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Prepared by

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CONTENTS

	<u>Page</u>
INTRODUCTION	1
I. MOBILIZATION OF FINANCIAL RESOURCES FOR INDUSTRIAL DEVELOPMENT	3
II. STRENGTHENING OF SCIENTIFIC AND TECHNOLOGICAL CAPABILITIES FOR INDUSTRIAL DEVELOPMENT	14
III. ACCELERATED DEVELOPMENT OF HUMAN RESOURCES FOR INDUSTRIAL DEVELOPMENT IN THE ECWA REGION	31
IV. ENERGY AND INDUSTRIALIZATION	45
V. STRENGTHENING ECONOMIC CO-OPERATION AMONG DEVELOPING COUNTRIES	52
VI. LEAST DEVELOPED COUNTRIES IN THE ECWA REGION	64

INTRODUCTION

1. The Commission in its tenth session requested the Executive Secretary of the Economic Commission for Western Asia to include a special item in the agenda of the eleventh session on the Commission's Preparations for UNIDO IV (Resolution 120(X), 11 May 1983).

2. The joint ECWA/UNIDO Industry Division prepared this paper on "Selected issues included in the draft provisional agenda of UNIDO IV" in addition to the paper on "Industrial development and structure in the ECWA region: present and future scenarios" (E/ECWA/XI/9/Add.2). A paper on "Industrialization and industrial policies and strategies in the ECWA region" was also prepared for UNIDO's High-Level Experts Group on Industrial Development Strategies and Policies for Developing Countries held in Lima, Peru, 18-22 April 1983 in advance preparation for UNIDO IV. (UNIDO/IS.431/Add.1)

This paper presents the following six major issues:

- I. Mobilization of financial resources for industrial development (Agenda item 5(c)).
- II. Strengthening of scientific and technological capacities for industrial development (Agenda item 5 (b)).
- III. Accelerated development of human resources for industrial development (Agenda item 5(a)).
- IV. Energy and industrialization (Agenda 5(d)).
- V. Strengthening economic co-operation among developing countries (Agenda item 5(i)).
- VI. Least developed countries in the ECWA region (Agenda item 5(h)).

3. In preparing the above issues, the ECWA secretariat drew on the background and issue papers prepared by the UNIDO secretariat on the subject, including relevant literature relating to the High-Level Experts Meetings held by UNIDO on the major agenda items in advance preparation for UNIDO IV. However, emphasis was given in this paper on the ECWA region's outlook and its background, stressing issues and positions that are most relevant and important to the region.

4. The present paper and the above-mentioned two papers shall provide an added background for discussions related to the preparations for UNIDO IV at the Arab regional level (Sixth Arab Industrialization Conference scheduled to be held at Damascus, May 1984) and preparations for UNIDO IV within individual member countries.

1. MOBILIZATION OF FINANCIAL RESOURCES FOR INDUSTRIAL DEVELOPMENT

1. UNIDO IV is being held at a time when the world is experiencing an international economic crisis that has prevailed since the mid-1970s (see ID/CONF.5/13 and ID/CONF.5/19). Only in the last half year have signs of slow recovery been realized in leading developed economies. By 1982 growth in world production came to a standstill and for the first time since World War II, world trade fell significantly both in volume and value. The current economic crisis compares only to the world depression of the 1930s in terms of its depth of impact and duration. Although it has affected all countries, the developing countries have proved to be the most vulnerable. Developing countries have experienced budgetary cuts, shortages, and fluctuations in interest and exchange rates. Unemployment rates have risen more rapidly to much higher levels than in developed countries. In these countries there is no safety net such as the social security systems which one finds in developed countries.

2. For developing countries, the current crisis should be contrasted with the progress and structural transformation attained in the two decades ending around 1978. During that period economic growth and industrialization proceeded at a rapid pace and were financed mainly from domestic savings. The fruits of that progress, as well as the progress itself, are now threatened; efforts have to be directed towards preventing a move backwards.

3. The most severe impact of the crisis on the developing countries has been in the financial sphere. This has resulted from deterioration in the terms of trade and in a drastic reduction in the exports of the developing countries to the North as a result of the reduction in the demand and new protectionist measures by developed countries. This has reflected itself in the drastic adverse balance of payments and debt-service payments position of developing countries. Thus the total outstanding debt of developing countries, which stood at \$US 250 billion in 1978, had soared to \$US 800 billion by mid-1983. The repayment of medium-term bank debts by developing countries has increased from \$US 21 billion in 1977 to over \$US 44 billion by 1982. Short-term debts rose more dramatically in 1979 and 1980 and developing countries had to roll-over or repay over \$US 140 billion or three times the repayment of their medium-term debts in 1982 alone. If one adds interest payments of \$US 60 billion, the total payments by developing countries to service their debts was about \$US 244 billion in 1982. In percentage of exports the ordinary debt-service ratio (medium- and long term debts) rose from 6 per cent in 1977 to about 24 per cent in 1982, while the total debt-service ratio (including ser-

ving and roll-over of short-terms debts) rose from 32 per cent to about 60 per cent respectively. Debt service as a proportion of ongoing borrowing for all the least developed countries now stands at about 150 per cent.

4. With respect to member countries of the region the impact of the oil boom that began in 1973 was reflected in the economic progress achieved in the 1970s and the early years of the 1980s. However, indicators of a slow-down have been recorded in the last two years. Thus in overall quantitative terms, during the 1970s the countries of ECWA region attained an annual growth rate of about 10 per cent at constant prices in both gross domestic product (GDP) and manufactured value added (MVA). Based on ECWA estimates real annual growth rate for MVA was maintained for the years 1980-1983, while the GDP annual growth rate recorded a negative growth of 6.4 per cent mainly owing to the fall in oil exports and prices.

5. It is within the above-mentioned current international and original setting and constraints that the issues on mobilization of financial resources have been conceived. The major issues prepared by the UNIDO secretariat for consideration at UNIDO IV include:

(a) Interlocking of external and internal finance;

(b) Crucial areas in which external finance complement resources in industrial development;

(c) Adequacy of industrial finance for development;

(d) Barriers to private sources of external credit and attributes of industrial finance;

(e) South-south co-operation in industrial financing.

6. In this note, relevant issues to ECWA member countries are discussed with respect to action and measures called for at the regional level (ECWA and Arab League), regional-South level and regional-North level.

A. Mobilization of financial resources in the region

7. It is significant to note that since the 1970s the manufacturing sector has been given increasing priority in the development plans of member countries. The investment in industry including manufacturing has been consistently increasing in both absolute terms and in percentage of total investment in most member countries. Thus the planned investment during the period 1975 to 1980 for all the Arab countries in the manufacturing and

mining sector has increased to about \$US 64 billion (23 per cent of total investment), as compared with an actual investment of \$US 11.2 billion (20.7 per cent of total investment) for the period 1970 to 1975. For ECWA member countries these figures are respectively \$US 35 billion and 3.5 billion. Projected investment for the period 1980 to 1985 for the manufacturing sector in all Arab countries is estimated at \$US 118 billion or an equivalent of ten times (10) the actual investment for the period 1970 to 1975 and about twice that planned for the period 1975 to 1980(1). Aside from the increasing emphasis given by member countries to industrial development, the rapid rise in investment also reflects the change in the pattern of investment in member countries. Whereas most of the investment in the early 1970s and before was concentrated on light and consumer durable industries, the investment in the late 1970s and planned investment into the future shifted in favour of investment in intermediate and capital goods and engineering industries with a consequent increase in investment requirements on account of the high capital intensity of these industries. By and large the oil-producing countries have been allocating a large proportion of their investment for intermediate industries that depend for their development on petroleum as a raw material or for those industries utilizing cheap energy.

8. Another feature to be noted is the shift in the distribution of investment among oil and non-oil countries. Thus in the period 1970-1975 the latter's share was about 45 per cent of total investment, decreasing to about 28 per cent in the period 1976 to 1980 and likely to continue to decline in the future, although not at the same rate.

9. The so-called "two-gap" constraint in resource mobilization, including the foreign exchange constraint faced by most developing countries in their industrialization drive, has not been as severe for most ECWA member countries. The oil revenues have been the source of funds for investment in oil-producing countries and only a few countries in this category have resorted to foreign borrowing. Non-oil producing countries have been obtaining foreign exchange and securing external financing through a combination of the flow of bilateral aid mainly from oil-producing countries and Arab development and financial institutions, and from the transfer of earnings of nationals working in oil-producing countries.

10. The Arab countries received the highest share, about 60 per cent of the total official flows (multilateral and bilateral) from Arab - OPEC countries to all developing countries. Total Arab-OPEC official flows have been estimated at \$US 55 billion for the period 1973-1981. It is to be noted that the role of the Arab development institutions has been increasing over the years. Their share in total disbursement of funds has increased from less than 10 per cent in 1970 to about one-third of total

flows in recent years. Thus in the period 1970-1975, the Arab development institutions increased their contribution to Arab countries from 205 million dollars during the decade of 1960s to 6.2 billion dollars during the decade of the 1970s.

11. The contribution of the Arab development institutions continued to increase significantly through 1982. Figures relating to the two years 1981-1982 were reported at about \$US 2 billion which is one-third of the total loans extended in the last decade. It is interesting to note the growing share of the developing countries compared to that of Arab countries: whereas developing countries received in 1974 only 8.6 per cent of the total loans by Arab development institutions their share increased to 43 per cent in 1977 and climbed further to about 60 per cent in 1982(2).

12. With specific reference to the industrial sector, the Arab financial institutions have extended credit and loans, mainly to non-oil Arab countries, of about \$US one billion during the decade of the 1970s; this compares to total estimated planned investment in industry of about \$US 24 billion equivalent to 4.2 per cent of total investment.

13. A number of important issues may be posed for consideration by the Conference. The first issue relates to instruments and measures needed to increase the flow of funds to industry from bilateral, Arab development and financial institutions and private sources in view of the relatively low share of industry recorded in the past in external financing. A related issue concerns securing adequate financing for certain dynamic industries that have so far not been receiving sufficient funds. This includes the field of engineering industries, the development of which is required to attain a balanced and dynamic industrial growth. The second important issue is to promote and encourage the flow of private Arab funds into industry. This is especially important in view of the fact that the share of private savings generated in the surplus countries has been high and that the private sector has been showing increasing interest in investment and industry. While it is difficult to ascertain the magnitude of financial flows among ECWA countries, especially by the private sector, it is known that a significant amount of private funds has been invested in real estate as well as in commercial and industrial ventures in the region. However, it is safe to assume that investment remains of marginal importance when compared to private investment abroad.

14. The following instruments and measures are posed for consideration:

(a) Increasing efforts are needed for identification of "good" and "bankable" projects and increased resources should be secured for this purpose. The joint UNDP/Arab Fund for Economic

and Social Development programme for identification and preparation of Inter-Arab investment projects and related feasibility studies has concentrated mainly on development of the region's infrastructure and exploration and development of natural resources. Existing programmes should increase efforts in the field of identification of industrial projects, both at the national and regional levels and a new programme concerned with industry may be created and supported by regional development and financial institutions, joint Arab industrial companies, UNDP, UNIDO and ECWA;

(b) Greater emphasis should be made by Arab financial institutions on promoting industrial projects including equity participation;

(c) Private financing of industrial projects should be promoted either separately or jointly with Arab financial institutions;

(d) Joint Arab industrial projects should be promoted at Arab regional and subregional levels.

15. Another important issue that needs to be considered relates to providing "programme" financing facilities. The need for such facilities derives from the fact that certain industries in a number of member countries owing to a variety of reasons that includes low-level of training, both technical and managerial, obsolete equipment, backward technology, and under-utilized capacities have been suffering from low productivity and a low level of performance. This calls for an in-depth industry-wide examination of the ailing industries and the formulation of a programme including financial requirements for improving the performance and productivity of such industries. National and Arab financial institutions need to provide credit facilities to finance programmes for raising productivity in order to better utilize industrial capacities.

B. ECWA - south and-north co-operation

16. In this section, the following background may be taken into consideration:

(a) The total flow of financial resources in the international capital market increased from \$US 159 billion in 1977 to about \$US 340 billion in 1981. The non-oil exporting developing countries share was only 40 per cent while the remaining funds went to industrialized countries;

(b) If one considers only non-official flows, which account for 85 per cent of total capital flows, the contrast is more impressive. The share of non-oil exporting developing countries accounts for between 23 and 24 per cent. At the same time, official development assistance (ODA) increased only slightly, from \$US 22 billion in 1977 to US 37 billion in 1981;

(c) There has been an increased privatization of the international capital market with the consequent high costs and less favourable terms of borrowing for developing countries. The proportion of private credit increased from about one-third in 1967 to almost two-thirds in 1981.

(d) While there are sufficient funds in the international capital market, in fact, there is a less than adequate flow of finance for industry in developing countries owing largely to shortcomings in the international financial system. Two aspects need to be emphasized. The first relates to the fact that existing multilateral financial institutions channel rather small amounts of funds from the international market directly to industry in the developing countries. The second aspect relates to the fact that the bulk of the funds for industrial financing in the developing countries has so far been channelled through export credit institutions and commercial banks, under terms and conditions that are not always the most advantageous. Loans extended to developing countries by commercial banks have been concentrated on a few selected countries, principally in the intermediates to higher-income group. Most of the developing countries have either been unable to meet their financial needs by borrowing from commercial banks or have had to accept terms that exacerbate their financial difficulties;

(e) Should these trends continue, UNIDO has estimated that over the period 1981-2000 only about 50 per cent of the required external flows to manufacturing required to meet the Lima target will be met with a shortfall of about \$US 650 billion. Should this trend continue, there will be a progressive deterioration in the situation and annual foreign flows for manufacturing investment in developing countries will be about \$US 50 billion at the end of the century, meeting only one-third of the Lima requirement.

17. Turning now to the international flow of funds from Arab-OPEC member countries, the following background may be considered:

(a) Total official flows from Arab-OPEC countries to all developing countries have increased continuously from \$US 1.1 billion in 1973 to a peak of \$US 11 billion in 1980 and falling to \$US 9.4 billion in 1981;

(b) The concessional assistance portion of this flow has increased from a low \$US .4 billion in 1970, rising significantly in 1975 to \$US 3.0 billion, reaching a peak of \$US 8.2 billion in 1981. It is to be noted that most official financial flows to other developing countries take a bilateral form, although this form has been declining; from 92 per cent of the total in 1973, decreasing to 81 per cent in 1978 and 75 per cent in 1981;

(c) By 1973 Arab OPEC countries had already replaced Council for Mutual Economic Assistance (CMEA) donors as the second largest donor group after the Development Assistance Committee (DAC) group, rising from 5 per cent in 1970 to 30 per cent in 1975, and, however, falling in the following years to 22 per cent of total aid in 1981;

(d) The Arab OPEC member countries have continued to contribute substantial volumes of concessional assistance and to devote a high proportion of their GNP for this purpose, in spite of the fall in their oil revenues. It is to be noted, however, that the share of GNP devoted to concessional assistance has been generally falling over the past few years and it seems unlikely that the high ratios achieved earlier will again be achieved (7 to 8 per cent). In 1981 the average for ECWA member countries was about 3.5 per cent.

