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**ECONOMIC AND SOCIAL INFORMATION SYSTEMS IN SUPPORT
OF SUSTAINABLE DEVELOPMENT AND REGIONAL INTEGRATION IN AFRICA**

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0.0.0 INTRODUCTION

1. The important role of information in all walks of everyday life has long been recognized. Various types of information compilation form the very basis of any research, analysis, inferences and policy planning. Consequently, much effort goes towards collection, processing, storage, analysis and dissemination of economic and social information. Due to the recent Information Technology (IT) revolution coupled with advances in the communication networks, the economic and social sectors in the national and international circles are facing challenges to increase considerably the efficiency and timeliness of data capture, processing and dissemination of a diverse collection of economic and social data archives, for the purposes of policy planning, monitoring and evaluation of national development plans and, recently, for development of strategies for regional economic integration.
2. Modern computing tools have allowed increased access to the information and its diffusion at different desired levels by an increased number of users. However, the same ease of usage of these tools, in many cases, has encouraged creation of numerous "ad-hoc" data systems with scant regard for "connectivity" between different data-sets. Recent improvements in capabilities and practices at national and international level to collect, organize, process, store, share and disseminate economic and social information through creation of "linkable" statistical data holdings along with their related descriptive information in the form of meta-data systems, leading towards integrated information systems, provides wide-ranging possibilities for national and international policy makers to acquire efficient access to the necessary level and detail of information for their respective planning and policy matters.
3. Timely and appropriate information not only forms the basis for national development plans but in view of the new world order, where regional economic and trade groupings and regionalised development issues acquire added importance, economic and social information systems at national and sub-regional/regional level are expected to play a crucial role towards feasibility and continuous monitoring of performance of such regional groupings. Indeed, timely information provides a vital edge to any planner/negotiator in today's very competitive markets.
4. In the African region, this fundamental role of economic and social information systems has time and again been accepted at the various fora, and most recently through the Addis Ababa Plan of Action for Statistical

Development in Africa in the 1990s ^{1/} its importance is reiterated as one of the objectives of the Plan in the following words:

"to achieve national self-sufficiency in statistical production including creation of a comprehensive national statistical data base by the end of the century".

5. The paper presents brief conceptual framework necessary for creation of viable economic and social information systems with a view to utilization of modern Information Technology (IT), particularly communications networks regarding ease of "connectivity" of such information systems. The role of economic and social information is emphasized in the light of sustainable development and economic integration issues.

1.0.0 ECONOMIC AND SOCIAL INFORMATION SYSTEMS: CONCEPTUAL ISSUES

6. As outlined in the introductory paragraphs, economic and social information provides wide-ranging scope, spectrum of applications and significant impact on our daily lives. This does not imply however that every bit of information remotely related to the economic and social issues must be included in the information system. Certain selections have to be made and priorities formulated, for the inclusion of the type of information according to the objectives and targets of the proposed information system, and relation and structuring of the desired data should be geared towards attaining these goals. In the following paragraphs certain concepts, necessary for elaboration of framework relating to the economic and social information system, such as data-sets, databases, scope, contents and data structures as well as meta-data systems etc. concerning national, regional/international data needs are briefly reviewed. However, the paper does not provide detailed technical description of this conceptual framework which may be found elsewhere in United Nations documents or other technical papers related to the information system topics.

^{1/} The Plan was adopted by the Twenty-fifth session of the Commission and Sixteenth meeting of African Ministers responsible for economic planning and development, May 1990.

1.1.0 Economic and Social Information Systems (ESIS)

7. While individual data items at micro level form the lowest element of any information system, "structured" data-sets may be termed as the foundation "building-blocks" towards creation of an organised database, provided a number of systems approach considerations are adhered to, consequently leading to establishment of a fully-fledged information system. An information system is usually composed of a number of data-sets/databases with capability of interlinking with each other or at least connected to the nucleus module. These data-sets may be considered as different nodes of a network of data-systems. Therefore, a database system may in itself comprise a complete information system, particularly if it possesses a multi-sectoral data capability and is accompanied by detailed descriptive meta information necessary for explaining different aspects of the system and its data. Generally, a database maybe described briefly as a collection of data-sets conforming to simillar data classification and coding structures organized in a unitary database architecture and under a singular database administration. An information system, however, maybe a collection of one or more data-sets and/or databases, which may follow different data structures, classifictions and database architectures, but each data-set being able to pass some or all of its information to other data-sets of the system.
8. It is generally accepted that economic and social sectors deal with massive arrays of statistical data processed and shared among large number of users with diverse capabilities and backgrounds. Economic and social information systems are therefore primarily composed of statistical and related data holdings, structured data series, econometric models or point-survey data etc. accompanied by detailed descriptions (meta-information) necessary to explain fully the quantitative information. However, the two types of information (quantitative as well as qualitative and descriptive) must bear strong relationship to each other such that comprehensive data dissemination is facilitated through linking of the two types of information. Together, the above types of information (quantitative as well as qualitative) supplemented by the referral data systems providing, for example, trader profiles, company registers and other directory information including maps and graphics and names and addresses of related services etc. make up the basis for a sound economic and social information system.

