supervision	1.0-2.0
<b>Sub-Total</b>	<b>10.0-17.0</b>

Source: The Export Marketing of Technical Consulting Services from Developing Countries, Geneva, UNCTAD/GATT, 1986, p.31 quoted in UNIDO-A, p.44, op. cit.

**.c3. The Special Place of Professional Services in the Production Phase;**

(X77) The importance of services in the 1990 EEC economy may be high lighted by comparing the value added of services (\$1,086 billion) with the value added of the secondary sector (\$1,013). The total value added of the EEC economy was \$3,000 billion.

The value added by professional and business services in the same year in 1985 prices was \$495 billion; the sales value of professional services was \$522 billion. The share of professional services in total sales (valued at \$5,704 billion) was 9%; the share of professional services in total value added was 16.5%. The category professional services as defined here excludes distributive services (transport, storage, communications, wholesale and retail trade) and producer services (money and banking and insurance).

The relative expenditure on post-investment and pre-investment services is thus  $[\$495 - \$100] / [\$100] = 4$ . The total expenditure on IRS includes expenditure on all phases and is thus 5 times the expenditure on the investment phase.

**.c. Table I.3;**

**.c. EEC Production;**

*Sub 3 of 4.*

Sectors	Value Added (1985 prices & exchange rates)			
	1980		1990	
	Million \$	%	Million \$	%
<b>Primary Sector</b>	93,072	4.0	90,999	3.8

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<b>Secondary Sector</b>	920,537	39.1	1,269,348	25.6
Fuel and Power	108,318	4.6	383,894	7.7
Manufacturing	647,946	27.5	724,513	24.6
Building & Construction	164,273	7.0	172,983'	5.9
<b>Tertiary Sector</b>	1,214,284	51.6	1,685,509	56.3
Distributive Services	432,061	18.3	544,843	18.5
Transport & Storage	99,976	4.2	123,915	4.2
Communications	45,652	1.9	59,613	2.0
Trade	286,433	12.2	361,315	12.3
Producer Services	456,819	19.4	732,212	24.6
Financial & Insurance	103,745	4.4	150,096	5.1
Professional & Business Services	301,518	12.8	495,664	16.8
Hotels & Catering	51,556	2.2	77,452	2.6
Non-market Services	325,404	13.8	390,454	13.3
Owner Occupied Dwellings	127,157	5.4	182,828	6.2
<b>ECONOMY</b>	2,355,050	100.0	2,945,540	100.0

Source: UNIDO-A, op.cit. p. 29; quoting OECD National Accounts 1977-90, Volume II, OECD, Paris, 1991

Notes:

(\*) The level of consumption and the quality of professional services determine the efficiency and capacity utilisation of the industrial sector. It is assumed for the purposes of this Report that a modern industrial economy will consume four times as much professional services to operate the industrial sector as it required in the investment phase.



The world's total production in 1990 was \$22,298,850 million. Table I.4 shows the national groupings that generated this output. 24 high income countries consisting of OECD countries plus Israel, Singapore, Hong Kong and Kuwait contribute 73% of the total world output. In the second column is entered the estimated values of GFCF and the cost of professional services consumed to generate the GFCF. The last column is based on the amount of IRS that would be required to operate these investments effectively. For the purpose of this Report the ratio of the cost of IRS required to operate investments to the cost of IRS to plan and implement investments is assumed to be 4 as found above for the EEC. High income countries generate most of their requirements (\$2,695 billions) of IRS locally. ~~Middle income countries import and generate of their requirements of IRS.~~

.c. Table I.4;

.c. Estimated Value of Services in Global Economy;  
(1990, in \$, billions)

Grouping	GDP	GFCF	Consulting & Contracting (T) (15% GFCF) <sup>12</sup>	"Optimal IRS" (5-T) 3.5
World	22,299	4,383	<del>659</del> 526	3,295 1841
Low-income economies (inc. India and China)	916	183 (20% of GDP)	28 22	140 77.
Middle-income Countries	2,438	610 (25% of GDP)	92 73	460 256.
High-income Countries	16,316	3,590 (22% of GDP)	<del>539</del> 431	<del>2,695</del> 1508.

for world EEC

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.c. Advantages and Disadvantages to the Firm of Outsourcing and IRS;

The advantages of the new forms of organisation imposed themselves in the market place. These are:

1.0 Reduced cost of services because the firm now paid for the service when it needed it; the firm no longer had to sustain in-house facilities when not required.

2.0 Reduction of the cost of in-house supervision of non-core services. Relieving management from a wide range of personnel

problems associated with the large staff employed by the service departments within the firm. Consequently, management could focus on end products rather than on the services required to produce the end products.

3.0 The quality of the services improved because:

3.1 of intensive competition among service companies;  
 3.2 the new IRS firms specialised in a single service which they provided to several clients and therefore had the opportunity to introduce constant improvements in quality and a reduction in the price of the service. Both of these developments benefitted the users of these services.

4.0 An increase in the operational flexibility of the firm. Through outsourcing the firm was able to utilise different IRS suppliers in different geographic areas and no longer depended on its limited internal source of supply. The firm could then schedule the inputs to suit its production schedule in an optimal manner. In other words, the firm was no longer bound by the constraints imposed by its own limited in-house services.

The disadvantages of the new forms of organisation are:

1.0 Loss of control or increase cost of control over the inputs to the firm: the new form of organisation require that the firm develop new management capabilities to enable it to evaluate potential suppliers of services and for monitoring their services.

2.0 Sub-contracting increases the opportunities of leaks to competitors of a firm technological capabilities, plans and commercial activities.

3.0 The increase in lead time in planning: the identification of suppliers of services and the establishment of their competences, quality control, and pricing calls for substantial effort and time. Thus firms need to look ahead and plan changes in their production programmes. Generally, large firms develop close relations with their sub-contractors.

#### **.c. Adaptation of the Organisational Structure of the Monolithic Firm;**

Not all large organisations adopted the path of externalisation. However, these firms had to adapt to the competition by introducing open-market conditions for all their in-house service producers and making them responsive to outside competition. These in-house IRS suppliers who were competitive were then allowed to market their services outside the mother firm.

#### **.c. IRS, Transfer of Technology to Developing Countries and the**

### **Globalisation of the World Economy;**

The rapid improvements in both communication and transport systems have led to considerable expansion in the spread of international firms. International firms now resort to considerable sub-contracting to smaller firms spread globally: some firms out-source up to 80% of the components that they utilise in the production of their final products. The sub-contracting extends to both services and manufacturing and is geographically delocalised. Thus, the accounting services of a company may be performed in one country and thanks to the modem head quarters are in constant contact with the accountants who may be based in another country thousands of kilometers away. Large multinational firms retain the control of finance, management, R&D, "quality" and marketing over production but essentially procure components manufactured to their specifications and designs by distant contractors who compete fiercely for their market.

In all of these processes of globalisation and sub-contracting IRS play a critical and strategic role: no country can progress far without developing Industry Related Services in parallel with the development of manufacturing. The globalisation of the world economy now enables each country to identify its comparative advantages and to build at its own speed the industrial activities through the mechanisms of sub-contracting. A diligent management is able to accumulate technology at the speed that it can sustain. Although this route to development is neither easy nor simple the performance of a substantial number of countries has proven its feasibility and practicality.

What is important to stress here is that no country can seek to develop its technological capabilities without concomitant and serious attention being given to the development of its IRS.

### **.c. International Trade in Services;**

Trade in some services has been of long standing. In fact, international trade in engineering and contracting services began to take a substantial scale during the first half of the nineteenth century when the construction of harbours and railways increased worldwide. The export of consulting and contracting services related to the establishment of large agricultural development projects in European colonies involving large scale civil engineering (irrigation canals, dams, terracing, land reclamation) in addition to the expansion of transport systems (Suez and Panama canals, railways, harbours, roads) assumed a massive scale.

Trade in consulting and contracting services grew unabated over the past two centuries. As technology increased in complexity so did these services. Yet, and despite the strategic importance of these services they did not receive adequate attention in either the compilation of statistics or at the level of policy making.

The focus was always on the products generated by these services rather than on the service itself.

The recent prominence that the service sector has assumed in industrial countries and the current Uruguay Round have finally changed the perception of the service sector in the national economy. Messerlin and Sauvant noted that the "progress achieved in Uruguay Round negotiations on services testifies that trade negotiators and national decision makers are coming to share a perception already common among economists: that trade in services is similar in fundamental ways to trade in goods." (The World Bank and The UNCTC, The Uruguay Round: Services in the World Economy, 1990 Washington and New York].

This is a significant development. The service sector and specially IRS activities have finally been recognised as vital to the national economy of all states; furthermore this international prominence of the service sector has made services a subject worthy of the attention of policy makers and international organisations. The liberalisation of international trade in services also calls on developing countries to act promptly to improve the efficiency of their activities in IRS if these are to be able to compete with highly developed international firms.

GATT estimated that world trade in merchandise and services for 1988 were: \$2.9 trillion and \$600 billion (17% of world trade) respectively. By 1990 world trade expanded to \$4.3 trillion of which \$820 billion or 18.9% was trade in services.