(e) With respect to sectoral distribution of aid, general purpose assistance has dominated the bilateral concessional commitment by member countries. The share of such assistance, which had fallen from over 80 per cent in the early years of the decade to 56 per cent in the middle of the decade, has risen again in recent years and in 1981 absorbs four fifths of the bilateral commitments. This situation is primarily due to sizeable amounts of general support assistance (budget and balance of payment support). With respect to project assistance, the share of infrastructure projects that includes transport, storage and communications has been the leading sector followed by energy. Industries, including manufacturing and mining, have had a small share of the total assistance, ranging between 1 to 3 per cent on the average;

(f) With respect to deployment of Arab OPEC surpluses, the major part of this surplus, over three-quarters, continues to be placed in developed market economy countries, notably the United States of America (25 per cent) and the United Kingdom of Great Britain and Northern Ireland (20 per cent). International organizations and institutions share about 6 per cent, and the share of developing countries, including grants and loans averages less than one-fifth of the total. The breakdown by type of instruments gives the bank deposits (\$US dollars and British pounds sterling) the main share in the surplus accounting to about 38 per cent of the total. Treasury bonds and treasury bills (mainly in the United States and the United Kingdom) absorb another 8 per cent of this surplus.

18. Taking into consideration the above, the fundamental challenge for international policy on industrial finance falls under the following two headings:

(a) Identification of means to increase the volume and improve the terms of the flow of funds from North-South, East-South and South-South required to meet overall industrial development goals;

(b) Identification of finance mechanisms to support changes in North-South and South-South patterns of investment, technology and trade.

19. This fundamental challenge has to be seen in the perspective of the massive flows in industrial investment, of the order of \$US 500 billion per annum required by the year 2000 if the LIMA Target is to be attained; of this sum about one-third might have to be covered by external financial flows.

20. These considerations led to the development of two major approaches which were placed before the international community meeting at the Third General Conference of UNIDO at New Delhi in 1980. The first called for the setting-up of an international industrial finance agency to promote South-South co-operation in financing industrialization by converting financial surpluses available primarily in oil-producing countries into durable forms of long-term investment in the Third World. The second concept called for the setting-up of a global fund for stimulation of industry in recognition of the crisis in the international economy: global recession coupled with global inflation and instability of the international monetary and financial systems; in essence, the global fund proposal envisaged the provision of a quick-dispersing programme financing loans to developing countries on extended maturities and in significant amounts reaching an annual level of over \$US 15 billion. Subsequent to UNIDO III, discussions and negotiations continued and the UNIDO secretariat submitted to the Industrial Development Board at its fifteenth session a proposal to estab-

lish an international bank for industrial development. While the Board has continued to request reports on relevant developments, further action on this proposal has been deferred.

21. There are a number of other important issues that member countries may wish to deliberate on. These include:

(a) Within the existing mechanisms for the flow of Arab-OPEC funds, the identification of means to improve the terms and increase the volume and value of financial flows to developing countries;

(b) ECWA-South co-operation in industrial financing;

(c) Optimum utilization of surplus funds through redeployment of present funds to increase economic and developmental benefits.

22. Aside from bilateral aid extended by OPEC/Arab countries to developing countries, Arab multilateral finance institutions that include OPEC/Arab development funds and banks, international Arab commercial banks and Islamic financial institutions, can be called upon to play a greater role in providing industrial financing to developing countries. These institutions have, by and large, not committed a substantial portion of their financial resources to industry.

23. The development of "good" and "bankable" projects can help in increasing the flow of funds to industry in developing countries. Consideration may be given to the creation of a "programme for identification and preparation of industrial projects in developing countries" broadly tailored after the joint UNDP/Arab Fund for Economic and Social Development Programme. Associated with this is the formation of an industrial financial information, promotion and negotiation network. The Arab League Chamber of Industry could play an important role in such a network especially in the promotion of private investment.

24. Instruments for promotion of joint South-industrial projects, including development of resource-based industries, need to be considered. There are a number of industries where mutuality of interest can forge joint action leading to increased economic ties and trade between member countries and the South. Specifically, such areas of mutual interest include mineral and petroleum-based industries. Member States have relatively limited mineral resources such as bauxite, iron ore and copper. Oil-producing countries have a comparative advantage in petroleum-based industries, particularly petrochemicals and fertilizers.

25. Turning to the deployment of the Arab-OPEC surplus, four ideas are posed for deliberation:

(a) The increased privatization of the international capital market has imposed severe economic and financial constraints on the developing countries, and member countries concerned may wish to look into redeployment of surplus funds in favour of international development and financial institutions which currently share about 6 per cent of total surplus funds;

(b) Redeployment could be achieved through acquisition of interest in favour of industrial companies, particularly those with advanced technological capabilities.

(c) Redeployment should aim at acquisition of engineering and technological capabilities. This includes selected consulting, industrial engineering and construction firms and institutions.

(d) Deployment of resources should aim at building-up technological capabilities in advanced technologies: micro-electronics, bio-engineering technology, deep ocean mining technologies and certain space-related technologies (i.e. remote-sensing techniques, photo-voltaics). It is a fact that in these new areas a large number of new companies and institutions, usually small-and medium-sized, have been evolving. With adequate planning and moderate resources (risk capital) acquisition of interest in selected concerns can secure to member States a place in future technologies.

Notes

1. League of Arab States, Cairo (in Arabic). The Unified Arab Economic Reports. Issues of 1981 and 1983.
2. ECWA "Resource Transfers and Financial Co-operation in Western Asia" August 1981. (unpublished).

II. STRENGTHENING OF SCIENTIFIC AND TECHNOLOGICAL CAPABILITIES FOR INDUSTRIAL DEVELOPMENT

1. In general, the technology transfer process within the ECWA region can be associated with import substitution policy since its elements have been effected mainly through contractual arrangements adopted for establishing relevant industries. The weak industrial base and inexperienced negotiating position associated with the early stage of development in the ECWA member States slowed down the technological transfer process when pursued via this regular trade channel.

2. For some countries, the problem was more severe because of the limited manpower resources and industrial institutional infrastructure to accommodate their ambitious industrial plans. In a few cases the short supply of experienced nationals qualified for further specialization became more critical owing to brain-drain problems, social instability and job discontinuity. Thus, reliance on foreign institutions and on foreign manpower and expatriates for simple as well as high technological activities continued to be an imperative factor in planning and manning industrial and engineering operations.

3. In the case of those countries that had achieved an advanced level as far as their basic science education and industrial programme were concerned, the development of engineering design and research managerial skill within a coherent technological system was not given its due accord in view of the limited absorptive capacity on a country level. Accordingly, technological dependence in specific branches of industry has continued with the minimum self-reliance associated with industrial development. This situation has resulted in a slow and less effective programme for generating indigenous technologies.

4. Technocrats and officials in many ECWA member States are becoming aware of the problem and of the need for measures on a national level to formulate practical programmes for building technological capacity within the context of an overall master plan in conjunction with the development plan of a particular country. Some officials have gone further by promoting the same ideas on a regional level with the emphasis on specific economic sectors. An important aspect of relevant policy measures studied or adopted in support of such a programme has been the promotion of an institutional mechanism that incorporates a continuing trans-disciplinary process which cuts across the technology delivery system with its absorption-diffusion-application traffic and tools. This mechanism should provide channels of communication among the production sector, the market and the technology management.

A. The status of technology in the ECWA region

I. General background

5. Nine of the ECWA member States are oil producers, but only five of those are major oil exporters (e.g. Iraq, Kuwait, Qatar, United Arab Emirates and Saudi Arabia). The economic and trade structure in major oil-exporting countries is almost entirely dependent on a single commodity, oil, except in Iraq, which has a broad-based economic structure consisting of fair-sized agricultural, industrial and mining sectors. The other four (e.g. Egypt, Syrian Arab Republic, Bahrain and Oman) enjoy a diverse economic base with agriculture and/or trade as major elements, along with industry in the case of the first three. The rest are non-oil producers (e.g. Lebanon, Jordan, Yemen and Democratic Yemen). Two of them (namely Yemen and Democratic Yemen) could be classified roughly as least developed countries with a low per capita income; a limited natural resource base; a limited range of manufacturing activities and service industries; and a dependence mainly on the subsistence agricultural sector (including fisheries). The other two (Lebanon and Jordan) are characterized by a diversified economic base with industry and/or mining playing as important a role as agriculture and trade.

6. The development strategy pursued by all the countries in the region, while differing sharply in specifics, could have three broad objectives:

(a) To diversify their economies through expansion of the industrial sector (particularly petrochemicals in the case of the oil-producing countries);

(b) To form a rational development programme for the exploitation of their natural resource base (e.g. minerals, other energy sources, fisheries, etc.);

(c) To raise productivity levels through the application of capital, skills and techniques (broadly defined as production methods).

The attainment of all three objectives would mean that much greater attention would have to be placed within the region to the problems of transfer and development of technology than has been the case hitherto.

7. The approaches of these countries with regard to these objectives, however, has differed from case to case according to the socio-economic structure prevailing. The State (public/socialist) sector is playing a predominant role in four countries (Egypt, Iraq, Syrian Arab Republic, Democratic Yemen)

while a mixed economy approach (involving differing degrees of State and private sector participation) is being adopted in all others, except for Lebanon (and, to a certain extent, Jordan) where the private sector plays the dominant role.

8. Most countries in the region, particularly major oil exporters, have embarked on highly ambitious development programmes. The major constraint in the implementation of these programmes is the shortage of skilled manpower. Attempts have been made to deal with this problem through the introduction of appropriate education and training programmes. In the meantime, heavy dependence on foreign skills continues.

9. As regards the organizational structure and level of consciousness pertaining to technological issues, ECWA countries may be divided into three broad categories:

(a) High level of consciousness in respect of technological issues and fairly well-developed institutional infrastructure, though lacking in co-ordination;

(b) Adequate and increasing level of consciousness with limited institutional infrastructure, though plans for establishing institutions and policies have yet to be formulated;

(c) Minimal level of consciousness, absence of institutions and no identifiable plans for institution-building to tackle technological issues.

Five of the countries (Egypt, Jordan, Iraq, Lebanon and the Syrian Arab Republic) could be classified under the first category and perhaps two may be classified as falling under the last category, while the rest fall in the second category.

2. Policies and instruments for the transfer of technology

10. Available information illustrates striking differences in the overall planning approaches of the ECWA countries which are directed toward various areas of economic and infrastructure development but not toward development of technological capabilities.

11. Except for three countries, formal economic planning has not been adopted until recently. In most cases, the implementation of these plans has fallen short of the desired goals and very few countries have taken the effort to assess the shortfalls of their plans performance. Therefore, it is not unnatural to see that technological planning has not taken place, and that the links between technological objectives and socio-economical objectives have not yet been established. In other words, technological programmes have not yet been institutional-

ized properly or formulated within the context of the socio-economic development plan by any of the countries concerned.

12. The transformation of the socio-economic structure in most, if not all of these countries has brought about a significant change in the volume of imported goods and technological services. For some countries such as Egypt, Iraq and the Syrian Arab Republic, where the process has been going on for a long time, the Government has gradually recognized the implications of their full dependence on the outside market for the supply of goods and services. The logical response has been to adopt certain policies through which those goods and services could be used to upgrade local technical capabilities.

13. In support of such policies, those countries started years ago to establish training centres, educational institutions, engineering and research organizations, etc. But except for the formal educational programmes, none of the other activities have been successfully integrated with the production sectors or have lived up to their aspirations. As a result, most of the countries have felt the need to have a higher authority to deal with the technological aspects of development.

14. The diversity of opinions in these countries with respect to technology is a direct result of the level of development of each country, the characterization of its manpower and essential concepts for its economy. Accordingly, in some countries more importance is placed on the establishment of technological instruments (institutions) on a national level, i.e. training centres, applied research organizations, engineering design institutes, etc. Long-term objectives which are designed to create, as far as practicable, a self-sustaining technology are being considered in only a few cases (Egypt, Iraq, Jordan and Syrian Arab Republic). This definitely entails the assessment of the level of technological development before formulating the appropriate component within the context of the development programme. Such a methodology has not yet been synthesized by any of the States mentioned above.

15. To deal with the problem, some countries are in the process of organizing a central organ which might assume the role of a policy-making body to plan, legislate and/or follow-up on various activities and directives pertaining to technological programmes. Progress, however, is more noticeable in the establishment of institutions to deal with certain project functions (mainly research) and issuance of instructions to project executors to promote on-the-job training for local manpower by foreign consulting and contracting firms.

16. In general, most countries approach the issue of technology transfer with fragmented policies and unco-ordinated activities

that have a minimum correlation to the technical resources and functions of related departments, rather than by adopting a well-defined overall policy or guidelines for regulating and adapting technology. The only broad policy instrument which has some limited bearing on technology is the one dealing with investment procedures and contracting activities. In addition to the incentive policies, some guidelines for pre-investment considerations and investment opportunities touch mildly on the technological concepts, requirements and constraints.

17. In terms of industrial technological capacity, the following summarizes the status of the essential technological infrastructure in the region.

(a) Research

18. The oldest form of research in most of these countries has been that which is undertaken by the agricultural experimental and extension stations. Almost in all of these countries the work of these stations started on a very limited scale in regard to certain crops. Industrial research, on the other hand, has not yet been developed as an important tool for commercial purposes. Only recently have R & D programmes been launched or pursued formally in some countries. Egypt, Iraq, Jordan, Kuwait and the Syrian Arab Republic have independently established some facilities for applied research, destined to support the development of certain subsectors.

19. Other forms of research have been pursued at different academic institutions in some countries. But most of the research work has been of a basic or theoretical nature, rather than of an applied or a commercial nature. In Egypt, Iraq and Lebanon, where research activities started at a much earlier stage than in other countries, attempts have been made to link research to users, but with limited success. This has been attributed to the private sector's unconsciousness of the relationship between research and the commercial aspects of its industrial ventures, and to the institutional set-up of the public sector where co-ordination is missing.

20. In the case of most of the Gulf States, the emphasis on R & D has not been very serious owing to the shortage of local skilled manpower, the limited size of the domestic market and the infancy of the industry. Furthermore, the absence of financial constraints and the low level of local participation in technical management have encouraged the reliance on imported technological services which have all along been organized for in-plant trouble-shooting rather than for promoting the development of products and production facilities.

21. Thus the only form of research that is directly linked to industrial production is that pursued at the factory level

directly associated with trouble-shooting. Almost all medium and large industrial plants have their own quality-control facilities which are sometimes involved in research activity which is directly linked to the production programme. Some of these facilities are thought of as a nucleus for R & D centres in a limited number of important industries.