1.1.1 Objectives of ESIS

9. Main objective of the perceived economic and social information system at the national level should be to:

- (i) strengthen its respective information capacity through proper utilization of the modern Information Technology (IT) at the same time not discarding the existing systems altogether, but to create linkages between these systems; and
- (ii) improving the provision of information services to the concerned national planners, researchers and the public at large as well as the outside users including regional institutions and the international organizations.

10. ESIS should ideally be capable of close linkages among statistical and related data holdings contained in the system and eventually a closer integration, through connectivity of all its modules, should be the overall objective.

11. A good information system provides: not only efficient data compilation procedures, such as...

- data capture;
- processing;
- storage/retrieval;
- analysis; and
- dissemination and distribution,

but also good data-exchange mechanism between its nodes and modules are well as across other related information systems. This element of ease of access and "connectivity" puts a given system above the rest, specially when data from different data banks is needed to be merged and manipulated before its final dissemination (typically, horizontal collaborative efforts will always be dependent upon such data-linkage capability).

1.1.2 Scope and contents of ESIS

12. Rapidly changing data relating to international commodity prices and markets, stock exchange situations, international weather and air/sea traffic conditions etc. are being commercially maintained and disseminated

through the various communications networks. Maintenance of statistical data series, government accounts and large scale directories and references in most cases still remain the responsibility of national planning and statistical authorities or the concerned line ministries. Therefore priority to include data in the national economic and social information system will remain maintenance of traditional statistical systems like:

- System of National Accounts;
- International Trade;
- Population and Social Indicators;
- Agriculture and Environment;
- Health and Education;
- Transport and Communications;
- Immigration and Tourism; and
- International and Government Finance etc.

13. Increasing amounts of meta-information about the system and the data are also necessary to be maintained in order to provide complete and meaningful dissemination of the selected data-sets. Additionally, referral information relating to directories and profiles and the related bibliographic material also must form an integral part of the desired system. These directories may include:

- Country profile, including, for example, information on climate, ecological maps and graphics, natural and man-made calamities etc.;
- National trade directory;
- Directory of industry and manufacturers;
- Directory on freight and packaging;
- Trade Control Measures (at least by partner);
- All the related documentation, including order forms, tax returns, proforma invoices, manuals and catalogues etc.

14. As mentioned earlier in the paper, information related to the economic and social sector, readily available and previously being maintained should be included in the system on priority footing. Information which can be collected easily and needed on regular basis in maintenance and dissemination of the system should form part of the information system.

1.1.3 Development Considerations for ESIS

15. In order to provide the national users with the appropriate and complete economic and social data

picture, it is firstly important to develop necessary information "building-blocks" and infrastructure at the grass-root level i.e. to establish conduits and channels of primary data-flow, such that the information aggregates can then be supplied to the higher levels of the national network hierarchy. This approach calls for development of national database capability and a two-fold problem may be encountered:

- (i) the national custodians of data are often not able to maintain regular supply of data to the higher nodes of the network. The problem can only be resolved through establishment of a proper vertical data aggregation system.
 - (ii) the horizontal data-linkages often remain unexplored and consequently various sectoral data across the chain are not fully utilized due to the lack of necessary connectivity and non-existence of proper economic and social "information system".
16. The planned system should take full advantage of modern technological developments such as integrated networks (Local as well as Wide-Area Networks) and user-friendly database systems. While the overall objective of the proposed information system should be the provision of integrated and harmonized solutions, due to the extensive expense and resource requirements usually associated with a "fully" integrated system, it may be advisable to develop the system in a "modular" manner through "open" architecture.
17. The information does not need to be maintained entirely in one location. In case of Company Register, for example, the company details may be maintained by Department of Industry, while details relating to production, costs, employees, taxation, import/export etc. may be maintained independently by the various concerned governmental units. Under this approach, however, each module of the overall information system must be clear about its respective responsibility relating to the maintenance and up-dating of the system. The practice of maintaining and distributing "master-files" by the responsible unit ensures that all the concerned users of the information system use the same information at a given time.
18. Systems approach (as apposed to ad-hoc development) must be adopted such that data from different modules of the

system can easily be aggregated at any desired level without extensive "interface" development.

19. As development of completely new systems need extensive resources, connectivity platforms, to utilize the wealth of information already maintained by a wide variety of data producers, should be developed to create a "linkable" network of economic and social information system.