[Martin Wold, "The Gatt makes its last stand," Fin. Times 20 January, 1992]. UNCTAD published: Trade in Services: Sectoral Issues (1989) with a view to enhancing international understanding of the various sectorial

This proportion of trade in services is in inverse proportion to the ratio of employment and value added in the economies of OECD countries. However, not all services are tradeable because services are purchased when they are produced and they are not storable. It was estimated in 1985 that only 11% of the gross output of services in the UK are traded compared with 33% for manufactures. [Michael Prowse, "Why free trade will be an elusive goal," Fin. Times 27 September 1985].

However, extensive developments in information technology has already changed some of these assumptions: thanks to the modem it is now possible to generate services and to trade them simultaneously in distant markets. Furthermore, multimedia technology has made it possible to store "entertainment" for delivery in different markets.

#### .c. Outsourcing in Engineering: Illustrative Examples;

Outsourcing in engineering has been on a very extensive scale as the following examples indicate. The American firm Perkins Engines, specialises in manufacturing diesel engines, and

employed 10,000 workers in 1981 when it was a vertically integrated firm. The firm produced 400,000 engines a year, valued at \$1 billion; the engines were in either complete units or in kit form. By 1991 it had made considerable capital investments in its production facilities, reduced its staff from 10,000 to 3,200 out of whom 2,000 were paid on an hourly basis. The company reduced the number of firms supplying components from 470 to 270, increased the number of components which are outsourced, increased inventory turnover from 4 to 12: that is, the inventory is turned over once a month instead of once every 3 months.

A smaller company, had a similar experience: Peter Brotherhood, had a turnover of £22 m in 1990 and this declined to £18 in 1991. Peter Brotherhood manufactures: steam turbines for marine and industrial applications (one third of output), one third gas compressors applications for petrochemical and process industries, one third special purpose machinery built to customers specifications and/or joint design. It reduced its work force from 1,700 to 400; it outsources 90% of the components it utilises and it tripled output per worker on its staff. [Source: Stewart Dalby, "The lean, mean fighting machine" *Fin. Times* March 14, 1991]

*Interference from the... No reference to the... as the...*

.c. Part II;

.c. Developing Countries and IRS;

.c. Introduction;

A number of important changes are sweeping developing countries. In 1990 developing countries had only 28% of total world output; stimuli transmitted by trade with industrial countries was assumed to be necessary to improve their economic conditions. The 1993 UN World Economic Survey finds that developing countries are outpacing the growth rates of industrial countries and that this growth is home grown and not driven by trade with the industrial world. The average growth rate of developing countries during 1992 was 5% with China expanding at 12.8%; this is to be compared with a growth rate of 1.5% in industrial countries.

Many developing countries are engaged in major industrial restructuring programmes with a view to increasing their international competitiveness. The export imperative is specially important to highly indebted nations. Many of the large industrial complexes built during the past three decades are being rehabilitated: new technologies, new product ranges, new processes are forcing the pace of these restructuring and rehabilitation programmes.

Developing countries after three decades of experimentation now appreciate better the importance of a science and technology support system. What facilitates the current transformations is that the overwhelming majority of developing countries have,

during the past few decades, expanded the population of their professional manpower at an exponential rate and they have established a considerable range of scientific and educational institutions and industries.

The capabilities of developing countries in Industry Related Services vary significantly from country to country. Most countries have established institutions and organisations that provide: financial, commercial, trading, transport, consulting, contracting and legal services. The service sector content of IRS is often limited to consulting and contracting services; often, these are not comprehensive.

Generally, developing countries have a negative trade balance in services: they resort to foreign IRS sources to complement their local supply. NIC's have greater attention to the development of their IRS; in particular, they have successfully managed the development of their consulting and contracting services. These countries have also taken measures to promote the export of these services.

In Part I the crucial importance of IRS to all countries was emphasized and the financial implications estimated. It was established beyond doubt that IRS services make significant and growing contributions to the economies of all states.

It remains to give some additional information on how critical this group of services is to developing countries. IRS are important because:

- they enable the community to identify and select useful investment opportunities;

- they enable the community to select technology appropriately;

- they enable the community to utilise local skills and resources rationally;

- they embody much of the technology involved in industrial production. Much of the technology required in industrial production is applied through the services enumerated in Tables I.1;

- IRS services are needed at various phases of the production cycle to improve performance of the plant, to upgrade and modify facilities, to undertake R&M and R&D.

- the cost of production is determined by the cost of these IRS services; importing these services makes them considerably more expensive;

- a sizeable proportion of the cost of a project is spent on these IRS services; if the services are imported it increases the foreign exchange burden on the country.

- they are essential to continuous updating of the industrial technology in the country. If they have to be imported and the firm cannot secure the necessary foreign exchange to pay for these services it has to operate below capacity, and in some cases, shut down.

On a macro level all countries need to develop relevant policies

concerning planning and implementation methods. Planning procedures and implementation methods have a far reaching impact on the development of technology and on economic efficiency in a country. Local consultancy expertise is the instrument for project implementation and in a manner that supports longer term goals.

On the micro level industrial plants require reliable and readily accessible technical advice and information. Planning and implementation of industrial projects requires close collaboration between consultants, contractors, equipment manufacturers, process engineers and researchers. The utilisation of national firms provides the management of an industrial plant with the required easy access to useful technical support and information. The local consulting firm would be a more effective and specialised link with international experts, equipment manufacturers and international R&D.

The UNIDO-A Report enumerates additional reasons concerning the importance of IRS to the establishment of a profitable industry or to self-sustaining industrial development.

Mexico is among the few developing countries that adopted positive policies of promoting IRS as an integral part of its export promotion policy. These policy changes were based on the belief by the Mexican Government that a strong producer service sector is an essential component in restructuring. [UNCTAD, Trade and Development Report, 1988, p. 205].

#### **.c. The Science and Technology System and the Place of Industry Related Services in the Network;**

Not only do Industry Related Services provide vital support in order that plants operate successfully but they also play a systemic role in the country: they provide the cross-linking and efficient mechanisms for dynamic articulation of various specialised institutions and firms responsible for economic activity. The articulation of the many economic activities in a country is practically impossible without the constant participation of national IRS.

It has been known for some time that the locomotive of any economy is its Science and Technology System (S&T-System) which consists of:

- Government organisations, laws, regulations, policies and procedures that influence planning, trade, standards, education, financial services, contracting public sector projects, statistics collection and publication, information services, etc;
- The financial system (including banking services);
- Universities;
- R&D institutions;
- Professional Associations and Societies;
- Consulting and contracting firms;
- Institutions setting and applying standards;

- Institutions providing continuing education;
- The legal system;
- Informaticn services (including libraries, publications).

**Science and Technology System** is central to any technical activity; to the development of national capabilities; to transferring, acquiring and accumulating technology. Being a system each part is articulated with, dependent upon, all the other parts. IRS are an integral part of this **System** and essentially provide the networking machinery that links and articulates the components to each other.

As importantly IRS, which are integral components of the **Science and Technology System** provide the means for integrating national firms with each other and the national economy. Without developing an effective **Science and Technology System** the country ends with a collection of expensive islands of industrial activity whose products have to be protected by high tariffs and non-tariff barriers. IRS cannot be developed without due consideration being given to the development of the **S&T-System** which provides the matrix within which IRS become rationalised: IRS services depend on a complex chain of other services.

A country that depends excessively on imported Industry Related Services ends by developing fragmented economy with each industry vertically integrated with external suppliers. The net result is that the industry fails to become competitive, does not act to stimulate economic growth, fails to generate technology change or to create employment.

A crucial component of technical and professional services are those consulting and contracting services necessary to plan and design new investment. These services may be supplied by national firms, they may be imported or may be supplied through joint-ventures between national and international firms.

When national firms participate in a substantive manner in the design and construction of a particular industry national IRS acquires part or all of the technology that goes into the new investment. National IRS is then able to supply additional services, when needed, during successive phases of the project. For example, IRS services are needed for: the optimisation of a plant, R&M, servicing during emergencies and accidents, adaptation of plant and processes to new technologies and or to the manufacturing of new products, the extension and updating of a plant, the improvement of production methods, the improvement of products, the design of new products, and routine servicing of facilities.

All of these services, and many others, are routinely required by an industrial firm. When, however, the firm has to be operated with the assistance of a constant supply of foreign expertise and manpower the added costs of imported services make production prohibitively expensive. Most developing countries cannot afford the foreign exchange requirements of the importation of these



services. This factor is often cited as a cause of low capacity utilisation of industrial plants in developing countries.

Thus, the contribution of possessing such IRS capabilities to the commercial and operational success of a project is far greater than their share of cost; and the participation of national IRS organisations is of paramount importance in the operational phase and R&M.

Though each industry is a separate legal and financial entity; yet, operationally, each industry depends for its efficient operations on a complex support system with which it exchanges products and services. Industry Related Services provide the linkages that network the economy. This networking establishes the matrix of the national science and technology system which serves to integrate industry with the labour force, professional societies, R&D, the educational system, international science.