(b) Training and manpower skill

22. In general, the training programmes in all countries have been of a traditional academic nature. Aside from the establishment of a few technical and vocational training centres in some countries, little emphasis has been placed on the applied side of science courses for the development of technical skills and technological capabilities. Attempts have been made in some countries to institutionalize the educational system within the overall development process, but the progress has been very slow.

23. Reliance on foreign skilled manpower has been very appreciable in many countries, and particularly in the oil-rich Gulf States, during the past two decades. In a few countries, an intensive institutionalized training programme has been launched, but the results have not been tangible. In some cases, particularly in the Gulf States, the problem is magnified by two factors; the small population of nationals and the unlimited opportunities to pursue private business, which drains local skills. Thus the dependence on expatriates as common labour for construction, operation and social services continues. This has led to the selection of capital-intensive rather than labour-intensive projects for development; a process that has resulted in the purchase of sophisticated technology requiring higher skills.

24. Skill and manpower planning is pursued in different countries at a varied degree of enthusiasm and effectiveness. Only in a few countries a serious approach is made for the integration of manpower and skill development in the socio-economical planning machinery. In others, some attempts are being made to provide for the development of local skills through uncorrelated training and educational programmes and facilities.

25. It is to be noted that some regional or subregional training programmes have been under way. Certain specialized training centres and continuous education programmes have been implemented for upgrading the skills and qualifications of nationals from different countries within the region, through the initiative, or under the auspices of regional organizations such as the Economic Commission for Western Asia (ECWA), the Arab Industrial Development Organization (AIDO), the Gulf Organization for Industrial Consulting (GOIC) and the Organization of

Arab Petroleum Exporting Countries (OAPEC). On the other hand, a few national universities and technicians training institutions in the more developed countries of the region (Egypt, Iraq, Jordan, Lebanon and the Syrian Arab Republic) have been very effective in providing educational opportunities to nationals of other countries. Recently, universities in Kuwait and Saudi Arabia have been following suit.

26. In seven countries (Egypt, Jordan, Iraq, Kuwait, Lebanon, Saudi Arabia and the Syrian Arab Republic), the sciences and engineering are receiving prior attention where some links with certain productive sectors can be, or are being established. In the case of Egypt, Iraq and the Syrian Arab Republic, where agriculture and engineering education have been developing for a longer period of time, systematic planning is being pursued as an integral part of the overall development programme with specific macro and sectoral targets. Other countries devote a notable portion of their development budget for their educational and training institutional set-up, but with no detailed analysis of the planning procedure in identifying the technological aspects and implications. In the well-established universities, graduate programmes are being pursued for engineering and natural sciences as well.

27. Some countries have established educational councils within the context of, or under the supervision of the Ministry of Education as a policy-making body among whose responsibility is the supervision and co-ordination of training and/or placement. In a few cases more than one educational council has been established to function on a sectoral basis, i.e. agriculture education, industrial education, etc. Certain countries have organized their educational planning authority as a high-level (probably ministerial) multidisciplinary council or as a manpower planning department attached to the planning machinery.

28. Lebanon, among the first countries to have a high level of educational system, has been a major source of developed skill for the region. But it was not until recently that its high-level education programme became a major component in the planning machinery.

(c) Engineering and design

29. In all countries, the major channel for the acquisition of technology has been associated with the procurements of capital goods from abroad and with construction and engineering services in conjunction with specific productive sectors. For the most development projects, foreign expertise is needed for one or more of the project implementation functions.

30. Attempts have been made to establish central agencies for projects development in most countries. Initially, these agen-

cies were organized with the help of foreign advisors to build up the domestic capabilities for identifying the evaluating development projects. A major constraint in developing these units has been the shortage of local skilled manpower, the non-existence or ineffectiveness of intersectoral and inter-institutional linkages, and inefficient infrastructural and management techniques.

31. Egypt and Iraq, which started a systematic approach for project development almost three decades ago, have attained a certain degree of self-reliance in dealing with the planning and certain phases of implementation of industrial projects. Other countries have established an industrial consultancy and promotional unit (department) with the assistance of specialized regional and international agencies such as AIDO (formerly the Industrial Development Centre for Arab States), UNIDO, The World Bank, international consultants, etc. for the purpose of identifying projects, evaluating tenders and contracts, and assisting in the formulation of an industrial programme.

32. Seven ECWA member States still rely heavily on skilled expatriates for staffing these technical departments. For development of these departments the major constraint is the non-availability of counterparts to the foreign staff or advisers, to be trained and continue operating the departments after the latter depart.

33. In most countries, negotiation with foreign and multinational companies in respect of establishing an industrial plant conducted by government departments is done with the assistance of foreign consultants or expatriate advisers. In certain cases, a high central authority pursues the negotiation for strategic projects or for projects involving foreign economical assistance.

34. Although some countries have been experiencing engineering activities for many years, design capacities have not yet attained a high level of proficiency nor are they abundant enough to comply with all needs. Except for civil and architectural engineering, which has developed in a few countries (Egypt, Lebanon, etc.) very little has been achieved in the design function, i.e. process design, systematic engineering, product design, etc. The constraints facing the development of design capabilities have been attributed to the lack of enough training and efficient programming and systems management in countries where the engineering population is adequate, and to the involvement of the limited number of engineers in other engineering activities, i.e. plant operation, management of projects, contracting business, etc.

35. In a few cases, repeated projects handled by the same organization have allowed the development of technical and spe-

cialized skills which enable the national staff to analyse and select designs, specifications and patents of certain technologies. But in most cases, the assistance of consultants was sought. Recently, some steps were taken by some countries (notably Iraq) to have a practical training procedure through the establishment of a joint activity for the engineering services of definite projects where the expertise of well-known specialized foreign engineering firms could be institutionalized locally with nationals sharing full responsibilities with their counterparts throughout all implementation stages.

(d) Industrial data bank

36. None of the ECWA member States has a central institution (public or private) which collects, filters and disseminates information to potential users. However, in a very few countries, some institutions have established a data gathering system that suits their functions. However the fragmented sectoral efforts in this direction have not been co-ordinated within each country and the deployment of their results is still limited. In some cases, information relating to science is in the process of being established and most likely the existing information is stored in academic institutions and certain specialized organs (i.e. Kuwait Institute for Scientific Research (KISR) etc.). Ineffective utilization of this information might be attributed to the shortage of adequately trained manpower. This problem is exaggerated in the absence of a centralized controllable system since some departments in these countries occasionally duplicate each other's work and at times even repeat their own efforts in obtaining and reanalysing specific information.

37. On a regional level, efforts are being pursued by certain specialized institutions and corporations (i.e. AIDO, GOIC, OAPEC, etc.) to build up a documentation set-up to serve their own needs, with the notion that such a set-up would incorporate research tools on a national and regional level. Some plans are being considered to have national documentation centres with terminals which link with all sources of information pertaining to technologies, projects contracts, etc. within and outside the region.

(e) Standards and quality control

38. Most countries in the region are involved in organizing measurement and specification standards on a national basis. Such efforts are being pursued at different levels but in most cases with limited success. The shortfalls of the various programmes are attributed mainly to the public's non-awareness of the importance of standards, the shortage of skilled manpower, and ineffective quality control system within the concerned country.

39. Reliance on foreign standards brought about a heterogeneous collection of codes within each country. A collective attempt is being pursued for a coding procedure by the Arab Organization for Standards and Measurements, with the aim of unifying the standardization function within the Arab countries. Some codes have been adopted on a national and regional level, but enforcement policies are still missing.

40. Quality control of locally-produced goods is being pursued by specialized units of some operating companies, particularly those which export their products. Only four ECWA member States have a centralized system for quality control of locally produced and of imported goods such as foodstuffs and pharmaceutical products, etc. as an official testing/control and surveillance agency to verify the standards and specifications of these products. International inspection agencies and laboratories are still the main organs undertaking this task for the bulk of the goods imported by the region.

(f) Industrial property

41. Most of the countries have legislation concerning the protection of trade marks and some even have legislation on the protection of inventions.

42. The national institutions entrusted with the administration of industrial property have traditional functions, namely: acceptance of applications for protection, and formal examination as to the legal requirements, grants and administration of granted titles of protection. However, none of these institutions seems to have established proceedings to examine novelty, inventive activity and industrial application ("examination as to substance").

43. Most of the national institutions entrusted with the implementation of industrial projects have access to licence agreements in respect of specific projects being implemented. However, it is in four countries only that industrial project implementation organs evaluate technological alternatives and relevant licence agreements. These organs are in a position to give information on available technology or to assist possible national investors in negotiating contracts.

44. As regards promotion of inventive activity, some countries have taken measures and/or adopted a system for the promotion of innovation, both in the public and private sector. Some incentives are provided by these countries to encourage innovation, but it appears that the system adopted could be improved.

45. A few countries have or are in the process of establishing institutions or procedures for patent documentation. In most cases, it appears that the collections of patents - describing

technological advances in the existing state of the art are very rarely consulted by national investors (public and private). The majority of these collections are classified according to various local systems and not on the basis of international classifications.

46. However, it is to be noted that several countries are either engaged in or planning to start various procedures for modernizing their industrial property institutions and legislations.

(g) Manufacturing and procurement of capital goods

47. Heavy engineering industry in the ECWA region is still at its infant stage. It comprises mainly assembly lines that include agricultural machinery, mostly tractors in Egypt, Iraq and the Syrian Arab Republic and truck-car assembly lines in Egypt, Iraq, and Saudi Arabia. In all cases, licensing arrangements have been signed with different manufacturers from developed countries for the planning and implementation of these projects. The implementation side of the projects development usually involves the supply of plant machinery and tools including a utilities facility, the provision of most components for each product according to the licensors own patent and design, and an operation and technical management contract which provides for training of local staff for a certain period.

48. Some of the contractual terms included in these agreements made provision for technical assistance for product development, in which case some of the licensors modifications would be introduced. Reference has been made also in some of these agreements to the development and utilization of local material and a fabrication facility whenever suitable and possible as the project develops. But it seems that little was achieved in that direction during the first few years of the life of these projects. Furthermore, reliance on expatriates for trouble-shooting purposes was maintained for some time in many projects. However, it has to be noted that indigenous relevant capabilities are being built and the experience gained will have a positive impact on development.

49. Other capital goods industries in the region include assembly lines for household electronics and durable consumer goods. Engineering products manufactured in the ECWA region also include small-size industrial transformers and boilers, cables, pipes, construction steel structure and implements, and simple chemical-processing equipment, i.e. atmospheric pressure columns, heat exchangers, storage tanks, etc. Countries involved in one or more of these production activities include Egypt, Iraq, Kuwait, Lebanon, Saudi Arabia and the Syrian Arab Republic. In most of these industries, which are usually private enterprises or joint private-public projects, licensing agree-

ments with foreign suppliers are usually associated with certain trade names.

50. Other supporting activities for the capital goods industry in the ECWA region are not institutionalized properly on a large-scale and systematic basis. Maintenance activities are still either fragmented activities in small workshops or attached to operating plants. The only organized maintenance activities on a large-scale can be found at some port dockyards and central railway stations.

51. Another example of specialized maintenance activities which could have a positive impact on the development of engineering industries are those associated with oil field operations and large oil refineries. A central maintenance activity for periodic inspection and maintenance established as a private joint venture with a foreign specialized partner has been serving the petroleum-processing sector in the Gulf area. Another attempt in this direction is the establishment of a maintenance services company initiated by OAPEC to cater to its member States' needs (Arab Company for Petroleum Services).

52. Technological infrastructure to serve the capital goods industry within the region includes academic and technical institutions. Technical institutions for formal training of technicians (mechanics, electricians, tool-pushers, laboratory technicians, masons, fitters, etc.) have been established in most countries of the region, with varied degrees of course intensity and apprenticeship. While most of these institutions have failed to attain their goals for different reasons, a few seem to have survived the pressure and have been operating effectively over a long period of time. More recently, some countries have been endorsing the links between these institutions and the industrial sector.

53. On a regional level, technological training programmes mostly specialized in one subsector or another have been planned. Some of these programmes which are destined to prepare and upgrade skills at various levels and specializations in a particular sub-branch, have been institutionalized with long-term recurrent courses and short-term, sometimes ad hoc courses. Such a programme is the one initiated by OAPEC which resulted in the establishment of the Arab Petroleum Training Institute. Among its subprogrammes, this institute offers courses in maintenance and services, process operation and production, testing and control, inspection and surveillance.

54. On the project engineering side, civil engineering construction activity in respect to industry has been handled by private, national or regional enterprises, but predominantly by international firms. The mechanical-electrical engineering side of this activity has been confined to erection of plants, handl-

ing of construction equipment, welding and on-site installation of components and ancillaries. For almost all large projects, project management has been assigned to a main contractor, usually from a developed country, to handle all activities including engineering design, procurement and construction on a turn-key basis. Other types of contracts awarded to foreign firms for the execution of projects include lumpsum contracts for engineering services and co-ordination of major sub-contracting activities and cost-plus contracts for different engineering and contracting management functions including inspection and commissioning.

55. Most local engineering contractor's activities related to industrial projects have been confined to civil engineering. Recently a few local engineering firms have been involved in sub-contracting mechanical erection and electrical installation for large industrial projects. Only in a few cases, and mostly for small-scale industrial projects, have these firms involved themselves with procurement of major equipment. The experience gained in this area has been confined mainly to static and steel structure as well as common and package units for processing and utilities.

56. The technological capacity to procure and handle capital goods has not yet developed within the region to the point of self-reliance. The present trend in industrial project implementation has resulted in slow progress with respect to the national capacity in unpackaging relevant technology, a fact which allows the involvement and development of indigenous capabilities and national or regional inputs and activities; i.e. integration of local resources, using one's own inspection procedures and standards, utilizing national engineering bodies for further development, etc.

57. Most recently, DAPEC initiated the establishment of a project engineering body to serve the petroleum-process industries in the Arab World. The Arab Company for Engineering Consulting and Design is already engaged in the execution of certain industrial project contracts, although sometimes in association with international specialized firms.

B. Salient features of the technology transfer process in the ECWA region

58. Based on the above presentation, the salient results of the efforts of the ECWA member States can be summarized as follows:

(a) Generally speaking, while considerable awareness of the importance of technology in the development process prevails within the region, full understanding of the prerequisites for the transfer of technology has not yet been attained resulting

in an insufficiently co-ordinated procedure for developing the basic components of the process, i.e. technological manpower, technological infrastructure, technological tools (equipment and services) etc. The degree of understanding of the problem varies from one country to the other depending on its level of socio-economic development;

(b) The extremely huge volume of developmental, particularly industrial, projects which have been implemented during the second half of the past decade within the region was achieved with less emphasis on priorities in respect to technological development needs than to other socio-economic components. In many instances this resulted in a high demand on inputs, drawing on all local and regional resources, irrespective of quality. In most countries, and particularly in the Gulf region, that behavior resulted in severe constraints that, among other things, slowed down the process of developing the basic technological components;

(c) The relatively great number of industrial projects implemented within the region relied mainly on imported technology (services and equipment) whose in-flow has not yet been regulated by an explicit technology programme and by policy plans whose main objective would be the development of technological capacity and the achievement of a higher degree of technological self-reliance;

(d) In the process of institutionalizing technology transfer within the context of their development plans, certain countries did not really take the necessary steps to assess the impact of specific technologies or of related technology transactions (acquisition) and unpackaging procedures on social behavior and their contribution to particular development needs;

(e) The development of technological capacity in most ECWA member States during the past two decades, has been the result of fragmentary efforts, although some attempts were made to incorporate them within a total framework for national action, and even for regional action wherever applicable.

(f) The appreciation of regional co-operation for technology transfer has led to the establishment of a few joint projects whose aim includes the upgrading of technical skill and a modest breakthrough into the self-imposed monopoly on technological services of the international suppliers and engineering companies specialized in executing engineering contracts. Such efforts have not yet been supported by such important features as the establishment of capital goods for major and important industries especially in important fields and sectors i.e., energy, chemicals and petrochemicals etc.

(g) Although academic and training institutions are being developed on a national basis, the negotiation capacity of most ECWA member States still needs strengthening by introducing practical specialized training programmes on a recurrent, continuous basis to upgrade the technological capacity of engineers and to keep them abreast of all technological developments in specific areas. This can be achieved not only through training, but also through co-operation on a regional as well as international basis, particularly in regard to technical data and information on technologies, contracts etc. To accomplish this the line of action would include the establishment of appropriate mechanisms on a national as well as regional level to forecast, monitor and assess technological trends and their implications for economic and social development.

C. Issues for discussion and further consideration

59. Based on the previous discussion, the following points need to be discussed in detail with a view to developing a plan of action to augment the ongoing efforts to strengthen scientific and technological capacities for industrial development in the ECWA member States.

(a) Institutionalizing science and technology as a major component of the development process is an important task which must be undertaken by each country. A prerequisite for such an undertaking is the assessment of the impact of the previous pattern employed in the process of technology transfer on the socio-economic development in each country. Such assessment will be an important factor in defining the future pattern and needed legislation and plan of action. To achieve this, a co-ordinated programme has to be developed by each State according to its socio-economic structure and level of development, with a focal point to polarize all relevant activities and to communicate on the national as well as regional level with all concerned agencies to obtain information, exchange views and pave the way for co-operation for improving the situation by capitalizing on the limited resources and utilizing the results of different experiments;

(b) To augment the above-mentioned policies and plans in respect of developing technological infrastructure, ongoing national as well as regional programmes ought to be assessed and strengthened. Furthermore, achievement of relevant regional programmes and institutions should be evaluated in the light of their mandate and potentials to determine the degrees of their involvement in an integrated modest programme for assessing the technological capacity on a regional level. Relevant institutions include: Arab Federation of Scientific Research Institutes; Federation of Arab Universities; Arab Industrial Development Organization; Gulf Organization for Industrial Con-

sultancy; Arab Petroleum Training Institute; Arab Petroleum Engineering Company; Organization of Arab Petroleum Exporting Countries; Arab Organization for Standards and Measurements.

(c) Training and upgrading of technical and technological skill remain a priority task of any plan of action. Efforts are never enough in this respect. Initiation of training programmes should always be based on needs on a national as well as regional level. In the more advanced countries the needs will materialize from within, based on the progress attained on a sectoral level and the potential for development. Hence countries with similar features and/or parallel industrial programmes could have a joint training programme of their own. For example, a programme for major oil-exporting countries with upstream/downstream industries; a programme for countries involved in basic agro-industries; a programme for countries with a good base in engineering industries etc. These programmes may be sponsored by the State most concerned, but shall be open to qualified nationals of other countries. Such programmes may be organized in co-operation with, and technically assisted by, regional and international organizations. An important contribution to such programme may come from developing countries outside the ECWA region. In the least advanced countries, a subregional continuous training programme may be initiated to which the more advanced countries within the region would be the major contributors on a sectoral basis depending on their competence in that field. Such a programme could be managed by a specialized regional organization or a group of such organizations such as ECWA, AIDO etc. in co-operation with the concerned or financing State;

(d) ECWA has developed and implemented specific programmes in relation to the technology transfer process within the region including:

- (i) A brief study on the status of technology within the region with a view to formulating a continuous programme to assist the member States in their drive to improve their technological capacity;
- (ii) A series of training programmes which have been implemented successfully for the development or upgrading of negotiation and technological skill in the member States;
- (iii) A series of feasibility studies for the establishment of relevant capital goods industries to augment the technological independence process.

Thus ECWA could play a positive role in the identification of all factors related to the above issues and in the implementation of relevant programmes.

III. ACCELERATED DEVELOPMENT OF HUMAN RESOURCES FOR INDUSTRIAL DEVELOPMENT IN THE ECWA REGION

1. It has been argued that in the development efforts of a country, quite often, development of material and physical structures has been overvalued while human resources development has been comparatively undervalued. Till very recently development plans of most ECWA countries fell under such a description; the situation is only slowly changing and more consideration is being given to human resources development as an integral part of industrialization plans. A number of countries of the region, such as Iraq, have already reviewed their educational systems and programmes to give more stress to vocational and technical education. Training institutions are becoming more established and more effort is being exerted to link education to industrial needs. More comprehensive national development plans are emerging that include programmes to develop human resources in accordance with industrialization programmes. Eventually countries of the region should seriously consider adopting the approach of human resources-led development plans.

2. Human resources-led development strategies consider the human element as important as material and physical structures. They involve systematic efforts to raise the skills, productive capacities, creative abilities and enterprising spirits of the national population, through social research, training and retraining, education and continuous education, etc. These strategies are seen to provide the most effective vehicle for technology transfer and the creation of indigenous technological capabilities in the region, through:

(a) Integration of women labour and the rural population in the development process;

(b) Re-evaluating traditional technologies and upgrading local skills;

(c) Encouraging entrepreneurial activities;

(d) Fostering the development of small and rural industries.

3. It is important to note, however, that all countries of the region are not facing identical problems regarding human resources development. One may distinguish a few regional sub-groups: (a) the Gulf States, rich in capital and natural resources, but with limited population; (b) the non-oil-producing countries with large human capabilities and skills that can be made available to other countries of the region (i.e. Egypt, Syrian Arab Republic, Jordan, Palestine, and Lebanon); (c) Iraq standing alone as a country rich in natural

resources and with an adequate population size for normal development plans, but requesting more human skills to cope with accelerated development plans; and finally (d) the two Yemens, the least developed in the region, poor in natural resources and with a limited skilled labour force, which need to be developed at an accelerated rate to satisfy local needs.

4. The problems of human resources development vary drastically between the different subgroups of the region. National development plans have to be based on the specific characteristics of each country. Serious regional development plans should consider the variable characteristics of the subgroups and address the problems in each of them. There are, however, many aspects common to the whole region, which allow this paper to address the major issues facing the region as a whole; in particular, to a great extent, the region represents a common regional skilled labour market.

A. Past experiences and current trends

5. Very early after political independence, most countries of the region recognized the need to develop their educational systems and they have been allocating large portions of their national budgets to education and its expansion. Elementary education has been compulsory for some time, secondary education has expanded more than tenfold in the past decade or two, and several new national universities and higher education institutions have been established throughout the region. Education for women has expanded at tremendous rates as well so that there is hardly now any remote village in the region where one cannot find at least one school open to the education of girls. Separate universities have been established for women, or in countries where co-education is still socially unacceptable, separate sections in universities have been established. Fellowships, scholarships and other assistance are being given to more and more women to continue their education outside the region.

Number of students in different branches of education in the ECWA countries, 1981

Country	Population (thousands)	Academic education			Industrially-oriented education			
		Elementary	Secondary	University	Colleges		Universities	
					Vocational	Technical	Technical	Professional
Bahrain	359	46 000	19 000	1 300	2 200	1 583	637	-
Democratic Yemen	1 853	213 000	65 000	-	1 223	216	?	?
Egypt	40 460	4 151 000	2 283 000	493 000	49 300	?	10 511	47 489
Iraq	12 816	2 609 000	951 000	98 000	56 584	38 000	14 410	18 300
Jordan	2 984	448 000	248 000	37 000	9 117	25 275	2 303	986
Kuwait	1 355	125 000	140 000	12 500	167	1 850	740	825
Lebanon	3 056	500 000	180 000	45 000	2 590	?	?	2 773
Oman	839	84 000	11 000	-	456	-	-	-
Qatar	230	28 000	14 000	2 600	123	1 850	-	-
Saudi Arabia	8 678	862 000	340 000	47 000	7 785	321	283	5 400
Syrian Arab Republic	8 100	1 481 000	564 000	74 000	28 440	4 859	526	1 154
United Arab Emirates	140	80 000	26 000	1 700	392	-	-	-
Yemen	7 078	589 000	47 000	6 000	1 669	-	-	-

Source: Arab Federation for Technical Education, 1982.

6. The fact remains, however, that expansion in education has not generated the manpower required for industrialization. There are many factors that have contributed to such a contradiction, but the main factor is that planning for education has been conceived in isolation from industrialization or to overall national development plans. Eradicating illiteracy has been considered a national objective, and attending school, even university is considered a right for every citizen regardless of the manpower needs of national development plans. In many countries, the expansion in education has been a response to the ever-growing number of students, and it has resulted in an abundance of university graduates in certain fields and a scarcity of manpower in others.

7. Another important factor that has led to the failure of educational expansion to respond to manpower needs, is that the educational systems in most countries have been inherited from colonial days. In these systems, theoretical and academic education predominates over vocational and technical education, and theoretical knowledge has been developed at the expense of serious consideration of practical training and skills. It has only been in the late 1970s and early 1980s that some countries of the region have started to seriously review their educational systems, and to give more attention to vocational and technical education, after it was realized that the availability of technically-skilled manpower was the main bottle-neck facing most industrialization plans. However, all countries of the region must review their education plans to incorporate more practical and vocationally-oriented programmes as integral parts of all academic education.

8. Owing to the high cost of equipment for practical courses, laboratories and technical training, colleges and universities, except in richer countries of the region, have tended to expand more in departments of humanities, art, literature and social sciences, with much less expansion in technical and professional education. As a result, there has been an increase in the number of university degree holders in specializations not directly related to industrial development. The requirements for industrial manpower have not been satisfied and at the same time there is a mass of unemployment or redundancy gaps in the marginal specializations mentioned above. On the other hand, universities in rich countries of the region are being furnished with lavish equipment for labs and educational aids, but their curricula are, most of the time, tailored to those in advanced universities and thus are not related to problems facing local industries.

9. The distribution of students in the educational systems in the region is still overwhelmingly favouring theoretical and academic education at the expense of industrially-related education as shown in the table below. The main factors that are

still contributing to such an imbalanced distribution may be summarized as follows:

(a) The prevailing social and economic values which still favour desk and white collar tasks over hand labour and blue collar tasks;

(b) The attitude toward education which is still not organically linked to development, and is not looked upon as an economic investment with a return that should be evaluated and assessed;

(c) The complexity and higher cost of industrially-oriented education as compared with theoretical and academic education;

(d) The shortage of well-qualified technical instruction and trainers, the lack of capabilities and mechanisms to evaluate the performance and suitability of different types of education, and the absence of plans and channels to improve the prevailing systems;

(e) The absence of a clearly-stated objective for education and the lack of understanding of the role of industrially-oriented education in the overall development plans of a country;

(f) The lack of an industrial base and infrastructure that would create pressure towards a greater share for technical education and that could provide guidance and experience for such education.

10. Educational systems in many countries of the region have been designed to be similar to those prevailing in advanced universities in industrialized countries; these systems, however, have proven to be irrelevant to the region's needs and irresponsible to the changing conditions of local industrial enterprises. A big gap exists between industry and development planners on the one hand, and educational institutions on the other. Graduates of local universities are not prepared to cope with problems they face at local industrial enterprises, particularly when local industries lack the support of an infrastructure and an industrial service base. Most educational institutions prepare their graduates for further education in advanced countries rather than to face the problems of local industry.

11. In addition to what is stated above, it is to be noted that the lack of infrastructure, industrial base and support services deprives students at local institutions of essential industrial experience. Moreover, new graduates, placed in newly established industry, are usually faced, without senior guidance or industrial traditions, with problems of various nature which are

not necessarily related to their immediate specialization; they may be expected as well, to take over tasks usually undertaken by high technicians or foremen. Local educational systems ought to be reviewed to better serve local industries, to provide their graduates with more rounded and versatile training, to encourage initiative and creativity, to provide necessary general background information, and to encourage research and further study so that unexpected problems can be dealt with.

12. Secondary level education, in most countries of the region, was inherited from colonial days, with minor modifications. It is usually not designed to provide a well-rounded product with worthwhile skills for absorption in industry or for entry into professional careers. Practical courses and lab work are reduced to a minimum, while workshops and vocational training are practically completely lacking in regular academic programmes. Vocational schools are usually very limited in capacity when compared with the huge number of students in academic schools. It is to be noted that in advanced countries, practical training, labs and workshops have become essential parts of regular academic programmes covering up to 50 per cent of student time at school. A re-examination of secondary education is of utmost importance for providing an education that prepares students to face problems of their daily life, and to encourage them to link what they learn at school with life outside the classroom. Moreover, secondary education should implant in the students the spirit of a continuous search for learning and for continuous education. Students that leave school at any stage should have the incentive and the capability to acquire new knowledge and to adapt their knowledge to new skill requirements throughout their working life.

13. It is clear, therefore, that because of the unsatisfactory results of traditional educational systems in developing the requested human resources for industrialization, there must be a new approach, based on the concept of human-resources-led development. Educational systems must be strongly linked to development plan and to local industries. They must be regularly reviewed and changed to suit better the changing realities of growing industry. They have to undergo rationalization and qualitative improvement. They must change in form, content and method.

14. The prevailing trend in the region is for education and acquisition of knowledge to stop practically after one leaves school. The largest majority of the skilled labour force in any country is not usually exposed to new knowledge or skill except may be on the occasion of introducing a new machine or a new technique. The concepts of continuous education, on-the-job-training, retraining and rehabilitation, self-enhanced learning, etc. are only newly diffused in a few countries of the region.

15. The large number of school-leavers after secondary education, as shown in the table below, and the large percentage of university degree holders in non-requested specializations on the one hand, and the need for skilled labour, the fast-changing nature of technology, and the ever-growing need for newer skills for new technologies and techniques on the other hand, lead to the necessity of a large-scale programme for training, retraining, rehabilitation and on-the-job training. Such a programme must be an important part of every human resources development plan in the region, as is the case in advanced countries, where the rapidly evolving advanced technologies have made many skills obsolete and have forced a large portion of skilled manpower to learn more needed skills; this is particularly true in such fields as computer sciences, micro-electronics component manufacturing and production of electronic telephone exchanges, and micro-computers.