#### **.c. IRS in Developing Countries: Market and Structure;**

The negotiations around the Uruguay Round revealed the inadequacy of information on services in developing countries. Nevertheless, it is possible to provide an informed account of the scale and of the state of IRS adequate for our purposes here. In Part I estimates have been presented concerning the scale of IRS activities globally with special emphasis on industrial countries.

Services that match the items listed in Table I.1 are available in almost all developing countries. However, in most of these countries the available services fall short of local demand and need. The challenges that these countries face is how to develop their existing services, and specially IRS, to become more effective and competitive. It is in this domain as will be shown later in Parts IV and V that UNIDO can play a strategic role.

In most developing countries there are large vertically integrated parastatals whose in-house departments provide a wide range of services. These services would normally fall under "industrial production" in national accounts. Firms that produce phosphates, cement, gravel and clay, petroleum, refining, minerals, all operate large transport fleets, catering services, in-house R&M services, printing and publishing and so on.

The statistical publications of developing countries do not generally distinguish between the different activities of their service sector. In its Trade and Development Report, 1988 UNCTAD estimated that the modal share of services in developing countries was between 45 and 55% of GDP. [op. cit. p. 194]. Most of the services fall under trade, transport, education, health and other consumer oriented services. Using these figures and the estimates of GDP quoted in Table I.4 the contribution of services amounts to GDP come up to \$1,677 billion. In the light of the above remarks concerning the limited degree to which outsourcing is practiced in developing countries the figure of

\$1,677 billion must be taken as an under-estimate.

**.c2. Expenditures on IRS;**

IRS expenditure in a country consists of four main components:

**.c2. (i) Expenditures on IRS to Implement New Investments;**

Gross Fixed Capital Formation may be analysed to compute the share of IRS in its implementation. This may be undertaken by assuming that a proportion of the expenditure of each component of GFCF was spent on IRS. For example, it is possible to estimate that about 10% of GFCF expenditure on housing and basic infrastructure is toward consulting and contracting services; by contrast, 20% or more of expenditures on chemical and industrial plants are towards IRS.

The GNP of all developing Countries was \$2,700 billions (for 1989), of which \$675 billion were toward GFCF. (World Bank statistics indicate that 25% of the GNP of developing countries is devoted to GFCF.) As a rough estimate one can assume that 15% of GFCF is towards IRS: this yields a figure of \$100 billion for the estimated requirement of consulting and contracting services.

A portion of these services are imported and another is locally generated. The ENR estimates may be taken to represent the imported part. In 1990 developing countries commissioned \$67.8 billion of contracting services and \$5.1 design services, totalling \$73 billion. These figures thus indicate that roughly 75% of the consulting and contracting services are imported. The extensive utilisation of national capabilities should not only reduce the foreign exchange content of projects, improve the economic performance of investments in later phases but it should contribute to the expansion of the economy through a higher multiplier factor associated with these investments. The requirements of developing countries for the services of international firms per project will decrease but the expansion of the national economies as a result of higher efficiency will increase their requirements for the services of international firms.

**.c2. The Market in Developing Countries for Consulting and Contracting Services;**

There are two major groups of consulting and contracting firms operating in the national markets of developing countries. International consultants and contractors sub-contract portions of their work loads. This complicates an assessment of their relative roles since there are no detailed and accurate figures on the extent of these activities. In the following we shall provide best estimates of the size of these markets for international contracting.

**.c3. The International Supply of Consulting and Contracting**

## Services;

Highly specialised consulting and contracting services is almost exclusively provided by international firms. An international firm means one that is operating outside his home base. Roughly, 90% of these firms are based in OECD countries the balance is the rest of the world.

There are no independent and reliable official figures concerning consulting and contracting activities. There has been a number of estimates for specific markets. The major source of information on international consulting and contracting are the annual surveys undertaken by the American periodical Engineering News Record (ENR).

ENR estimates are based on surveys that it undertakes through the mail of questionnaire sent to these firms. Not all firms respond. The survey aims to assess new value and geographic location of new contracts secured by the firm during the previous year. The responses are not verified and there is no information on subcontracting by the firm. The responses by the firm are processed and ENR enumerates the results by geographical area, by firm and by broad class of technology. The surveys that ENR undertakes on firms operating within the US are more detailed than those undertaken internationally.

Table II.1 shows how the top 200 international design firms shared the 1990 world market valued at \$8.8 billion. Thus, in 1990 49 "international firms" secured \$1.1 billion worth of contracts in the US. These international firms were: 8 British, 11 Canadians, 6 French, 5 German, 4 Dutch, 1 the Egyptian branch of a Lebanese firm (Dar al-Handasah), 14 others.

The income generated from international work for these firms varied considerably. The top 19 generated \$100 million or more of new contracts; the bottom 57 generated between \$3.8 and \$9.99 million.

The importance of income from international work to the total work load of the firm also varied considerably from firm to firm: from as low as 3% to as high as 100%. Eleven firms had 90% or more of their income generated from outside their home base; 11 generated between 80 and 89% of their load from overseas work. 61 firms generated 20% or less of their earnings from overseas work.

The 1990 level of international load in consulting services was roughly double the \$4,000 million market that prevailed during the 1983-88 period.

.c. Table II.1;

.c. How the Top 200 Design Firms Shared the World's 1990

## Market;

Nationality of firm	No. of firms	Billings \$ mil	ME, %	Asia, %	Africa, %	Europe, %	U.S., %	Canada, %	LA, %
American	71	3,728	56.0	40.3	20.0	62.9	0.0	78.5	37.1
Canadian	12	510	1.2	1.9	4.3	3.1	25.3	0	9.1
European	89	3,965	31.9	43.2	68.5	33.0	71.3	21.5	49.8
Japanese	15	285	1.4	8.8	3.7	0.4	0.1	0	2.6
All Other	13	341	9.5	5.7	3.6	0.5	3.3	0	1.4
All firms	200	8,828	100	100	100	100	100	100	100

Source: ENR, 19 August, 1991

The level of international contracting was \$108.3 billion in 1980, increased to \$134.4 billion in 1981, declined to \$73.9 billion in the two years 1986-7 and began to increase since then reaching \$120 billion in 1990.

The proportions of national capabilities that are exported varies from year to year and country to country. Furthermore, there are some areas that are more international than others; for example, the oil and gas industry, power generation and the chemical industry are very international in character. In all of these cases the size of individual projects is usually large and the annual number of new projects is small. This is a condition that forces firms to operate globally; otherwise it is impossible for the firm to sustain its work load from year to year.

In 1990 the largest international market was Europe with \$30.45 billion, followed by Asia \$27.07 billion, the Middle East \$ 19.89 billion, Africa \$15.22 billion, USA \$15.31 billion of new contracts. A third of contracts were for petroleum refineries and chemical plants, general building accounted for 17%, transportation projects for 12%, industrial and manufacturing plants for 17%, power for 5%.

Under "other" contractors one finds contractors from developing countries such as Korea, Lebanon, and others: these account for only 5% of the total market during that year.

.c. Table II.2;

.c. How the Top 250 International Contractors Shared the World's 1990 Market;

Nationality of firm	No. of firms	Billions \$ mil	ME, %	Asia, %	Africa, %	Europe, %	U.S., %	Canada, %	LA, %
American	63	43,614	51.0	34.0	36.9	43.8	0	49.8	34.3
Canadian	8	1,327	0.2	1.4	0.8	0.3	3.7	0	2.7
European	108	51,915	37.5	22.5	48.6	49.9	64.0	49.4	48.4
Japanese	32	16,828	6.6	34.2	6.9	4.4	21.3	0.4	10.2
Turkish	6	531	.0	0	2.3	0.6	0	0	0
All Other	33	6,041	4.7	7.9	4.6	1.1	10.9	0.4	4.4
All firms	250	120,257	100	100	100	100	100	100	100

Source: ENR, 22 July, 1991

The size of these international contractors covers a very wide spread: from the giants who acquire more than \$10 billion worth of new contracts annually (lead in 1990 by Fluor Daniel with \$18 billion intake of new work) down to Petrolinvest of Sarajevo with a total load of \$2 million of which \$1 million was foreign.

### .c3. International Competition for Consulting and Contracting Services;

International firms enjoy a wide range of facilities and support by their respective governments; the corresponding firms in developing countries do not enjoy similar support. These advantages are: access to sophisticated and extensive financial services, insurance cover by their government for contracts, a wide variety of insurance services to cover a variety of standard contingencies, financial services and devices to assist them in overcoming changes in exchange rates, information and advisory services provided by government services (such as the ministries of commerce and the foreign office). These advantages are over and above those generated by the large size of these giant firms: many of them have annual turnovers larger than the GNP's of many of their clients. Finally, all of the industrial countries have sophisticated professional societies which provides these institutions with a stable and solid matrix within which they can work; this is specially important for setting up professional standards of performance and access to professional information.

IRS firms in developing countries generally lack most to all of this range of services. They make up for some of these disadvantages partly by knowing their local market well and partly by a lower overhead cost for operations in developing

countries. However, for large contracts as well as for complex industrial contracts IRS firms in developing countries are completely out of the game: it is here that the advantages of financial services, access to R&D services and to belonging to an established scientific community makes a major difference.

Yet, the fact that IRS firms in industrial countries possess more advanced capabilities and more extensive support than those in developing countries need not reduce the usefulness of IRS firms in developing countries or undermine the feasibility of effective technology transfer between the two parties. In general, the two parties found ways to combine their resources to undertake high quality work that resulted in lower cost and in technology transfer. International firms have been an important source of technology to firms in developing countries through various mechanisms: sub-contracting, joint ventures and project management (Zahlan, 1991).

The main area of competition between IRS of industrial countries and these with IRS from developing countries is in the markets of the developing. Eighty to 90 % of the competition in the international market for construction and design services occurs in NIC's and LDC's. Industrial countries balance their imports and exports of this type of services. However, developing countries have generally failed to optimise on their relationship with international firms.

The experience of the post World War II period indicates that it should be possible to find conditions under which these various firms can cooperate constructively to their mutual benefits. Doing so depends to a considerable extent on the policies of developing countries. Developing countries have to adopt the necessary measures through which national firms can compete on an equal basis in their home market and can participate effectively in technology transfer. The measures that have to be adopted are often neither costly nor complex: in fact with good planning developing countries may be able to accelerate the rate of technology transfer and reduce the cost of projects implemented in their countries.

The estimate of ENR for 1990 assumes a larger GFCF for subsequent years. However, it appears from this very rough analysis that the bulk of IRS services that goes into implementing investment plans in developing countries are imported. Nevertheless, it is noted that the sums under discussion are substantial.

#### .c2.(ii) The Share of IRS in Industrial Output;

It was shown in Part I that the requirements of IRS in the post-investment phases is five times larger than the requirements during the investment phase. It was also argued that the economies of developing countries does not have adequate supply of IRS and cannot afford, except for a select few, to import these services.

UNCTAD's data on trade in services are not disaggregated and it

is not possible to estimate the IRS content accurately. Between 1970 and 1990 the import of services by developing countries and territories increased from \$26,382 billion to \$299,493. In 1990 this figure included: \$55.7 billion for insurance and freight, \$87.8 billion towards interest payments and \$18.8 billion as income from direct investment. Thus the IRS content of debit in trade in services does not exceed \$137 billion.

\$137 billion is an upper limit on the value of imported IRS; by contrast according to Table I.4 developing countries required in 1990 some \$460 billion in IRS to operate their investments "optimally" -- that is according to the specified assumptions. Some local inputs are, of course, made but on the whole the economies of these countries operate below capacity because they are unable to cover the foreign exchange cost of IRS imports nor do they generate IRS locally.

UNIDO's Global Report for 1992/93 finds that Indonesia, Japan, Malaysia and the Republic of Korea show a sharp increase in dependency ratios of producer services in these countries between 1975 and 1985 [ Industry and Development, *op.cit.*, Table III.15, p.147]. A few oil producing countries (such as the GCC countries) generated sufficient income that enabled them to import most of their needs of IRS and thus to operate their economy at a high level of technical efficiency.

An important conclusion can be made from Table I.4 and from the above estimates: there is a considerable shortage of IRS in developing countries. The purpose of this Report is to draw attention to this shortage and to propose feasible measures that UNIDO could adopt for correcting it.

#### .c2.(iii) Exported IRS Services;

Some developing countries are exporters of IRS services. Detailed data on these exports are not easily available but an estimate of \$10 billion annually may be guessed from ENR statistics. This is, obviously, still a small amount.

#### .c2.(iv) Workers Remittances;

Remittances by expatriate labour constitute substantial sums of money and these remittances are for services rendered. Expatriate workers provide a wide range of services, including: teaching, medical, catering, accounting, cleaning, technical, engineering and others. These remittances were in 1989 for selected countries: Egypt (\$4,257) millions; Jordan (\$627); Syria (\$ 355); Yemen (\$438); ....

The remittances of expatriate workers are often substantial; for example in the case of Egypt remittances are twice Egypt's expenditure on the import of services.

#### .c.Illustrative Examples in Selected Areas;

IRS services in each region of the world reflect the cultural, economic and technological conditions in that particular region. Although the flows of technology are primarily from North to South there are special scientific and technical developments in many regions of the developing that can be usefully transferred from region to region.

This is particularly so in the domain of small scale agricultural machinery where South Asian countries have made special effort, in the areas of medical sciences Chinese and Indian medical sciences could make significant contributions. The development of IRS in each region should enhance the capacity of each region to export its comparative advantages.

We shall present illustrative information on IRS imports in different regions of the world.

#### **.c. The Arab Countries;**

According to UNIDO-A (p.67 and quoting UNCTAD Handbook of International Trade and Development Statistics 1988) the import of the Arab states of services totalled \$35,769.40 million (some 10.6% of Arab GDP) and this figure does not include imports of: UAE, Qatar and Lebanon. The first two are heavy importers of services. It is interesting to note that the import of services was more than 143.6% higher than the import of capital goods. By contrast, imports of services by USA, Japan and the EEC as a percentage of their GDP was in the same year: 1.6, 2.2, 4.3 respectively.

The largest importer of services among the Arab countries is Saudi Arabia (\$19.3 billion, 16.3% of GDP, 251% of capital goods imports); but even such the least developed among them are relatively substantial importers: Mauritania (\$202 million, 174% of capital goods imports); North Yemen (\$271.1 million, 140.5%); South Yemen (\$202 million, 270%); Somalia (\$101.8 million, 82%); Sudan (\$229 million, 79.8%) all for 1987.

[ Information on the importation of IRS by Arab countries is available in UNIDO-A pp. 64ff]

#### **.c. Latin America;**

The 1988 UNCTAD Report [op.cit.p. 196] states that most Latin American countries have surpluses in goods and large and increasing deficits in services.

Detailed statistics on the import of IRS is very fragmentary. The UNCTAD Report cites that a study of the foreign debt (\$12 billion in 1989) of Peru showed that 12% of the total corresponded to consulting services tied to foreign loans. [op.cit. pp.200-1]. The Report goes on to say: "Furthermore, the value of such imports would appear underestimated; they are often tied to financial packages and not recorded as trade in services at all, but rather reported as payments on factor services or (as in the



case of consultancy, engineering and technical services linked to imports of capital goods) as imports of capital goods."

**.c.Africa ;**

The 1988 UNCAD Report [op.cit. pp. 196 ff] states that the African region is highly dependent on imports of services. It cited Gabon, Congo, Cote d'Ivoire, Zaire, Cameroon, Zambia as having devoted 45% of their foreign exchange to imports of services. Although African countries had a positive trade balance in merchandise \$20.2 billion in 1980 and \$5.3 billion in 1986 they incurred a heavy trade balance in services: -\$13.1 billion in 1980 and -\$6.0 in 1986. Their net current account balance was -\$10.8 billion in 1986.s

**.c.Part III;**

**.c.Implications of the Present Underdeveloped State of IRS to Developing Countries;**

The increase of participation of developing countries in the international economy depends on their ability to compete and on their capacity to adopt and adapt technological innovations. Industry Related Services are essential instruments to achieve these objectives. Weak IRS is immediately reflected in an inability to compete and in a decline in industrial output as international competition increases. Since IRS are essential to the adoption and adaptation of new technology the country is further penalised by its weak IRS base.

Foreign IRS is of limited value since most countries lack the financial means to cover the cost of importation. International aid is limited in scope and is barely enough to catalyse economic development. In Part I it was shown that the absorptive capacity of developing countries for technology is itself contingent on national IRS. In other words, developing countries cannot apply their own national energies to overcome their economic under-development without taking measures to develop national IRS.

Part III is concerned with the negative consequences of shortages in national IRS; Part IV will be concerned with the many opportunities available to developing countries to alleviate this negative situation.

#### **.c. IRS and Employment Creation in Developing Countries;**

It is generally accepted that job creation in all regions of the world has considerable priority. The pursuit of policies that promote the emergence and development of efficient IRS combined with outsourcing by major industrial firms can be shown to be an important instrument in the process of job creation. Thus the weakness of IRS in a country obstructs the process of job creation .

#### **.c2. IRS and Opportunities for Parastatals to Initiate Large Scale Development;**

Many large parastatals and private firms have been established in developing countries over the past three or four decades. At the time of their establishment IRS services in these countries were either weak or non-existent; the new organisations were designed to be self-sufficient. The new firms established in-house a number of non-core services that they needed to perform their tasks. These in-house services may not be fully utilised; thus the firm is incurring a high cost for the maintenance of in-house services. This is similar to the situation that prevailed among firms in OECD countries who in the face of severe competition resorted to outsourcing as a way of reducing the cost of production.

The market for IRS provided by large firms in the developing constitutes a large and significant proportion of the total national market. Thus, its being locked into a self-contained firm makes it very difficult, if not impossible, for the

emergence of similar IRS for the rest of the economy.

Each one of the non-core functions and services now locked into a major firm or parastatal can be externalised and these externalised services can then offer these same services to small firms that currently do not enjoy access to such inputs. Such inputs should improve the quality of their work and their productivity.

What is important to emphasise here is that this process of externalisation through the provision of key services to small and medium scale firms will enhance their output and performance, increase capacity utilisation, increase employment in the firms of their clients and also increase employment in IRS firms. The alternative, maintaining the in-house state of affairs locks the economy in its present crises.