16. There is a serious lag between the level of scientific and technical knowledge prevailing in societies of the region, and that prevailing in advanced societies which forms the base and the atmosphere for a continuously rejuvenated skilled labour force in those societies. There is, therefore, a need for the continuous circulation of scientific knowledge, and information about new innovations and new techniques, to all age groups and all levels of the population. The provision of scientific literature, in all forms and in the Arabic language, is an important factor in the development of human resources in the countries of the region; moreover, it is necessary to undertake production and distribution of such scientific knowledge through newspapers, journals, books, educational materials, public libraries, radios, TVs, videos, science centres, science museums, etc.

17. Many newly-established industrial enterprises have resorted to recruiting among those practicing in advanced countries or to training their skilled personnel there. Where training has been received in advanced countries or in imitative westernized local institutions, it has often resulted in an elitist, alien attitude and a life-style not rooted in prevailing traditions; such training thus fails to respond suitably to problems facing local industries.

18. Practical experience gained in advanced societies is extremely important for developing human resources in the countries of the region and it is an important channel for transfer of technology, particularly when it comes to advanced technologies; however, such experience has to be adapted to the realities and capacities of local societies. It is proposed that mixed training programmes should be formulated, in which a trainee may undertake part of his training in an advanced country, go back to work in his own environment for a meaningful period

of time to apply what he has learned and to identify problems and areas where he may need further skills and training, then continue his training programme with some idea of all the problems he is likely to face when he again returns. Another alternative is to have joint teaching and training programmes between local institutions and advanced ones.

19. An important aspect of the region's experience in developing human resources is that, to a great extent, the whole region has been forming practically a unified regional market for skilled labour whereby a large number of skilled personnel trained and developed in one of the non-oil producing countries have been working in one of the rich oil-producing countries. This complementarity has to be developed to the benefit of the region. A regional pool of skilled personnel has to be developed with oil countries carrying part of the burden of training labour in non-oil countries, and in return the latter elaborating training programmes more suitable to oil countries.

20. The issue of women in the labour force has gone through different stages in the countries of the region. At the early stage, in most countries, women were excluded from most jobs, particularly from industry, with the expansion in women's education and the severe need for skilled labour, women slowly started penetrating the labour market in one country after the other. It can be said now that many countries (Iraq, Syrian Arab Republic, Lebanon and Egypt) have come to a stage where women are fairly well integrated in the labour force even in industrial jobs; however nowhere have women been fully mobilized.

21. The integration of women, even in those countries mentioned above, into the skilled labour force has not taken place without reverses owing to the social realities of the region. Many highly-qualified skilled women were withdrawn from the active labour force owing to social constraints, or were restricted to less relevant tasks, thus valuable resources have been wasted training.

22. The development of women resources, particularly in countries of small population, is important for the realization of the full capabilities of a country. Many industries such as electronics industries and the assembly industry in which women's labour dominates worldwide have had higher productivity with women's labour. Special consideration has to be undertaken to enhance the integration of women's labour in the industrialization plans in the region; however, special care has to be given to social realities to avoid reverses and the waste of valuable resources.

23. Another factor hindering the development of human resources in the region is "the brain drain". Large numbers of skilled

labourers and high-qualified experts are choosing to work and live in developed countries. Recent statistics have shown that 30 to 40 per cent of students from certain countries (Egypt, Palestine and Lebanon) decide to stay in the country where they were studying, rather than return to their home countries. Migration of established qualified personnel from most countries of the region is not uncommon. It is estimated that the community of qualified personnel from the region living in developed countries may compare in size to that still living in the region, and may be larger than the skilled labour force in any one country. Individually, a few countries have tried to reduce the trend (Iraq and Saudi Arabia) by laws and incentives offered to qualified personnel who decide to return; many studies and seminars have been undertaken to analyse the problem and recommend solutions. It is clear, however, that the trend has not been reversed and more serious measures are needed to deal with the problem. "Brain drain" causes a double loss to the countries of the region, for not only qualified personnel are lost, but important scarce resources have been wasted on their education and training.

B. Issues relevant to the ECWA region

24. The issues discussed above are, by no means, inclusive. They cover factors that have had immediate and tangible effects on the development of human resources in the ECWA region. There are, however, many more issues to be considered in a serious planning for human resources development. Some of the more relevant issues are outlined below:

25. Involvement of rural population: In many countries of the region the majority of the population is still living in rural areas in which there is only a limited contribution to the development of the badly needed skilled labour force. Many countries have implanted elementary education even in the farthest rural agglomerations; higher education institutions have also been established at many rural centres. But the rural population is still far from being active in the industrialization process.

26. The question remains of how to develop the full potential latent in the rural population. Some of the suggestions in this respect include: adaptation and upgrading of traditional technologies, fostering small and rural industries, establishing rural technology centres, distribution of industrially-oriented education institutions in rural areas, etc.

27. Planning capabilities: As mentioned above, successful development of human resources needs serious planning to eliminate mismatch between products of educational systems and needs of industry on the one hand, and to synchronize supply and

demand of the scarce skilled labour force on the other. Planning for human resources development is a skill of its own, which needs to be developed to assist decision-makers and to create within the country indigenous capabilities for autonomous policy-making, capable of absorbing and planning for the special characteristics of each country. Planning skills include such capabilities as those which can link educational expansion to industrialization projects and to national development plans, and involve identification of industrial growth modes, institutional infrastructure, mechanics of planning etc. Successful planning involves the following skills:

(a) Collection of relevant information on industrial enterprises, industrialization projects, educational systems, population growth, and the evaluation of collected information;

(b) Access to sources of technologies and scientific knowledge, and the capability to compare alternate technologies from the human resources needs and development point of view;

(c) Defining clearly objectives of human resources development plans, and relating these objectives to educational and training and retraining programmes and capabilities.

It is important for planning institutions to have close working relations and a free flow of information with industrial, administrative and educational institutions.

28. Development of specific skills: In planning the development of human resources, some relevant skills have been neglected or given lower priorities, though they are critical in the success of any industrial venture. Among skills that ought to be developed one may list:

(a) Local technical, industrial and design consultancy capability to assist in formulation and preparation of projects, their specifications, choice of technology etc.;

(b) Industrial management skills at all levels of industrial processes;

(c) Entrepreneurial capability, that can bridge the gap between available investment and industrial opportunities;

(d) Training of technical trainers, development advisers, industrial relations personnel etc;

(e) Creative industrial research to improve products, increase productivity of processes, relate and upgrade traditional technologies, substitute for lacking infrastructure, new technologies and techniques etc.;

(f) Repair and maintenance capabilities with initiative and innovative techniques, to cope with diversified sources of technology, and to substitute for expensive imported maintenance services and spare parts.

29. Consideration for advanced technologies: Special consideration should be given to the rapid diffusion of advanced technologies and applications in the region, particularly innovations in computer applications. Planning for human resources development should accommodate these technologies and benefit from them. The diffusion of advanced technologies, such as micro-electronics and applications, is affecting more and more the nature and size of needed skills in industry and business, as well as the concepts and techniques of education and training used in the development of human resources, particularly after the introduction of the computer even in elementary schools. Planners of human resources development have to address new challenges posed by techno-scientific advances: their unprecedented speed, their rapid and pervasive diffusion and the drastic change they bring about to the social, economic and industrial structures of a country.

C. Recommended action at the national level

30. A number of recommendations concerning the development of human resources in the ECWA region have already been discussed above. Some of the more relevant ones are repeated below, along with further suggestions for action at the national and regional levels.

31. Planning authorities in each country are called upon to consider the following:

(a) Restructuring the educational systems towards increasing the size of industrially-oriented education;

(b) Reorientation of academic educational curricula and techniques to integrate practical courses, workshops etc;

(c) Modernization of teaching aids and techniques to substitute for scarce good teachers and instructors;

(d) Elaboration of continuous education programmes, including on-the-job training, retraining of teachers, workers and managers etc.;

(e) Elaboration of special training and retraining programme to "convert" less wanted skills into more needed skills. In particular the elaboration of special retraining skills so that personnel from countries in the region can spend on-site training periods working in institutions in advanced countries;

(f) Developing close links between schools, training establishments and universities on the one hand and planning machinery and industry on the other, and encouraging mobility of personnel between industry and academy;

(g) Developing closer links between research institutions and industry, and establishing industrial research centres and supporting services;

(h) Assisting in setting-up qualified teaching and training companies, open universities etc.

32. Governments interested in the development of human resources should allocate enough finances (some countries allocate up to 2 per cent of GNP) to the development of human resources. Channels must be created for industries to participate in such efforts, e.g. 1 per cent of wages should be set aside for training, on-the-job training, and retraining of the labour force etc.

33. Legislative or administrative actions that may be undertaken are:

(a) Matching permission for new industrial ventures with the training of local personnel to take over most skilled tasks within a reasonable time;

(b) National expertise to be utilized whenever available, including the design and implementation stage of any new venture;

(c) Balancing expenditure of new projects to provide adequate resources for preparing the required manpower to operate, manage and maintain new equipment and processes;

(d) Making provision, in joint ventures, for training local personnel in feasibility studies, design, construction, start up etc;

(e) Organizing exchange programmes with advanced governments and institutions to exchange information, instructors, designers and managers, etc.

D. Recommended action at the regional level

34. Infrastructure and programmes needed which cannot be developed solely on a national basis require regional action at the governmental and regional organizations' levels.

35. Many countries in the region, (Egypt, Syrian Arab Republic and Iraq), have accumulated experience in industrialization and

in the development of needed human resources. These countries may offer technical assistance to lesser developed countries in these fields, particularly by identification of national institutions capable of providing education and training to personnel from other countries, identification of local technical consultancy firms capable of offering regional services, assistance and exchange programmes etc.

36. There is a need to establish regional centres of excellence for training, education, maintenance and technical consultancies etc. Many such centres have been established such as the Arab Institute for Petroleum Training, Arab Planning Institute, Gulf College of Technology etc. In particular, there is a need to establish regional centres to train technical trainers and to produce technical educational aids.

37. Regional co-operation and co-ordination institutions concerned with the development of human resources and industrialization should be strengthened. Examples of such institutions are: the Arab Federation of Technical Education, Federation of Arab Universities, Federation of Arab Scientific Research Councils, Arab League Educational, Cultural and Scientific Organization (ALECSO), Arab Industrial Development Organization (AIDO), Arab Labour Organization (ALO), Arab Education Bureau of the Gulf States etc. as well as regional professional institutions, such as the Federation of Arab Engineers, Federation of Arab Teachers, etc. These regional institutions should take an active role in planning and implementation of regional efforts in human resources development.

38. Regional technical services, such as regional consultancy services, regional training companies, regional repair and maintenance services etc. should be established. These services will enhance not only regional co-operation but also local expertise and skills.

39. National plans for development of human resources should be linked organically to industrial and economic development plans, taking into consideration regional complementarity and the realities of the common regional market of skilled labour. In this respect it is advisable to consider the possibility of distributing industrially-oriented educational institutions among the countries of the region to secure proper implementation of regional plans to develop human resources. With rich countries contributing to finance institutions in poorer countries and with all programmes of these institutions planned to respond to regional needs.

40. In this respect it is recommended that a regional inventory of skilled manpower available in the region, and one for skilled manpower originating in the region but working abroad should be organized.

41. A review of educational and training systems may be necessary to enhance practical courses and, to update educational techniques and educational aids. A regional centre may be created for production of educational materials and training aids etc.

42. ECWA and UNIDO, as special regional and international organizations concerned with the development of human resources for industrialization in the region, can provide assistance including:

(a) Identification of priority areas for industrial education and training and identification of industrial manpower needs;

(b) Preparing an inventory of innovative training and educational tools and techniques and where and how they can be acquired;

(c) Preparing an inventory of selective international training centres and how one can enrol in them;

(d) Placement of qualified nationals at selective advanced industrial institutions for on-the-job training, via actual participation and work with their counterparts;

(e) Elaboration of work programmes for development of human resources including organization of training workshops, informative seminars, familiarization courses on accelerated development of human resources etc. and, in particular, implementation of measures to ensure a greater multiplier effect of these programmes such as training of trainers, technical supervisors, managers, technical consultants etc.;

(f) Elaboration of work programmes specially oriented for retraining and for "conversion" of less needed skills into more needed skills;

(g) Organization of exchange programmes between institutions in the region and their counterparts in advanced and developing countries.

IV. ENERGY AND INDUSTRIALIZATION

1. In the past few years energy demand has become a matter of real concern in the ECWA member States, particularly in the non-oil-producing countries, in view of the increasing energy consumption growth rate and rising energy costs as a result of steeply rising international oil prices. The tremendous increase in energy consumption in the region has been attributed mainly to the large development programmes, particularly in the industrial and transportation sectors. The improved standard of living, the continuous migration from rural to urban centres and the transition from agriculture to industry which has been accompanied by a shift away from traditional non-commercial energy consumption are added factors in increasing the demand on energy.

A. Oil and natural gas

2. The major sources of commercial energy in the ECWA region are oil and natural gas representing over 90 per cent of the total energy requirements, followed by hydroelectric energy. Coal represents a very small percentage and statistics on non-commercial (mainly solid) fuel, such as biomass, are not available.

3. Natural gas, mainly associated gas produced in conjunction with crude oil, is gaining a higher momentum in consumption growth rate than crude oil in oil-rich countries, particularly in the Gulf subregion. One of the reasons why the shift toward gas marketing has been mainly at the national level is the high investment needed for its transportation to non-oil States or to international markets. However, international natural gas marketing programmes are being implemented by Kuwait, Qatar, Saudi Arabia and the United Arab Emirates, and full utilization of the associated gas has not yet been attained. The bulk of the associated gas is directed towards the industrial sector as an energy source and as feedstock for nitrogen fertilizers and petrochemicals, on a national level. The most recent trend in its utilization has been toward manufacturing and international marketing of methanol as an important energy carrier/source.

4. Natural gas is not utilized for domestic energy except in housing complexes located near oilfields. However, it is used widely for power generation and as a main energy source for desalination plants in the oil-rich countries.

5. Crude oil remains the main source of energy for the ECWA region as a whole, with petroleum refineries established in all member States except one (Yemen). Currently, in six of the 13 ECWA member States, the refining capacity exceeds the domestic

(national) demand, and all six States are exporting refined products. More refining capacities are expected to be installed within the next fifteen years for export purposes and to meet the expected increase in domestic demand.

B. Electrical energy

6. The electrical energy sector in the ECWA region experienced rapid growth during the 1970s and its high growth rate is expected to continue during the 1980s since the consumption per capita is still below the world average. Discrepancies between per capita consumption in different ECWA member States do exist, with the Gulf oil-producing States having the highest level of consumption.

7. Electricity generation depends largely on firing crude and heavy fuel oils and gas with hydroelectricity. It has reached a significant level in four countries, namely Egypt, Iraq, Lebanon and the Syrian Arab Republic. Electricity networks are still limited in many countries, but efforts are being made to expand the present grid-systems on a national level. Steps have been taken to develop a pan-Arab interconnecting network operating on extra-high voltage within the region. A modest programme in this respect is being implemented by at least two ECWA member States. There is, however, large room for further action.