#### **.c2.The Development of Small IRS Firms;**

All activities in industrial economies are now structured in a hierarchical manner. Large firms provide the framework that structures the industry but when it comes to actual production a great deal of the work is subcontracted to a large number of small firms. These small firms are generally efficient because they have a minimum of bureaucracy: the staff are skilled workers that need a minimum of supervision.

For example, some 50% or more of all construction work in industrial countries is undertaken by relatively small (employing less than 10 workers) consulting and contracting firms. Furthermore, of the one million contractors in the U.S. less than 5% have 20 or more workers. The large firms with turnover equal to \$40 million or more account for 30% of construction only. But what is very important to stress here is the high level of sub-contracting practiced by all large firms: ranging from 53% in residential buildings to 20% in heavy construction. [Robert G. Eccles, "Bureaucratic versus Craft Administration: The Relationship of Market Structure to the Construction Firm," in ASQ Quarterly 26, pp. 449-469, (1981)]

Comparable size firms in LDCs are unable to provide similar quality services. A major reason for this difference is that the small firms in developing countries do not have ready and easy access to the inputs normally provided in industrial countries by service industries; such as: training, know how; equipment rent; advisory services concerning the use of supplies; financial services, transport services, insurance, quality control and testing laboratory facilities all at reasonable cost.

The continued locking up in parastatals and large firms of specialised high quality IRS undermines any effort to establish a movement in favour of the creation of small firms.

#### **.c2.Absorption of Financial Assistance;**

Many LDCs have been unable to absorb the financial assistance that they have been awarded: the backlog in some countries is equivalent to two or three years of aid funds. David Housego estimated that India had "a pipeline of committed but unused funds of \$13 billion" in 1990. ["Decline in donor generosity falls at a bad time for India," Financial Times, April 27, 1990]. During 1990 Bangladesh spent only 13% of the \$5.4 billion of aid already in the pipeline. [David Housego, "World Bank chief visits Bangladesh to ease strains over policy," Financial Times, April 9, 1990]. These two countries are not an exception: furthermore, bilateral aid meets similar problems.

Thus UNDP's policy of promoting the policy of Country Execution of UNDP supported projects is obstructed by the weakness of IRS in the recipient countries. The removal of the deep seated institutional barriers to the expansion of IRS services is of strategic importance to the development process.

A major factor in this lack of absorptive capacity is limited IRS capabilities.

#### .c2. A Small Missing Inputs & a Large Loss of Opportunities;

Developing countries often require specialised assistance to enable them to utilise their resources fully. They may often have 80 to 90% of what it takes to undertake a particular project but because they lack key inputs in project management, technology or otherwise they are unable to mobilise and apply their rather extensive resources. In other words, possessing 80 or 90% of the required capabilities to perform a particular task are of no use because these organisations are unable to co-opt the missing 10 to 20%.

Consequently, failing to supply the missing inputs governments and/or the private client resort to 100% foreign technical services. The examples that have been studied illustrate the feasibility of making the required inputs to enable a country to benefit from the consequent increase in national capabilities.

Obviously the only demonstration that can be made to emphasize the importance of providing the "missing inputs" is by examining counter-examples.

For illustrative purposes it is possible to cite the experience of a few cases. GTP (formerly: ULTRA) - an Algerian contracting firm - pursued a policy of co-opting expatriates to fill gaps in its capabilities. This policy enabled GTP to utilise Algerian manpower resources -- supported by a few expatriates -- to design and construct complex gas pipelines, ~~and~~ by bringing in lots of the man-  
power for the equipment.

EGITALEC in Egypt was formed as a joint venture between Egyptian and Italian firms to supply technical services in Egypt and the region: the Italian partners supply the missing inputs and the firm has been eminently successful in its mission. Local resources and equipment specifications enabled EGITALEC to receive 20 percent of the capital cost by a 100% local supply of the capital cost. The success of EGITALEC is a result of the local resources and equipment specifications.

The example of FINEP (founded in 1967) in Brazil, is different because it identified that financing was the bottle neck in the technological development of Brazil. FINEP was dedicated to providing the financial input to enable Brazilian scientists, entrepreneurs and firms all the way from the R&D stage to industrialisation. By 1989 FINEP had financed 10,890 projects to the tune of \$5.8 billion. The provision of these inputs led to the establishment of some 200 firms in engineering consultancy with a \$1 billion annual turnover; the development of the first vaccine against leishmaniosis, and countless other dramatic developments.

#### **.c2.Export of Jobs;**

The improvement of communication and transport technologies has reduced the barrier to the migration of jobs. The trend to delocalise the place of conducting services and manufacturing is already widespread. Sub-contracting in manufacturing is well established. However, the export of jobs in the service sector is increasing.

Jobs are being transferred across international boundaries through modems. The importance of these trends to IRS are evident: a great deal of professional services involving editing, translation, publishing, printing, accounting, the paper part of administrative services, engineering design, procurement, programming, computer inputting of data, and many others may be performed at any geographic location. The key elements are quality and competitiveness. Thus countries that are unable to compete will find that the few jobs that they had in the service sector are disappearing down the telephone line.

#### **.c2.Missing Linkages;**

Many developing countries have been unable to construct a Science and Technology System to enable them integrate the operations of large and small firms into the general economy. The main reason for this weakness is the absence of IRS that mediate and facilitate networking and the development of the requisite relations and transactions between industrial organisations and the rest of the economy.

This can be seen in the areas of management and finance, insurance, marketing and product design, advertising, consulting and contracting, cooperation with other firms in import and exports, shipping and transport. In the years ahead, the continuation of such a state of affairs is likely to lead to increasing hardships and the likely collapse of more and more developing economies.

**.c.Part IV;**

**.c.Prospects for the Development of IRS in Developing Countries;**

**.c.Introduction;**

Part IV of the Report reviews briefly the factors that influence the prospects for the successful and speedy development of IRS services: naturally, UNIDO's strategy has been conditional on the feasibility of such development.

**.c.Shortcomings and Challenges facing IRS in Developing Countries;**

We shall summarise here briefly the relevant findings of this Report in order to place the discussion of the prospects in perspective. The share of services in the GNP of developing countries is comparable to that of industrial countries. Services are as important in developing countries as in industrial countries. IRS are important instruments for development, employment and technology transfer.

Practically all of the services listed in Table I.1 are, in principle, available in some form or other in developing countries: however, the characteristics of the services fall short of what is required by industry. For example, banking and financial services are available; yet, these are not available to finance consulting and contracting firms on the basis of their work load. A firm may secure financing for a project if it can provide sufficient collaterals to the bank and not on the basis of the intrinsic value of the activity. Furthermore, long term project financing is not readily available.

Although consulting and contracting firms do exist in most countries we have seen that these do not operate in a framework within which they can efficiently acquire and accumulate technology. The modification of this framework is feasible.

The concentration of presently available IRS is in the area of civil engineering where the technology is less complex and the requirements of project management are less demanding than in engineering design and industrial construction. Even in the domain of civil engineering national consulting and contracting

firms specialise in small scale projects: consulting and contracting firms are generally weak when it comes to project management, financial management, inventory and procurement and quality control. All of these competences can be readily developed given reasonable public policies concerning the scheduling of public sector projects and technology.

A major hurdle in the way of consulting and contracting firms from developing countries is the size of projects: some governments in developing countries lack the capabilities for managing projects and in order to simplify their administrative problems they tend to bundle projects together to constitute packages whose size is far beyond the financial and managerial resources of national firms. Many of these projects can be broken down into smaller units that can be handled by national firms.

Another hurdle is the fact that the public sector places on the market a large number of projects simultaneously rather than schedules its programmes over a reasonable period of time to facilitate local participation and the transfer of technology from international firms. Public sector projects are rarely of such urgency; very often these projects could be better scheduled to match local capabilities. It is reasonable to expect that better planning could readily result in better scheduling of projects.

The liberalisation of trade in services may result in considerable dislocations in the economies of developing countries unless these countries take serious measures to rationalise their services.

Services are still fragmented into non-articulated components:

- services produced and consumed by the civilian private sector;
- services produced by the public sector;
- services produced in-house by parastatals and large firms;
- services imported by both the private and public sectors.

Transactions between these different sources of services is limited. A consequence of this compartmentalization of the different sources of supplies of services is a limitation on the opportunities available to each firm to expand and to develop its capabilities; furthermore, there is a reduction in the opportunities for technology transfer specially between international firms and local firms as well as between in-house services of major national organisations and independent suppliers of services. Thus, the articulation of different suppliers of services is inadequate and could be better managed through improvements in the environment of such services.

The development of policies and procedures for articulating these different activities presents opportunities to UNIDO. UNIDO is uniquely placed to provide developing countries with:

- policy advice;

- concrete models to examine;
- sophisticated training programmes to assist senior government officials to simulate of alternative forms of industrial organisation;
- as well as assistance to countries to develop statistical data basis;
- provide expertise and training to assist governments to analyse economic data on the service sector.

**.c. Instruments for Development: the Major Players in the Market;**

Developing countries have access to a number of sources of assistance for planning and implementing their development programmes. These cover a complex and wide spectrum ranging from the use of national, international and foreign institutions for planning and implementing.

Various combinations of these instruments are currently utilised. The relationships between these different instruments is constantly changing reflecting the changes in objectives, experiences, economics, technologies and concern of developing countries. The efficiency of a national economy depends on its capacity to utilise its national resources optimally. Expanding this capacity is one of the critical objectives of both the governments and of UN agencies. UNIDO's could assist developing countries to utilise available sources more effectively and economically.

**.c.Determinants of Prospects of Developing Countries;**

The determinants of developing Industry Related Services in developing countries are:

- the availability of professional manpower;
- policies and procedures for the promotion of a national Science and Technology System ;
- policies and procedures for the promotion of national consulting and contracting organisations;
- an environment conducive to outsourcing services by the dominant parastatals and large private firms;
- the availability of know-how on how to establish and develop IRS.

Each of the above factors can make significant contributions to the acceleration or retardation of the emergence and evolution of IRS in a particular country.

**.c2.Availability of Professional Manpower;**

Developing countries have invested heavily in the human resource development: they expanded by a factor of 10 their professional manpower, they have built extensive range of universities and secondary schools. Most of these countries have already established R&D centers of various types. Professional organisations and unions also exist in most of them. There is, of course, a wide spread dissatisfaction with the scale and quality of the educational process and of research activity.



Nevertheless, there is already a substantial base to move from.

The importance of high level manpower to development is well known. What is less well known is that most developing countries have accumulated during the past three decades substantial numbers of professional manpower. The brain drain from developing countries attests to the abundance of their professional manpower. Although, developing countries have a long way to go before all their manpower is properly and effectively educated they have already reached a state where the shortage of manpower is no longer a deterrent to growth.

The most difficult challenge that most developing countries now face is how to establish effective and productive institutions to mobilise available professional to useful ends. In the international literature there is constant discussion of "institution building". The evolution of IRS provides a mechanism for promoting institution building because these organisations are usually relatively small, performance oriented and can contribute to problem solving.

At the present time most developing countries lack the suitable institutional arrangements required to articulate policies, programmes, institutions, financial facilities, legal framework, planning and foreign assistance. In other word, much can be done to facilitate the development of an environment in which professionals can establish IRS.

#### **.c.Policies and Procedures for the Promotion of a National Science and Technology System;**

A great deal of information and expertise is available on this subject. UNESCO and various other UN agencies have been involved in assisting developing countries in this sphere: unfortunately, the contributions of these different agencies has been piece meal and there is considerable scope for cooperation among the agencies to provide a more coherent and effective input.

#### **.c2. Policies and Procedures for the Promotion of National Consulting and Contracting Organisations;**

The prospect of developing national IRS can be enhanced by the promotion of consulting and contracting services. As already mentioned elsewhere in this Report these two services play a critical role in the promotion of national economic integration through the integrative services that they undertake. Both types of firms have to sub-contract extensively and thus automatically promote other IRS.

The promotion of the development of local services through the appropriate of technology policies is feasible and is a practice that has been attempted successfully in numerous countries. The obstacles that slow the development of national consulting and contracting are reasonably well known and governments, if they so wish, can remove these obstacles in a planned manner.

**.c2.Environment Conducive to Outsourcing Services by the Dominant Parastatals and Large Private Firms;**

The environment is the result of a complex interaction between business practices, legal system, economic and technological conditions. The evolution of these different parts of the environment has been disjointed in most developing countries. Most developing countries have still to put in place suitable systems to manage the emerging complexity of their economies and the consequent social organisations. They have to develop substantial expertise in project management and the management of complexity; it being agreed that the management of complexity is a challenge to all countries. The prospects for a successful attainment of such an objective is contingent on the capacity to develop IRS: for these are the components which a society and country needs to evolve a system of management.

One of the difficulties encountered when promoting the development of IRS arises because both the private and public sectors have been, during the past several decades, oriented towards isolation from their immediate environment.

Thus most of private and public sector planning and implementation has been oriented towards the excessive use of foreign services. National planning methods have favoured the development of large and self contained industrial complexes. These industrial complexes have generally been positioned as islands in a national economy with which they had little contact.

The persistence of modern and traditional sectors side by side with little tendency for the borders between them to become eroded is a visible state of affairs in most developing countries.

**.c2.Availability of Know-How on how to Establish and Develop IRS;**

Although a great deal has been written, published and discussed in general terms concerning the experiences of different countries these experiences are often not available in formats that makes them useful to planners and decision makers.

The flow of available information concerning specific skills, policy planning and formation is still under-developed; inadequate resources are committed to this objective. Given the enormous advances in electronic information systems it should be possible for UN-organisations to make significant contributions to reducing the remaining barriers in the way of low cost information flows to and from developing countries.

**.c. Part V;**

**.c. Recommendations;**

**.c. Introduction;**

The analysis and assessment of the importance of Industry Related Services to the economic performance of developing countries has shown that:

- there is a market for pre- to post-investment Industry Related Services in developing countries worth about \$ 600 billion annually;

- at present, developing countries import IRS services connected with investment at the rate of \$75 to \$100 billion annually.

It was shown that developing countries, however, cannot sustain the purchase of all the Industry Related Services required to operate their economy at an optimal level. A small number of countries who are either NIC's, and have developed substantial IRS, or have access to substantial oil revenues and are able to finance the import their IRS requirements.

The expansion of local IRS could make substantial contributions to the national economy through the services to small and medium size firms. These small and medium size firms could make significant contributions to the expansion of employment and the generation of savings in foreign exchange.

Though the development of IRS require a liberal trade regime they cannot be expected to grow spontaneously as a result of market forces. The actions of governments, professional organisations and of international organisations are essential to the establishment of a suitable environment that stimulates their growth.

In the following a set of strategic recommendations are presented to achieve such an objective.

**.c. Recommendations;**

The nature and significance of IRS and the associated challenges and opportunities have been detailed in Parts I to IV of this Report. What remains is to present specific recommendations and to translate these recommendations into a plan of action. *and discuss technical assistance programmes*

**.c2.(i) Recommendations Concerned with the Establishment of a Favourable Environment for the Promotion of IRS;**

The development of IRS requires the establishment of a favourable local environment. It is recommended that the following measures be adopted:

1. Revision of system and procedures of public procurement with a view to: improve communication with national firms, facilitate the process of meeting pre-qualification standards, scheduling of programmes and projects, breaking large projects into smaller units to enable national firms to participate and promoting sub-contracting by foreign contractors.

2. Development of financial services to support national IRS firms: fiscal incentives and better access to finance are an essential part of an environment that stimulates IRS. Fiscal incentives can take many forms: tax relief, carry forward of losses, reduced tariffs on import of technologies that enhance their work. One of the most important improvements is to modify regulations as to the requirements of collaterals. Industrial loans to investors could be tied with respect to the use of national IRS when available. The Government in collaboration with independent professional associations should establish criteria and standards concerning national IRS: to both protect competent ones from the negative impact of charlatans and also to give regulations a sound bases in law.

3. Externalisation of IRS services now provided in-house by parastatals and public departments:

4. Establishment of a system of procedures for pre-qualifying and pre-selecting consulting and contracting firms:

- the establishment of procedures to assist national firms to assess their capabilities and to define the national capabilities that they require for undertaking a broader range of services.

- the establishment a data base and a national service to assist national IRS firms to identify personnel, at home or abroad , that could enable it to secure additional work by enabling the firm to meet higher standards of pre-qualification.

5. Modernisation of incorporation and registration laws and regulations concerning IRS:

6. The promotion of networking of organisations and institutions: networking to be undertaken within the framework of a national S&T-System. Professional associations, the chambers of commerce and industry, publishers, public institutions should endeavour to compile annual directories on organisations, institutions, IRS to enable consumers of services to establish effective communication.

7. Information Gathering: Information sources in developing countries are generally poor on both local and international subjects. Although access to international sources of information

can alleviate the shortage of information on international subjects there is no substitute to developing national information sources on local subjects. Access to reliable, efficient, thorough and comprehensive sources of information is of considerable importance. It is recommended that reliable, comprehensive and timely information on the national economy be generated and published. The development of a wide range of library and information services should be a prime objective of all ministries and governmental organisations.

**.c2.(ii) Recommendations Concerned with Professional Associations;**

It is recommended that considerable effort be made to promote the formation of national professional associations in the social, engineering and scientific fields. These associations contribute important services through the networking of professionals from different organisations. Professional associations and societies can play an important role by providing platforms for the diffusion of information to members of the profession and to society at large.

IRS depend to considerable extent on the support of high quality professional associations for new ideas, training, professional standards, communication channels, advisory services and introductions to international organisations when the need arises.

Developing countries lack the presence of authoritative bodies to express professional opinion on issues that challenge society. It is strongly recommended that existing associations be strengthened.