8. In general, the electricity sector within the region suffers from the lack of skilled technicians and managerial skills. There is also a lack of capital in non-oil-producing countries where the high tariffs result in a heavy economic and social burden. On the other hand, low electricity tariffs in oil-producing countries lead to wastage of energy and national resources. Such an imbalance warrants collective action on a national as well as a regional level to remedy the situation in the light of the more appreciated trends in energy conservation and the continuous growth in energy consumption expected between now and the end of the century.

9. An important issue that needs serious consideration is the need for standardization and regulation and for unified voltages. In this respect one must note the region's low level of capital goods production of power generation and distribution equipment to cope with the current and expected increase in the demand for electricity.

10. The lack of natural fresh-water resources in the Gulf Arab States has made it imperative that dual purpose stations for electrical power generation and sea-water desalination are installed in many locations. In assessing the technical and economical aspects of such stations, it has been found that, in most cases, they will lose their economic value. However, it

should be noted that the technological experience gained in such places as Kuwait is a positive step which may prove to be valuable in the long run. Further studies are needed to evaluate the interrelated factors of the dual-purpose stations to determine their optimal economic use.

11. The use of nuclear energy for electric power generation has not yet been established, but it is foreseen for the future as an alternative for oil and gas fired power and/or desalination plants. Accordingly many countries have been seriously thinking of developing a realistic nuclear power development strategy based on a thorough examination of different scenarios for future total and electrical energy demand on a domestic basis. Many countries have noted that capitalize on existing technological resources a collective effort is needed whereby experience can be developed probably with one project within the region as a starting point in the near future in order to be in a position to meet the situation when oil and gas reserves are nearing the depletion stage.

C. Solar energy

12. Most of the area of the ECWA member States falls within the "solar belt". This fact has led to a growing interest in solar energy, and quite a few countries have initiated certain activities for its utilization. In general, these activities are not well co-ordinated among those countries and in some cases they are not co-ordinated among different departments within the same country.

13. Rural applications of solar energy are already under way and economically competitive and practical, as is the case with solar drying of fruit vegetables etc. and solar desalination in remote areas. The same can be said about domestic applications (e.g. water heaters) in certain urban locations. For other applications such as solar pumps which are still expensive, solar greenhouses and solar production of mechanical energy and electricity, further research work and improvement are needed.

14. Research and development programmes for solar energy applications are under way in several countries. Some independent as well as some joint research activities are under way in different States. In some cases, the work is conducted in co-operation with foreign countries. Most of these activities were initiated in the universities, and the bulk of the solar energy budget is drawn from the budgets of the academic institutions and/or specialized government agencies, i.e., Kuwait Institute for Scientific Research (Kuwait), Baghdad University (Iraq) etc.

15. Solar energy laboratories have been established in Egypt, Jordan and Kuwait. Others are being planned in Iraq and Saudi Arabia. Some countries (i.e., Iraq, Lebanon, Saudi Arabia) have assigned government bodies to form commissions to oversee all solar energy activities.

16. The most popular research work in the ECWA member States has been directed toward the use of solar energy for space heating and cooling. Relatively large projects in this area are being implemented in Saudi Arabia. Similar projects are being developed jointly by Kuwait and Jordan. Jordan is probably the most advanced country within the region in the area of low-temperature heating. This country has also launched a water desalination project in Aqabah. Similar, but smaller projects have been implemented by Saudi Arabia and Iraq, while basic research in this area is being carried out in Egypt and Kuwait.

17. Another area of solar energy application is crop drying which has been investigated by Egypt, Iraq and Lebanon. Egypt is also investigating the use of solar energy in operating a cold-storage facility. But solar pumping has not yet been seriously investigated. Although some countries have imported solar pumps, in general those pumps need modification for use in desert regions.

18. The main feature of the activities related to solar energy applications in the ECWA region is that they have been relying on imported technology. For appropriate indigenous technology, it is essential to develop Arab expertise in research, conception of solutions, design, manufacturing, marketing and training of manpower for operation and maintenance.

D. Wind energy

19. Wind energy has been utilized on a very limited scale in Egypt, Kuwait, Lebanon and Saudi Arabia for water pumping using wind turbines. Some of those turbines that were installed long ago have been scrapped owing to the lack of spare parts and technicians able to maintain and repair them, and to their inefficiency because of inadequate design. But the main reason for not having new and more wind turbines installed or used is the low price of fuel for diesel engines.

20. Some countries are showing some interest in wind energy after realizing its prime importance for small and desert rural communities located far from electricity utilities. In many places in those countries animal and human labour are still utilized to pump underground or surface water for irrigation, watering cattle and other agricultural uses. Some research work related to these uses is under way in some ECWA member States, namely, Egypt, Kuwait, Oman and Saudi Arabia.

21. The potential for developing a programme for wind energy applications for water pumping is quite promising in many rural and desert parts of the ECWA region, depending on wind conditions, depth of underground water and method of irrigation, and the availability of technical capabilities and spare parts. Of course, one has to consider the environmental and social impact of developing such a programme.

22. Previous studies on the subject have indicated that wind energy utilization is promising in desert and rural areas, especially in areas located not very far from the coast. An ECWA study has pointed out that the annual average wind-power density in selected areas (in Egypt, Kuwait, Qatar, Saudi Arabia) ranges between 170-200 watts per square metre. With the exception of limited R & D work in Egypt, Kuwait and Saudi Arabia, no serious projects are being pursued to determine further the viability of wind energy utilization within the ECWA region.

E. Geothermal energy

23. The diversity of geological conditions in the Arab countries suggests the possibility of different types of geothermal resources. A preliminary study carried out by ECWA points out that high enthalpy resources allowing electricity production from large-sized power plants may exist in Saudi Arabia, and to a limited extent (or smaller amount) in Democratic Yemen, Jordan and Egypt. Medium enthalpy resources which could supply conversion units for air-conditioning, deep-freezing, drying, water desalination plants and small-sized power plants for electrical needs of small remote areas may exist in a limited number of countries where medium-temperature deep wells and thermal springs do exist. But this suggestion has not yet been substantiated. The same can be said about the viability of low-enthalpy resources that can be used for direct heat production.

24. According to the above-mentioned study, a few Arab countries are involved in geothermal R & D programmes and have established specialized institutions for this purpose. Serious efforts in this direction are being made in Egypt. Recently Saudi Arabia and Yemen have launched independent research programmes. But currently, with the exception of the traditional uses of mineral hot water springs for bathing, no geothermal application exists in the ECWA member States. Accordingly, there is room for further, intensive R & D in this area.

F. Biomass energy

25. In all ECWA member States biomass, in the form of wood, charcoal, crop residues and dried animal dung, is of considerable importance to the rural populations. In some of the least developed and poorest countries of the region, the use of biomass is at least as important in its magnitude as the use of conventional commercial energy sources. However, some studies indicate that in certain locations (e.g. in Yemen) it may be less efficient to use biomass than conventional fuels because of the application facility and freely available abundance of the latter.

26. It is expected that biomass will continue to be an important source of energy in the poorest and rural communities especially those located in remote areas in some countries. Furthermore, socio-economic changes may bring about different trends in utilizing biomass for energy purposes. The major factors that might lead to that is the declining agricultural productivity, food deficiencies, and increasing pressure on land usage across the region, resulting in rising costs for biomass as an energy source, in view of the inefficient usage practiced within the region. This negative impact of the socio-economic changes on the development of biomass energy has been augmented by the extraordinary escalation in prices associated with wood and charcoal, and inflationary pressure in the case of Yemen.

27. There is a low level of interest in the ECWA member States in the production and use of biomass for energy generation. Two important issues need to be discussed in this respect: (a) in view of the decreasing agricultural productivity and increasing prices of conventional fuel, some policy measures have to be developed in the light of the potentials and rural development priorities at the national level; (b) for maximum socio-economic benefit, various components of a biomass energy system including production, processing and end-use technologies etc., should be evaluated to determine the cost benefit alternatives in the light of an overall regional energy strategy.

G. Issues for discussion

28. In addition to the points raised above, there are other issues that ought to be considered when discussing energy and industrialization.

29. The progress attained by the region as a whole in developing its technological capacity for the development and application of energy resources has been slow. The significant point in respect to this is that there is a low regional capacity for manufacturing equipment for the application of energy resources, power generation and distribution. Such equipment includes

steam and wind turbines, solar pumps, biomass digesters, oil-drilling and production equipment including pipes, degassing units, gas-processing and petroleum refinery facilities including stabilizers, distillation and pressure vessels and ancillaries (heat exchangers, storage tanks) etc.

30. Initiatives to establish capital goods industries have been taken by some ECWA member States. But as far as energy application is concerned, the capital goods industry has been tailored toward general purpose equipment such as pipes heat exchangers, simple pumps, small transformers and switchgears, cables, circuit breakers, electrical appliances etc.

31. Thus an important issue that needs serious investigation and discussion is the development of the capital goods industry for the fabrication of equipment that supports the development of energy resources and the accorded application/utilization facility. An important criteria for the selection of candidate capital goods industries should be based on the following facts:

(a) Local demand for relevant equipment in any country may not be sufficient enough in the foreseeable future to merit the establishment of an economically-viable manufacturing facility. Thus, regional projects with forward and backward linkages ought to be considered in which a high local content can be attained through regional co-operation;

(b) Industries with high economies of scale and/or industries in which economic viability is generally obtained by producing a technologically-related product mix;

(c) These industries are usually technology-intensive, and require a broad technological base. Thus the relevant technological capacity ought to be established.

H. ECWA's role

32. During the past few years, ECWA has been involved in conducting research pertaining to energy demand/supply in the Arab World, including new and renewable energy resources. In addition, ECWA has undertaken a few feasibility studies related to specific regional projects for the fabrication of equipment to serve power plants, electricity distribution, oil refineries and gas-processing plants. Therefore ECWA may be in a position to assist further in selecting priorities and in formulating a plan of action for the implementation of projects. In the mean time, ECWA could assist the member States to initiate an R & D programme, training programme and development programme for the development of non-commercial energy resources such as biomass, solar energy etc.

V. STRENGTHENING ECONOMIC CO-OPERATION AMONG DEVELOPING COUNTRIES

A. The need for co-operation among developing countries(1)

1. The present international division of labour and structure of international economic and industrial relations has not been favourable to a balanced and dynamic industrial growth in developing countries. It is the recognition of this fact that has, inter alia, generated a new need for international co-operation based on the principle of national and collective self-reliance.

2. The imperative need for economic and industrial co-operation among developing countries has been stressed in various international forums. Thus, the Programme of Action on the Establishment of a New International Economic Order envisaged measures to be taken by developing countries to promote collective self-reliance among them and to strengthen mutually beneficial international economic co-operation with a view to bringing about accelerated development of developing countries (General Assembly resolution 3202(S-VI), Section I, 1(b)). The Lima Declaration and Plan of Action on Industrial Development and Co-operation adopted by the Second General Conference of UNIDO further underlined the fundamental importance of co-operation among developing countries for the acceleration of their industrial development and recommended various measures to that effect. Moreover, the programme of action adopted at the Fourth Ministerial Meeting of the group of 77, held at Arusha in 1979, the United Nations Conference on Technical Co-operation among Developing Countries, held at Buenos Aires in 1978, and the High-Level Conference on Economic Co-operation among Developing Countries, held at Caracas in 1981, have gone a long way towards providing a framework for international work in the field of economic and technical co-operation among developing countries. The Caracas Conference reaffirmed that economic co-operation among developing countries (ECDC) was not a substitute for global economic co-operation between developing and developed countries, nor did it exempt the latter from their responsibilities and commitments to the developing countries. At the same time, it stressed that ECDC offered an opportunity for taking full advantage of the actual and potential complementarities existing among the developing countries themselves. In this connection, the Caracas Conference underlined various priority fields of action in the areas of trade, technology, food and agriculture, energy, raw materials, finance, and industrialization, all of which have a direct or indirect bearing on industrial development in the developing countries.

3. Regarding the industrial sector itself, it should be noted that both the Lima Declaration and Plan of Action adopted by the Second General Conference of UNIDO, and the New Delhi Declaration and Plan of Action adopted by the Third General Conference

of UNIDO, stressed the strategic importance of economic co-operation among developing countries in virtually all dimensions of the industrialization process: trade, development and transfer of technology, development of human resources, exploitation of natural resources, energy development, mobilization of financial resources, strengthening of institutions and policies, negotiations with developed countries and transnational enterprises, etc. This points to the importance attached to Industrial co-operation among developing countries (ICDC) as a unique element of ECDC and the crucial role it is expected to play in national and collective self-reliance.

4. Industrial co-operation among developing countries is not to be considered as a substitute for North-South industrial co-operation. The two forms of co-operation are not to be considered antagonistic but complementary, and industrialized countries should support this co-operation. In fact, the industrialized countries have, in general, indicated their support for strengthening and enhancing the effectiveness of co-operation among developing countries. This support was expressed inter alia by the General Assembly in its resolution 3362 (S-VII), on development and international economic co-operation, and by the United Nations Conference on Technical Co-operation among Developing countries held at Buenos Aires in 1978.

5. Present world conditions reinforce the need for ICDC. First, it is being recognized increasingly at the political level that ICDC has become an imperative need if industrial growth and the economic and social benefits arising from it are not to stagnate or in some cases decline further. Second, the developing countries as one collective unit by now already possess considerable resources and technology for their industrial development. They have: (a) the raw materials, minerals, energy, fibres, coffee, tea, cocoa, sugar, cereals etc.; (b) technological and labour capabilities; (c) physical and institutional infrastructure; and (d) significant financial resources. Third, there is a significant measure of complementarity both in the resources and to some extent in the industrialization needs of the developing countries, given their various stages of industrialization, which with proper stimulus could lead to mutually beneficial ICDC. Fourth, vast markets for industrial products exist in the developing countries; these markets could be exploited through ICDC which would lead to increased industrial capacity utilization or development of new capacity. Finally, many developing countries share similar historical backgrounds and face similar economic and social problems. By and large they are ex-colonies and many have achieved political independence only recently. They are, moreover, predominantly primary commodity producers whose export earnings depend on a few products, which render their economies vulnerable to developments beyond their borders. In an attempt to solve their

problems, these countries have acquired a wealth of valuable experience in the industrialization process that could be shared among themselves.

6. While the potential for co-operation exists, there are constraints to an effective and sustained ICDC. There are certain prerequisites for promoting an expanded and more effective flow of technology, capital and industrial skills for industrialization in developing countries. The UNIDO Preparatory High-Level Expert Group Meeting on Industrial Co-operation among Developing Countries identified those prerequisites as:

(a) The formulation of policies and incentives conducive to industrial co-operation among developing countries that are integrated within overall national development plans and policies and are supported by considerations of equity and mutuality in the sharing of benefits;

(b) The establishment of appropriate mechanisms at the national, regional and international levels for the execution of such policies;

(c) The identification of promising areas or projects where co-operation would be particularly effective and would be of mutual benefit to all parties, as well as be within the capabilities of developing countries to implement.