It is recommended that professional associations be supported in order that:

1. They prepare annual informative directories of their members and assessments on the standing of the profession in the country;
2. They maintain data bases on their membership which could enable IRS to locate promptly specialised manpower when needed;
3. They provide an arena where IRS interact with members of the profession to discuss technical issues of national importance;
4. They sponsor national and international conferences in their field of expertise;
5. Encourage government and the private sector to utilise national IRS in their field of expertise;
6. They sponsor regular and independent surveys of technologies and scientific developments that are of national importance with a view to eliciting public and professional interest;

7. They participate in the drawing up and/or debate performance standards and codes of conduct;
8. They act as publicly spirited lobbies of ideas and policies of public interest;
9. They publish periodicals and monographs on topics of professional importance;
10. They become affiliated with regional and international organisations of similar interest.

**.c2.(iii) Recommendations Concerned with Enterprises;**

It is recommended that associations of enterprises producing similar services and products be established. Although these enterprises are often competitors they still have much in common and could collectively benefit if local IRS improves in quality and effectiveness. These enterprises may have common problems with consultants, contractors, government, consumers, exporters, importers, financial institutions and others.

It is to be expected that these enterprises should be able to support active and effective organisations.

**.c2.(iv) Recommendations Concerned with Parastatals;**

A considerable amount of industrial investment in developing countries is by governments. It was estimated that these public and/or mixed private-public sector firms can play a considerable role in the development of IRS in their respective countries through their adoption of outsourcing policies. It is recommended that all governments that are undertaking to restructure and/or to rehabilitate an industry

**.c2.(v) Recommendations Concerned with Sectoral Organisation;**

1. Revision of system of taxation with a view to promoting technology acquisition, improvement of standards, enhancement of exports, staff training.
2. Establishment of a special fund to provide credit and guarantees to firms seeking to enhance their technological expertise, penetrate new markets, adopt new processes and products.
3. Revision of system of regulations and facilities that manage foreign firms with a view to promoting the utilisation of local IRS.
4. Establishment and/or improvement of sectorial information services with a view to promoting networking and sub-contracting.
5. Expansion of opportunities for foreign travel in order that national IRS firms became better acquainted with international

development in this industry.

**.c2.(vi) Recommendations Concerned with Training in Modern Methods of Technology Management;**

The following group of recommendations should be aimed at the top professional levels in the country and should be available to professionals in the private and public sector. The objective is to make available to each developing country the tools that are essential to manage modern technology and technology change.

1. Expand opportunities for training in corporate management. This can be accomplished through the development of national educational institutions and professional associations.
2. Expand opportunities for training in project management. This can be accomplished through the development of national educational institutions and professional associations.
3. Expand opportunities for training in system management on the sectorial level. This can be accomplished through the development of national educational institutions and professional associations.
4. Expand opportunities for training in selecting, adapting, adopting and installing management systems to operate industrial operations. This can be accomplished through the IRS associations.
5. Expand opportunities for training in technology assesstment. This can be accomplished through the development of specialised programmes within existing national research institutions or ministries.
6. Developing governmental guidelines for evaluating IRS firms.

**.c2.(vii) Recommendations Concerned with Training in Modern Business Organisation and Promotion;**

1. Expand opportunities for training in business management. This can be accomplished through the development of national educational institutions and professional associations.
2. Expand opportunities for training in marketing. This can be accomplished through the development of national educational institutions and professional associations.
3. Expand opportunities for training in negotiation. This can be accomplished through the development of national educational institutions and professional associations.
4. Expand opportunities for training in accessing international business information. This can be accomplished through the development of IRS associations and the chambers of commerce and industry.

5. Provide information on existing directories, international regulations, international institutions that govern international trade could be of extreme importance and usefulness to entrepreneurs and government officials involved in all aspects of trade and business transactions. Expertise in, and information on, these matters is generally limited in most developing countries. The promotion of specialised professional organisations (legal, financial, technical, trading) in these areas should have important impact on the selection of products and services for import and export.

6. Expand opportunities for training in international business operations:

such training to include understanding the operations of MNE, the working and operations of GATT, FIDIC and all other institutions when relevant.

**.c2.(viii) Recommendations Concerning the Undertaking of Systematic Reviews and Evaluation of Implemented Programmes;**

The development of a range of activities of the scope and complexity envisaged in this Report requires regular and systematic evaluation of the effectiveness of the methods adopted, the undertaking of comparative studies of the performance of policies concerning IRS in different countries, the assessment of the effectiveness of adopted incentives and disincentives.

It is recommended that a substantial programme undertaken by a variety of official and independent organisations carry out this recommended annual evaluation.

**.c.Translation of Recommendations into Plan of Action: UNIDO's Action Plan for IRS development.**

An Action Plan based on the Report and the above Recommendations may now be presented. The Action Plan is in two parts: the first one is targeted at country level and the second is targeted on the regional, sub-regional and international levels.

**.c.Country Level;**

UNIDO could consider developing a broad range of low cost and high quality services of the following type:

**.c2.Technical Assistance at Policy and Institutional Level;**

1. UNIDO, alone and/or in collaboration with other UN organisations, to contribute to the development of facilities, data bases, institutions and the organisations of studies and conferences with a view to the promotion of networking of professionals, professional associations, enterprises and institutions. The output of this collaboration to consist of useful directories, data bases, networks and studies.



2. UNIDO to assist developing countries to undertake annual surveys to assess national resources and capabilities in IRS and also to identify obstacles and difficulties in the path of their development.

3. UNIDO to assist developing countries to improve coverage, timeliness and comprehensiveness of national statistical information gathering and publishing. The output of this assistance to consist in improved statistical publications on IRS and industrial performance.

4. UNIDO to contribute to the development of access by professionals in developing countries to international information. The existence of modern computers should facilitates this task and should reduce cost.

5. UNIDO to promote national capabilities in policy formation. The management of complexity has been identified as an important area that has relevance to the development of IRS and the economy. The development of the environment for IRS calls for improvement in the management of technology and in its articulation with all other national sub-systems. UNIDO to provide its assistance through the organisation of conferences, workshops, studies, training, sponsorship of research into policy making and publication.

The development of these national capabilities may require UNIDO to sponsor research programmes on the national and regional levels on:

5.1 the relationships between standards, quality control, project management and the performance of the economy, technology transfer and the evolution of national IRS;

5.2 the economics of establishing institutions and the required procedures for maintaining standards and quality control;

5.3 the relationship between local marketing and exports and the maintenance of standards;

5.4 the relationships between prevailing standards, quality control of services and the rate of evolution of IRS.

6. UNIDO to assist national governments in scheduling public sector programmes and projects with a view to enhancing the optimal utilisation and development of national IRS. This recommendation aims to assist governments to schedule programmes in such a way as to avoid bunching of projects and also to break down large projects into sub-projects that can be handled effectively by national firms.

7. UNIDO to assist national governments to articulate educational and training programmes with the requirements of IRS and of industrial development. This recommendation aims to bridge the gap between different ministries with a view to integrate complementary activities.

8. UNIDO to cooperate with professional associations with a view

to developing suitable specialised training programmes.

9. UNIDO to cooperate with relevant national institutions to facilitate the adoption of international standards that would increase the participation of national IRS in national and international activities.

10. UNIDO to assist governments and professional associations in the preparation of codes of conduct.

11. UNIDO to assist governments to develop financial services to support national IRS.

12. UNIDO to assist governments to develop insurance services to support national IRS.

13. UNIDO to assist governments to develop export guarantee services to support the export of national IRS.

14. UNIDO to assist governments to develop guidelines for evaluating IRS firms.

15. UNIDO to assist governments to develop guidelines for remunerating IRS firms.

16. UNIDO to assist governments to develop guidelines for promoting sub-contracting and joint venturing among IRS firms.

**.c2. Technical Assistance at Firm Level;**

A number of the following measures may be best taken at a regional level in order to reduce the cost of providing the same service repeatedly in different countries; some of the proposed services are so specialised that the number of interested parties in each category may be too small to justify the sponsorship of separate national meetings.

1. UNIDO to support national consulting and contracting firms in one or more of the following methods:

- co-opting specialised manpower to enable them to meet pre-qualification standards;
- in establishing joint ventures with UNIDO;
- and/or in establishing joint ventures with other qualified (possibly commercial) enterprises.

The objective of this recommendation is to enable national enterprises to acquire the missing capabilities required to meet pre-qualification and pre-selection standards for national projects.

2. UNIDO to assist IRS to develop marketing skills to enable them to improve their competitive capabilities in the national, regional and international markets. The implementation of this action is through the provision of training and advisory services.

3. UNIDO to support national and regional information services to enable them to compile, classify and disseminate information on new projects.

4. UNIDO to organise regular workshops and conferences to assist local enterprises to interpret available data on industrial projects and to assist them in identifying the measures that they could take to modify and develop their competences in order to improve the marketing of their services.

5. UNIDO to support national and regional information services to enable them to prepare suitable directories containing information on locally produced services, materials and equipment.

6. UNIDO to cooperate with national and regional development banks with a view to establishing linkages between national and regional professional associations concerned with IRS in order to provide channels of communication between them. The objective here is to enable national IRS firms to acquire information on forthcoming projects at a sufficiently early date; early access to information should give IRS the opportunity of preparing themselves to meet pre-qualification requirements and/or to communicate with investors to prepare the ground for project participation.