7. The remaining two sections to this note summarise the experience and specifics of the economic and industrial co-operation in the ECWA region and areas and modalities of co-operation with developing countries.

B. Regional Economic and Industrial Co-operation(2)

8. Economic and industrial co-operation among ECWA's member countries has been conceived within the framework of the Arab League system and, more recently at the subregional level, within the framework of the Gulf Co-operation Council (GCC).

9. The overall economic co-operation of the last three decades has taken the following forms:

(a) Market integration and trade liberalization both at the multilateral and bilateral levels. This was, until recently, the dominant type of co-operation pursued.

(b) A more recent type of co-operation sought through the creation of transnational Arab companies to develop joint production facilities in the various sectors of the economy that include specific projects in industry, agriculture, construction, commerce and tourism;

(c) Co-operation in the field of financing especially after 1973. This includes the creation of developmental and commercial financial institutions, and flow of funds in the form of grants and development financing from oil to non-oil countries under bilateral and multilateral arrangements;

(d) Co-operation in the field of technical assistance and development of regional economic infrastructure and services facilities. Towards this end, various institutions and associations have been established that include producers associations and federations, as well as functional and technical services institutions. This includes in the field of industry, the Arab Industrial Development Organization (AIDO), the Gulf Organization for Industrial Consulting, Arab Standards and Metrological Organization and the various producers' associations including iron and steel, chemical fertilizer, textiles, cement, food processing, engineering industries.

10. Economic co-operation among member countries of the ECWA region was mainly conceived within the multilateral economic co-operation system developed under the League of Arab States and a number of unilateral and bilateral economic co-operation agreements that were concluded outside the Arab League system.

11. Multilateral economic co-operation drives have their origin in the charter of the League of Arab States which was created in March 1945, with the objective of strengthening and consolidating the economic, political and cultural ties of member States. Since then a number of basic economic co-operation agreements were concluded and regional institutions and machinery for promoting economic co-operation were created.

12. It was in 1950 that the first multilateral agreement, the Treaty of Joint Defence and Economic Co-operation, was concluded. This was followed in 1953 by the Arab Trade Convention and the Arab Payment Convention. The main Arab League institutions created to follow-up on this matter included the Arab Economic Council (AEC) which was established in 1953 and became in 1959 an autonomous body of the Arab League. It was the first institution for sponsoring negotiations, preparing programmes and making recommendations concerned with Arab economic and financial co-operation. The AEC reports to the Arab League Council on all its activities and decisions.

13. Another attempt at promoting multilateral agreements was taken in 1957 with the passing of the Arab Economic Unity Agreement and the subsequent creation in January 1964 of the Council of Arab Economic Unity (CAEU). The latter's objective goes beyond economic co-operation, having full economic integration and unity as its ultimate aim. To this end the CAEU would propose concrete measures aimed at unifying policies on trade,

customs duties, foreign exchange regulations, payment arrangements, taxation, development programmes, etc. The creation of the CAEU was conceived by its promoters as a turning point in the history of Arab economic integration. It was intended as a decision-making body; however, the Council's decisions are not binding on member States until ratified by national legislation authorities. In practice member States have not been strictly abiding by their commitment to CAEU decisions.

14. The CAEU established the Arab Common Market (ACM) and an array of intergovernmental specialized agencies, producers associations and Arab joint ventures.

15. In 1965 the Arab common Market (ACM) was established by CAEU. The founding States members included Egypt, Jordan, Iraq and the Syrian Arab Republic. ACM's long-run objective is the establishment of full economic integration, evolving from a free trade area to a custom union, a common market and finally achieving full economic integration.

16. Turning now to bilateral arrangements, a number of bilateral trade and payment agreements have governed the trade relations among ECWA States members. The main features of these trade agreements include preferential treatment which is limited to tariff reductions and exemptions affecting particular trade flows. These arrangements have included a list of commodities that has been changing with the change in production structure, particularly in industrial structure. The agreements are concluded for short periods subject to renewal. They are supplemented by bilateral payments agreements.

17. Trade liberalization, both at bilateral and multilateral levels, has been met with only limited success, mainly in the field of agricultural products and manufactured consumer products. A number of important factors contributed to this outcome. Trade restrictions were usually not lifted completely. Thus, while tariffs were reduced, import quotas and foreign exchange and financing restrictions were still in force. Trade and transit agreements were subjected to cumbersome administrative red tape, and there was an inadequate system for settling trade payments arising from trade imbalances. Additionally, differences in the economic and political systems and the levels of economic and industrial development, and the non-complementary nature of the economies were among the more important factors for the limited success of this experience. In fact, trade among ACM countries amounts to a small percentage of their total trade.

18. Joint ventures are fairly recent in the Arab World. It was not until the early 1970s that notable efforts by Governments, Arab Institutions, and private investors succeeded in the establishment of a number of joint ventures in the field of agricul-

ture, mining, manufacturing, energy, transport and communications, construction, insurance, and tourism, as a result of the tremendous increase in oil revenues accruing to the oil countries of the region.

19. One may distinguish three types of Arab joint ventures. The first are the Arab multinational companies usually organized as holding companies and created within the framework of the Arab League and its organizations. The second include companies that evolved through bilateral and multilateral agreements between two or more Governments. The third are joint ventures established by the private sector and private financial institutions. Certain joint ventures are a combination of the above.

20. The Arab multinational industrial joint companies that have been conceived within the framework of the Arab League system include the CAEU and OAPEC-sponsored joint ventures. CAEU established the Arab Mining Company, the Arab Pharmaceuticals and Medical Supplies Company and the Arab Industrial Investment Company. OAPEC established the Arab Petroleum Investment Company. These companies have been generating and promoting a number of industrial projects that are at various stages of implementation. OAPEC has also established the following companies that are operational: the Arab Maritime Company, Arab Petroleum Transport Company, and the Arab Shipbuilding and Repair Yard.

21. Other joint ventures have been set up on the basis of agreements between two or more Governments, in which one of the partners is usually an oil country participating in the equity of projects in a non-oil country.* Both countries benefit from such an agreement whereby oil countries utilize their surplus funds and waive the constraint of the capital scarcity of its partner, so as to exploit some natural endowments or production capabilities and substitute them for imports on the local market, on the oil country's market, and possibly on the regional market. Examples of such bilateral joint ventures include cement plants in the Gulf area, the Aden refinery, the copper mining project in Oman, a number of Kuwaiti-Yemeni joint ventures, the Libyan-Syrian Joint Investment Company, the Saudi-Egyptian Industrial Investment Company, the Saudi-Sudanese

*The Industrial and Technical Co-operation Agreement between Saudi Arabia and Kuwait, the Iraqi-Kuwaiti Committee for Implementation of Joint Projects, the Iraqi-Yemeni Co-operation Agreement, the Kuwaiti-North Yemeni Joint Ventures, the Kuwait-Morocco Investment and Development Company, the Libyan-Syrian Joint Investment Company, the Saudi-Sudanese Authority for the Exploitation of Red Sea Resources and the Abqaiq Cement Plant established by Saudi Arabia and Bahrain.

Authority for the Exploitation of Red Sea Resources and the Syrian-Jordanian Investment Company.

22. A number of joint ventures have mixed ownership. They include participation by government and non-government institutions. These may consist of Arab firms such as the Kuwait Foreign Trading and Contracting Investment Company and the Arab Investment Company both of which participate in the equity of the Arab Mining Company. The Islamic Development Bank has shares in the Fujairah Cement Plant and in the Jordanian Petroleum Refinery Company in which the Arab Investment Company also participates. Non-government sources also include private investors and foreign firms with a minor share of the capital. In the Arab Potash Company, 9 per cent of the shares belong to Jordanian private investors, and the rest is owned by the Jordanian Government (51 per cent), the Arab Mining Company (25 per cent) Libya and Kuwait (5 per cent each), and the Islamic Development Bank (5 per cent). The Kuwaiti Gulf International Company has shares in the Lake Nasser Fishing Company (Egypt). The West German firm Beton Investment has 5.1 per cent of the shares of Alba, along with Kaiser Aluminium of the United States of America (17 per cent), the Bahraini Government (57.9 per cent) and the Saudi Arabia Basic Industries Company (20 per cent).

23. Arab industrial joint ventures are sometimes undertaken solely with private capital. Examples include the Arab Ceramics Company (Egypt), the Granulated Boards Industries Company Ltd. (Sudan), Babel Seapaint Company (Saudi Arabia), the Khartoum Spinning and Weaving Company, the Kuwaiti-Sudanese Company for Animal Production and Animal Fodder (Sudan), the Matches Production and Marketing Company Ltd. (Sudan), the Sharjah Heavy Industries Company.

24. The main features of the industrial joint ventures are:

(a) A good number were originally national industrial projects turned into Arab ventures by the addition of Arab equity financing to their capital. These projects are basically import substitution projects catering mainly to the host country's market. Others are for development of resource-based industries for export mainly to outside the Arab region.

(b) Major joint industrial projects depended on imported inputs. Aluminium Bahrain (Alba) for example, imports alumina from Australia, the main raw material in the production of aluminium in its Bahrain plant. Similarly the Qatar Steel and Iron Plant company (QASCO) imports pellets from Brazil and Sweden.

(c) Some projects have an important impact on the industrial development of certain individual countries. In Jordan, the three major industrial joint ventures, the Arab Potash Com-

pany, the Jordanian Refining Company, and the Chemical Fertilizers Industry Company have an important share of the total industrial production and contribute significantly to the growth of this sector. Similarly joint projects undertaken by Arab Mining Company are also of major importance for the national development of the countries especially in the important field of mining.

(d) The regional impact of most of the projects is not expected to be significant. The period of experience has so far been short for the multinational joint ventures sponsored mainly by companies established under the auspices of CAEU and OAPEC, most of whose projects have been conceived with regional orientation.

25. The most recent institution to enter the field of regional co-operation is the subregional Gulf Co-operation Council (GCC), established 4 February 1981. The Council members include Saudi Arabia, Kuwait, the United Arab Emirates, Qatar, Bahrain, and Oman. The GCC has established a number of agreements in the fields of defence, foreign affairs, education and energy. Additionally the Economic Agreement of 8 June 1981 embodied the detailed framework, mechanisms and principles of co-ordination, harmonization and integration of economic activity in the region. A distinctive feature of this agreement is the adoption of the principle of gradualism, so that co-operation can proceed pragmatically and cumulatively, rather than abruptly. The agreement stipulates an important role for the private sector in implementation and maintenance of economic interrelationships.

26. In summary, the experience of the Arab countries in regional co-operation has been similar to that of other regions attempting economic co-operation (Asean and Andean); it has not measured up to the expectations of the organizers. However, in some areas certain progress has been realized.

27. To begin with, over the years an elaborate system and institutions for economic co-operation have been developed under the League of Arab States and more recently the Gulf Co-operation Council. While limited progress has so far been achieved under market integration and trade liberalization schemes, some progress and a beginning have been made in the more recent type of co-operation sought through the formation of joint Arab ventures. Co-operation in the field of financing, elaborated on in chapter one, has since the 1970s met with a measure of success so has co-operation in the field of technical co-operation and development of regional economic infrastructure and service facilities. The flow of manpower professionals, both technical and unskilled, from non-oil to oil-producing countries should be added as another example of success in regional co-operation.

28. It is too early to predict the future direction of the Gulf Co-operation Council. However, in view of the region's homogeneity and financial power, some have ventured to predict this to be the most promising effort in economic co-operation among developing countries.

C. Areas and modalities of co-operation with
developing countries

29. Though there has been some progress towards co-operation with other developing countries which is evident from the importation of skills as well as the formation of joint ventures and bilateral joint commissions, there remains a vast potential for harnessing each other's resources for mutual benefit. The energy and financial resources of countries in the ECWA region united with the agricultural, mineral, human and technological resources of other developing countries can be used in programmes for industrial co-operation, including industrial projects. The task remains to identify specific projects - manufacturing or infrastructure and to establish channels for their promotion and implementation.

30. It is to be expected that geographical proximity and political compatibility will govern the initial choice of co-operating partners, with priority given to regional and sub-regional co-operation within the Arab World. Second and subsequent priorities will be given to extraregional co-operation and will take into consideration proximity and political compatibility.

31. Before identifying specific areas or promising projects for co-operation, two issues need to be considered by member States. The first relates to the need for policies and measures to be adopted by member Governments at the national and the regional level for promoting industrial co-operation among developing countries. The second relates to identification of appropriate mechanisms for promotion and implementation of these policies.

32. Policies and measures conducive to co-operation may be adopted as part of industrialization policies and included in the development plans of member Governments. The execution of these would be carried out by the appropriate governmental authorities and implementational machinery.

33. The existing institutional infrastructure at the national and the regional level can be a vehicle for identification and promotion of regional co-operation projects. This includes the various development and financial institutions established by member States at the national and the regional level to provide financial and development assistance to developing countries. Appropriate organizations within the Arab League system can also

be called upon to offer the services needed for such co-operation. At the international level ECWA, UNIDO and UNDP should be called upon to increase their activities, especially in identification, preparation and promotion of viable industrial projects leading to South-South co-operation.

34. A programme for identification, preparation and promotion of industrial projects under ICDC should be established with financing from member States, concerned national and regional financial institutions, UNDP, UNIDO and ECWA.

35. In promoting co-operation among developing countries, the private sector should be given an appropriate role in private economic systems. The Arab private financial institutions and the Arab League Chamber of Industry could play a leading role in this respect.

36. Specific areas having potential for co-operation include:

(a) Establishment of integrated agricultural and agro-industries complexes with developing countries having land resources but lacking financial resources; the technologies if not possessed by host countries can be obtained from technologically-advanced developing countries;

(b) Energy-based industries such as aluminium, iron and steel, and copper refining can be established in ECWA countries and for this, in order to ensure supplies of raw materials and intermediate goods, the development of mines as well as beneficiation and intermediate industries can be financed by ECWA countries;

(c) As there is a vast potential market for capital goods and heavy engineering products for which regional projects are being formulated, the standardized components and intermediates, which by their very nature require economies of scale or high labour/skill inputs, can be supplied through expansion programmes of existing units in non-Arab developing countries or new units can be established. the capital goods industry includes more than 4 million products and not only does it present the potential for input/output complementarity but it also gives final product complementarity;

(d) Forward and backward linkages exist in petrochemical and fertilizer industries. In order to ensure the markets for products, forward linkage industries can be established in non-oil countries, while within the oil countries product specializations can be introduced giving an immense advantage in terms of economies of scale;

(e) "On the job training" undertaken in developed countries is highly expensive. It would be advantageous to negotiate

agreements with industrially-advanced developing countries to extend their facilities for the benefit of ECWA countries;

(f) Some industrially-advanced countries have an excellent network of research, design and development facilities which can be utilized on the basis of research contracts. Besides ensuring availability of technology to ECWA countries this approach would be much less expensive. On the other hand, this approach would provide extra resources to the contracting parties for further development of their facilities;

(g) Non-availability of technology for identified projects from established developed country manufacturers, who fear losing control of their market, is a common impediment to the industrialization process. To the extent appropriate, technology which is available from technologically-advanced developing countries can be used;

(h) Competitiveness leads to another form of co-operation. The manufacturers from developed countries form commodity or industry cartels. The least that can be done by the emerging export-based industries in the developing countries is to formulate and apply common marketing strategies in order to penetrate the markets monopolized by the cartels. In ECWA countries there is an immediate need for such steps to be taken for petrochemical and fertilizer industry products.

Notes

1) United Nations Industrial Development Organization (UNIDO), "Strengthening economic co-operation among developing countries". Background paper (ID/CONF.5/4) and issue paper (ID/CONF.5/5). 10 January 1984.

2) Economic Commission for Western Asia (ECWA), "Evolution of economic co-operation and integration in Western Asia". (E/ECWA/DPD/W.G./15/3). 12 November 1981.

VI. LEAST DEVELOPED COUNTRIES IN THE ECWA REGION

1. The least developed countries (LDCs) are the poorest and economically the weakest of the developing countries and they have the most difficult structural problems. Their main characteristics are:

- (a) Very low income per head;
- (b) High rate of population growth;
- (c) Very low agricultural productivity and weak agricultural support;
- (d) Extremely low level of exploitation of natural resources;
- (e) High proportion of the population in the subsistence sectors;
- (f) Very acute scarcity of skilled personnel at all levels;
- (g) Extremely weak institutional and physical infrastructure of all kinds;
- (h) Very limited development of all sectors of industry.

2. The various efforts by the United Nations to highlight the state of the LDCs resulted in the United Nations Conference on the Least Developed Countries, which was held in Paris in 1981. There the Substantial New Programme of Action for the 1980s for the Least Developed Countries (SNPA) was adopted (See ID/CONF.5/10 and ID/CONF.5/8).

3. The aim of the SNPA is to transform the economies of the LDCs so that they can achieve self-sustaining growth and provide their people with fully adequate, internationally accepted minimum standards of nutrition, health, transport, communications, housing, education and job opportunities. To try to ensure the attainment of these objectives, the Conference made specific proposals on growth rates, financing, monitoring of implementation and the roles of particular sectors.

4. It was felt that the LDCs should try to achieve a growth rate of 7.2 per cent per annum and it was hoped that the developed countries would allocate at least 0.7 per cent of their GNP to official development assistance (ODA); subsumed in this would be 0.15 per cent to be devoted to the LDCs.

5. The SNPA urged that the flow of resources to the LDCs would be in the form of grants which were united and available not only for the foreign cost of projects but also for local costs and even recurring financing.

6. As industry accounted for a low proportion of the GDP of LDCs, generally less than 9 per cent and in some cases less than 4 per cent, this sector was expected to grow by at least 9 per cent per annum.

7. The actual performance of the least developed countries has not matched the targets set by the United Nations. In fact, over the period 1970 to 1980 the share of the least developed countries in world manufacturing output has stagnated at around 0.2 per cent even though other developing countries managed to increase their share from 8 to nearly 11 per cent. Far from growing at the rate of 9 per cent per annum, the growth rate of manufacturing value added (MVA) in the least developed countries was 7.7 per cent in the 1960s but declined to 4.2 per cent in the 1970s. Moreover, most of the growth was confined to a few countries.

8. The adoption of the SNPA has intensified the efforts of UNIDO to assist the LDCs to accelerate their economic development. There has been a considerable expansion in the demand for technical assistance and other services to be provided by UNIDO in support of industrialization efforts made by the LDCs. The technical co-operation activities in which UNIDO has been involved in the LDCs have been mainly in the field of agro-industries, small-scale and rural industries, industrial planning, training and industrial consultancy and management.

9. Two main issues have been considered by UNIDO to be presented to UNIDO IV with respect to the least developed countries. These are:

(a) The role of industry in the economic development of the least developed countries;

(b) The ways in which this role can be more efficiently performed.

10. Some suggestions made by UNIDO at both national and international levels concern the industrialization of these countries.

11. The factors which constrain the rate of industrialization in the LDCs, as identified by UNIDO are:

(a) Lack of financial resources;

(b) Poor performance of the agricultural sector;

- (c) Inadequate infrastructure;
- (d) Shortage of skilled labour.

12. In addition to the above there is the factor of size. That, however, matters much less in the production of agricultural commodities, consumer goods and services than it does in the case of intermediates and capital goods, which bring about the structural transformation of an economy.

13. It has been argued that to achieve structural transformation a country needs to have a GDP of at least \$US 4 billion. Using this figure in spite of the inflation changes, only 5 of the 36 least developed countries have reached the required level. In addition, the concept of formation of regional economic unions linking developing countries with the least developed countries, as well as other approaches have had serious limitations.

14. All this does not mean that the prospects for structural transformation in the least developed countries are not within reach. Here the emphasis is to be made on indigenous resource-based industrialization using small-scale processes and building-up integrated agro-industrial production in tandem with new approaches to international industrial co-operation.

15. As pointed out by UNIDO the inability of the least developed countries to achieve structural transformation in the short-run, implies that they will continue to be heavily dependent upon the rest of the world for trade and aid for some time. Given this inevitably vulnerable situation, the least developed countries warrant preferential access to external markets for their manufactures and other exports, as well as special measures to promote an increased flow of resources to them.

16. With regard to increasing industrial efficiency, it has been pointed out that great attention will have to be paid to the energy sector, with particular emphasis on industries for developing alternate sources of energy, in order to provide the necessary energy resources for industrial development.

17. Also considerable emphasis must be placed on technological advances that can bring new approaches to industrialization and help the least developed countries overcome their size limitations. The strengthening of domestic scientific and technological capabilities is as important as the transfer of modern technology from more developed countries.

18. In addition to reflecting an awareness of the resources available and of the technological possibilities, projects have

to be formulated so as to attract finance and stand a more than reasonable chance of being viable.

19. The preparation of feasibility studies from the project idea to a bankable propositions and assistance in negotiating finance and providing management are therefore areas in which the international community should provide more assistance to the least developed countries.

20. In order to operate completed projects efficiently, qualified staff are required at the board of management level as well as in other levels. Strengthening of financial management of the operating projects should not be ignored.

21. The question of repair and maintenance and the availability of skilled staff are crucial.

22. UNIDO concludes that while structural transformation is desirable, it is a long way off for most least developed countries. The need at present is to ensure that primary activities in these countries are thoroughly studied and viable industries established based on these and on the human resources available, and that when the industries have been established, they are efficiently operated. Positive action at the national and international levels will be needed to achieve these aims.

A. LDCs - ECWA region

23. The region of the Economic Commission for Western Asia (ECWA) includes two countries which the General Assembly has identified as least developed countries namely Yemen and Democratic Yemen.

24. While the two Yemens share between them, as well as with least developed countries in other regions, many of the symptoms of extreme poverty and underdevelopment, they differ in their potential for development and the extent of external assistance needed. Each country has its own peculiar situation and a number of problems emanating from such factors as differences in area, size of population, resource endowment, extent of contact with the outside world, and the degree of government involvement in the economic life of the country. The two countries also exhibit considerable variations with respect to several of their common problem areas, such as the quality of public administration and adequacy of infrastructure. Such differences and similarities in the problems and issues faced by the two least developed countries in the ECWA region point to the need for designing and implementing common and specific country measures and programmes. In recent years, however, and specifically since the mid 1970s, development efforts in both Yemens have made significant progress.

1. Yemen

25. The economy of Yemen experienced a rapid and impressive growth and transformation during the past decade. GDP grew at an average annual rate of about 8 per cent. There was also a significant structural transformation of output, a large decline in the share of the agricultural sector in GDP, and increases in the share of services, and to a much lesser extent, that of industry (including construction). By 1980, therefore, economic activity in Yemen was clearly dominated by the services sector.

26. By 1980, there had been considerable expansion in manufacturing. Nevertheless the contribution of manufacturing activity to employment and GDP remained relatively small. Employment in the sector accounted for less than 5 per cent of the labour force. Manufacturing value added contributed about 5 per cent to GDP.

27. Value added in the manufacturing industry increased at an average annual rate of nearly 12 per cent from 1975/76 to 1980/81.

28. By far the most important force behind the strong performance of the economy during the 1970s, was the rapid rise in the inflow of remittances from workers employed in the capital surplus oil-exporting countries of the region, mainly Saudi Arabia. The transfers, however, declines substantially in 1981.

29. The fact that the economy of the country depends on fluctuating sources of revenue (workers remittances) highlights the need for a substantial increase in external assistance.

30. From approximately 1974 on, as a result of large labour migration, domestic wages began to increase sharply. The increase in nominal wages in the private sector may be of the order of 400 per cent since the mid-1970s. Average monthly manufacturing wage rates in 1980 were of the order of YRls 1650 (\$US 367). At this level, labour costs in Yemen are very high as compared with those of other developing countries. In contrast, the average monthly manufacturing wage rates in Democratic Yemen were of the order of YD 65 (\$US 188). Moreover Yemen's labour costs are very high in relation to its per capita GNP.

2. Democratic Yemen

31. The economy of Democratic Yemen has also experienced rapid and impressive growth. GDP has grown at an average annual rate of about 20.6 per cent during 1975-1980, which is considered quite high. The manufacturing industry witnessed an average

annual growth rate of 24.5 per cent which surpassed that of all other sectors.

32. There has been also a significant structural transformation of output. The share of the manufacturing industry in GDP increased from 10.2 per cent in 1975 to 11.9 per cent in 1980. In contrast, the share of the agricultural sector in GDP decreased for the same period.

33. However, despite this progress and in view of the low resource base, very low level of consumption, low productivity and growing imbalance in commodity trade, the Government is facing an enormous and challenging task which is virtually impossible to accomplish without substantial external assistance. In this respect, a considerable contribution to the balance of payments is made by the remittances of Yemenis who are employed abroad. Some foreign exchange earnings are also contributed by the Aden Oil Refinery and the Port of Aden.

B. Issues related to industrial development in Yemen and Democratic Yemen

34. The industrial development in Yemen and Democratic Yemen faces the following common principal constraints:

(a) Poor endowment of natural resources (except for non-metallic building materials) for supporting resource-based manufacturing;

(b) Acute shortage of skilled workers, technicians and industrial managers;

(c) The high cost of labour in Yemen imposes an additional severe constraint on industrial development;

(d) Lack of financial resources;

(e) Energy constraints, i.e., no known commercial energy resources, other than firewood, vegetable waste and animal dung;

(f) Small size of the domestic markets;

(g) Weak infrastructure and expensive user costs (e.g. in the case of electricity).

These constraints imply that the pace of industrial development cannot and should not be forced.

35. Therefore the basic thrust of industrial strategy in Yemen and Democratic Yemen over the next 5-10 years would concentrate on import substitution primarily in consumer goods and building

materials, provided the industries in question are competitive, or promise to become so within a reasonable time.

36. A suggested emphasis on import substitution does not imply neglect of, or discrimination against, export-oriented industries.

37. The future development of the agro-industry sub-sector is highly constrained by the lack or inadequacy of local raw materials. Yemen and Democratic Yemen depend heavily on imports to meet their need for foodstuffs. Thus a viable long-term development strategy for this branch of industrial activity must focus on agricultural research and programmes aimed at the production of the agricultural products for which each country has suitable ecological conditions.

38. Democratic Yemen possesses substantial fish resources, which in addition to contributing to the diet of the population, are a major source of export earnings. High priority should be given to the expansion of the fishing industry which should be oriented towards exportation. Towards that end there is a need to strengthen research and the training of personnel, to improve the operations of the fishing fleet and to modernize methods of storing, canning, freezing, and processing the catch.

39. The non-metallic building materials subsector is the principal domestic resource-based industry in Yemen and Democratic Yemen. Both have substantial deposits of stone, silica, gypsum, clay, kaolin, etc.

40. The principal component of the strategy for further development of the subsector should be to utilize efficiently the non-metallic resources. Geological surveys including mapping, aerial photography, drilling of cores, and sample analysis of the resources already known to exist should be completed. Such a methodical approach is necessary before planning and implementation of industrial projects.

41. Salt is considered one of Democratic Yemen's principal resources. Greater emphasis should be given to raising the production, which is presently operating below capacity owing to damaged equipment, and the lack of spare parts and export marketing facilities. Salt deposits also exist in Yemen. Joint industrial projects using salt as a basic raw material for an export-oriented industry should be seriously considered.

42. It appears that there is little potential for developing a textile industry, especially in Yemen, because of high labor costs and a shortage of trained manpower.

43. The development of light engineering industries through medium-sized plants with versatile production machinery seems to be a promising area of investment.
44. Consideration also needs to be given to establishing large-scale capacity plants, largely based on imported inputs namely wood and ply wood, to produce standard runs of doors, windows and furniture.
45. Both Yemen and Democratic Yemen being adjacent to each other give rise to a unique situation for formulating a certain concept of market linkage and promotion of joint industrial projects. Therefore, by pooling their markets, they can overcome the problems of small domestic markets constraining their industrialization and structural transformation.
46. There are several candidate project ideas to be promoted jointly by Yemen and Democratic Yemen in all sectors and in particular in the intermediate and capital goods sectors. Such options ought to be given high priority. Regional financial institutions are called upon to encourage extending grants and loans in this field.
47. In both Yemen and Democratic Yemen project identification, and choosing appropriate technology and equipment, as well as other pre-investment activities are important industrial development support structures. These ought to be strengthened, and in order to be effective, these functions have to be carried out vigorously and continuously. In line with this, project supervision and monitoring should be also carried out systematically.
48. With regard to training requirements, short-term courses may be a useful solution. In addition, training centres in the region should be fully utilized.
49. Effective utilization of expatriates, by assigning suitable counterparts and support facilities is essential.
50. Proper maintenance of the existing and new plants is an important issue. Adequate maintenance programmes and repair facilities are required to prevent the shortening of the useful life of these plants. This problem, which is not uncommon in the rest of the ECWA region, is serious in view of the scant attention it has so far received.
51. In order to increase the industrial efficiency in Yemen and Democratic Yemen, steps are to be taken to effectively reduce the illiteracy rate, particularly among the workers. Although this rate is not known among the workers presently but at the country level, it is as high as 90 per cent.

52. In view of the above, it may be concluded that for accelerated development of the economy of Yemen and Democratic Yemen during the 1980s, it is essential that not only the flow of official development assistance in real terms should increase, but also that the quality of assistance should improve. Such assistance should be in the form of grants and soft-term loans to finance urgent economic and social infrastructure projects which usually have long gestation periods. There should be untied commodity and programme assistance in importing a wide range of commodities for capacity utilization and development purposes as well as for generating counterpart funds for the financing of local costs and recurring costs. Technical assistance in the areas of resource surveys, feasibility studies, management training, identification and promotion of joint projects are required.