7. UNIDO to develop linkages between investors and professional associations representing IRS with a view to bridging the communication gap between them. This may be achieved through confidence building measures and the diffusion of relevant information.

### **.c3.Consulting and Contracting;**

The activities falling under consulting and contracting have been identified as critical to development, employment and the growth of an IRS sector. The following actions by UNIDO have been justified in the Report:

1. Contribute to the development of national policies designed to promote national consulting and contracting capabilities;

2. UNIDO (singly or in collaboration with other interested organisations) to contribute to:

-- the establishment of data bases on national and international transactions in consulting and contracting;

-- the compilation and publication of tested models for contractual relationships in sub-contracting and joint ventures;

-- the compilation, publication and dissemination on a regular bases of case studies of disputes between clients, consulting and contracting firms which were referred to courts or to mediation;

-- the organisation of high power international courses suitable for professionals involved in negotiating and/or researching contracts with IRS firms;

-- advisory services to national firms to enable them to enter into realistic and efficient arrangements for the transfer of technology through joint ventures and sub-contracting;

3. It is recommended that UNIDO establishes facilities to enable it to provide "the small missing inputs" necessary to enable national consulting and contracting firms to undertake projects by utilising predominantly national manpower and resources. It can do so either by locating the relevant expertise or by assisting national firms to locate the requisite expertise.

It was shown that developing countries frequently fail to avail themselves of considerable resources that are at their disposal because they lack a relatively small input that can be supplied by UNIDO or some other source.

4. Project Management (PM) expertise is crucial to the process of technology transfer and capacity building: PM identifies the elements and components needed, is responsible for procuring them and for quality control.

5. Use of Local Services, Materials and Manufactured Products in Project Implementation: UNIDO to support the Project Management of substantial projects with a view to building national capabilities for a more effective utilisation of a country's resources during project execution. UNIDO's contribution may include the preparation of data bases on national resources and industrial output suitable to project management. UNIDO to introduce whenever necessary standards and quality control know how to enable local firms to meet the requirements of clients. UNIDO to provide when necessary assistance to consultants to redesign projects in order to make appropriate use of local resources.

**.c3. Developing Outsourcing Capabilities in Parastatals;**

UNIDO to assist governments to unravel monolithic parastatals through the development of outsourcing with a view to improve performance and economic efficiency. The restructuring and rehabilitation of firms and industrial complexes could be undertaken with outsourcing clearly in mind.

**.c. Regional and International Level;**

**.c2. Technical Assistance at Policy and Institutional Level;**

1. UNIDO to promote the networking of professionals, organisations and institutions on a regional and international level.

2. UNIDO to promote the development of international networks of research institutions similar to those of the Consultative Group on International Agricultural Research (CGIAR); the Tropical Diseases Research Programme, the Cotton Development International, The International Centre for High Energy Physics

at Trieste, and other such institutions. A network of such specialised research institutions could provide the needed training and research on a regular and systematic basis. It being noted that the contribution of IRS to economic activity in developing countries is already greater than that of the agricultural sector.

3. UNIDO to promote the cooperation among national and regional focal points; the objective should be to improve understanding of the importance of IRS in the national economy.

4. UNIDO to provide assistance through its ECDC/TCDC activities to coordinate regional networks and to highlight the importance of IRS.

5. UNIDO is a regular participant in regional meetings of ministers of industry. It is recommended that UNIDO uses these occasions to present studies and information that highlights the importance of IRS in industrial development.

**.c2. Technical Assistance at Firm Level;**

1. UNIDO to provide assistance to enterprises seeking to export their professional and business services. This can take the form of training, information and technical inputs.

2. UNIDO to provide assistance to enterprises to establish regional organisations for the promotion of their capabilities and the export of their services.

3. UNIDO to organise conferences at which enterprises could share their experiences and discuss solutions of common problems.

4. UNIDO to provide assistance to enterprises to affiliate with international organisations.

**.c. Cooperation with Other UN and International Institutions;**

UN organisations have focussed their attention sectorially and it is necessary to bring about a better understanding of how the different sectors interact. It is recommended that UNIDO cooperates with the International Institute of Advanced Systems Analysis (IIASA) an institution which has concentrated on this area of research. It should be useful to explore areas of cooperation with IIASA and other institutions specialised in this field. IIASA is based at Laxenburg near Vienna and this should facilitate cooperation.

UN organisations have still to develop suitable cooperative arrangements that would enable them to utilise the totality of the resources of the UN-system. Many policy issues are multi-disciplinary in nature and it should be possible to develop inter-organisational teams to address such issues. The fields of employment, labour, finance, trade, education and training and others could involve UNIDO with other members of the UN-System.

In the following we provide some illustrative examples.

ILO has sponsored a considerable number of programmes in the civil engineering and in repair and maintenance; it is actually involved in designing and constructing low cost rural roads, buildings. ILO also undertakes the training of technicians, the preparation of Distance Learning courses in construction management, and in various labour issues of industrial importance.

UNESCO has sponsors activities in engineering education, water resources, geophysics, science policy and areas of relevance to IRS.

These two UN organisations could make significant contributions in collaborative work.

#### **.c.Financing the Action Plan;**

The major component of the financing of the Action Plan may be secured in part through the services that UNIDO can provide development banks in fulfilling their mission in the industrial sector.

Additional financing may be securing from enterprises receiving UNIDO services. Some of the services addressed to enterprises requires the establishment of a UNIDO subsidiary-- see Implications of Action Plan for UNIDO.

#### **.c2.Development Banks;**

UNIDO's assistance to developing countries could be financed in part by the loans and grants provided by development banks. The number of international, regional and national development banks that support industrial development in developing countries is considerable. They are an important source of financing for industrial projects. The World Bank is the leading such institution. But then there are in addition to national industrial and development banks the Asian Development Bank, the African Development Bank, at least 10 Arab development banks with a regional and international focus (for example, the Arab Fund for Social and Economic Development, the Kuwait Fund for Economic Development and others).

The total official aid received by developing countries in 1990 was \$44 billion. UNIDO can make significant contributions to the implementation of many of the projects and programmes that this sum finances.

UNIDO's participation in the programmes of development banks could take many different forms, a few will be presented for illustrative purposes:

-- it can assist local consulting and contracting firms to pass the pre-qualification stage: this can be accomplished through the provision of a track record, specialised consultants,

joint ventures with international firms, and by other means;

-- it can assist the development banks in planning projects that have a high probability of success in the particular environment of the receiving country;

-- it can assist development banks in designing industrial projects to facilitate the use of local IRS;

-- it can assist both development banks and governments in planning the IRS environment to promote competitive outsourcing by the industry under consideration.

## .c2. World Bank;

The World Bank is the UN organisation with the largest impact on the development of consulting and contracting (CEDO) services. The World Bank has an important impact on the selection of CEDO's and government policies and procedures; World Bank procedures provide a model for many institutions in developing countries.

The policy of the World Bank concerning national IRS is fully in line with the recommendations made in this Report. The impact of World Bank procedures is crucial in ministries of transport, agriculture, water, planning and others. The developmental impact World Bank operations could be enhanced if UNIDO and other relevant UN agencies assist, during the project planning and execution, by providing the necessary inputs to increase the utilisation of national firms and manpower optimally.

At present there is a pressure on resources available for use in UN organisations. With the expected decline in UNDP direct financing it is necessary for UNIDO to develop alternative sources of finance. These may be readily found in association with the investment and post-investment phases of projects.

In the investment phase of a project funds are available for implementation purposes. These funds may be available from private, national or international sources.

The fact that UNIDO can make substantive contributions to the improvement of a project and/or to the reduction of the cost of its implementation, to the reduction in its foreign content and the requirement of foreign exchange should be welcomed by clients and they should be prepared to cover the cost of UNIDO services. These fees should be a fraction of the savings UNIDO induces.

UNIDO should also be able to reduce the cost of implementation by the use of local IRS who would -- in the subsequent phases -- contribute a critical role in reducing the cost of maintenance and provide services in product design and marketing.

During the operating phase of a project income is being generated by sales and the firm should be able to afford consultancy services. Thus the firm should be able to cover the cost of UNIDO

consultancies in process development, plant upgrades, product design from the improvements in its performance resulting from the input of UNIDO services.

UNIDO could also play an important function in participating with the World Bank in Human Resource Development programmes in developing industrial firms.

**.c. Implications of Action Plan for UNIDO;**

Most of the proposed recommendations may be undertaken by UNIDO under its present rules. However, substantial improvement in the speed with which UNIDO can respond to requests and implement them is necessary if UNIDO is to operate effectively on the enterprise level.

UNIDO has to work on the basis of commercial procedures: speed of delivery.

Increase in speed of delivery implies changes in rules concerning:

- working directly with firms/clients;
- changing the internal procedures within UNIDO concerning formulation and appraisal of projects and procedures concerning implementation (recruitment and procurement).

Enterprises find that these restrictive practices slow their communication with UNIDO.

In order to overcome these handicaps UNIDO may consider the course of action adopted by the World Bank when it created the International Finance Corporation (IFC) through which the World Bank is able to deal directly with enterprises. UNIDO could consider the establishment of a subsidiary which could serve enterprises speedily and competitively at partially subsidised commercial rates.