1.2.0 New technology and ESIS

20. Through the advent of the micro-computers, more and more "isolated" data-sets have mushroomed and the linkability aspect of these data-sets have been over-looked. Consequently, it has given rise to a tendency to replace vertical hierarchial data systems based on mainframe (host) computers by horizontally connected distributed systems. Connected distributed environment provides scope for development of economic and social information systems across wide spectrum of applications and users and better utilization of resources. Also emergence of "open" architecture systems based on international standards offer greater opportunities for modular system developments and integration through linkability.

1.2.1 Direct Access

21. General Assembly's resolution 1991/70 on "on-line access to United Nations' databases" urges that suitable infrastructure be created to make direct access to all UN databases feasible for the member States. The above resolution provides clear future direction regarding direct-access through international communications networks.
22. Despite rapid progress achieved in information technology circles, it was observed in recent international fora ^{2/} that direct access to "structured" statistical databases at least, required skilled "packaging/unpackaging" and at present sufficient user-

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- 2/ - Ninth meeting of the Technical Working Group on Statistical Data Bases of the ACC Sub-Committee on Statistical Activities, April 1992, Geneva.
- First meeting of the Data Processing Sub-Committee of the Coordinating Committee on African Statistical Development (CASD), June 1993, Stockholm.

orientation did not exist to adequately and efficiently utilize these data systems through direct access. More user-friendly dissemination products need to be developed before these "structured" data systems can be placed on directaccess market. Where as directaccess is recognized as a long-term objective, it is believed that selected information from such databases could more efficiently be retrieved through other electronic media.

23. Direct-access to the referral databases and directory information, however, appears to pose little problems for the "communications-conversant" users. Further extension of the necessary network infrastructure to facilitate such on-line access to browse or retrieve information from referral data bases is highly desirable.

1.2.2 Networks and Electronic Data Inter-change (EDI)

24. Information Systems networks may be visualised as a chain of information connected appropriately through electronic communications or otherwise such that the detailed information at the lowest level is assembled and cleaned, and aggregations at various levels are maintained with minimum amount of duplicative effort. An ideal information system network once established can provide easy access and link to any part or level of the desired information contained in the network with a minimum amount of necessary interfacing.
25. Ease of communications through appropriate communications protocols, for experienced users, provides unlimited opportunities to tap onto whole host of information systems maintained by various commercial and other international agencies. Readily available information includes news bulletins, sport, weather conditions, financial and commodity markets etc. Over the coming years electronic networks are expected to play major role in all aspects of social and economic data compilation procedures, through adoption of electronic data interchange (EDI) techniques. EDI techniques can lead to an efficient exchange of "structured" data ready for further processing.
26. EDI systems are playing an increasingly important role in the information systems of various economic operators in the course of their commercial and administrative activities (e.g. production, distribution, invoicing, declarations etc.). Due to the advent of the new technology, paper products are expected to diminish. Consequently, data capture through traditional

questionnaires will not be entertained by the commerce and industry. In a recent paper 3/ on the subject it is proposed that two main areas which can clearly benefit from EDI techniques are:

- the mechanism of collection and dissemination of statistical information; and
- the inter-linking of statistical systems.

27. EUROSTAT, OECD, UN/ECE and some of the national statistical offices in the European region are now actively involved in EDI projects relating to data-capture and dissemination of statistical information.
28. Priority for future is to bring meta-data into the electronic world by creation of necessary referral databases and directories. EDIFACT (Electronic Data Interchange for Administration Commerce and Transport) is already playing an important role in this area. This in turn will reduce rigidity of data dissemination through association of all the related meta-information.

1.2.3 Dissemination products

29. Timely dissemination of economic and social information, after completion of necessary data manipulations, to the targeted market through the most appropriate media must be considered as one of the major objectives of the information system. Until recently, statistical dissemination has been restricted mostly to the paper products composed of bulky tabulations, and data distribution via magnetic media. However, through utilization of new technology more efficient dissemination products and modes have recently been adopted in the economic and social sectors. Some of these products are considered in the following paragraphs:

(a) Automated telephone response system

30. This method of data dissemination has been successfully adopted inter-alia by the US Bureau of Economic Analysis, where the system is made available to the potential

3/ EUROSTAT; Overview of EDI standardisation in statistics; Conference of European Statisticians; 23rd session of the Working Party on Electric Data Processing; February 1993, Geneva.

callers 24 hours a day, 7 days a week. Up-to-date information about certain selected economic indicators is maintained on tape cartridges. The information is changed at different frequency depending upon the period of update in the main system. Numerous advantages, including: its 24 hour availability; saving of professional time answering routine data queries etc., along with some technological disadvantages of the system are cited 4/.

(b) Bulletin Board Systems

31. The bulletins composed of certain selected data files are prepared periodically and maintained on the host computer. The system can be accessed by most micro-computers equipped with the relevant modem and communications software. The system does not need special developmental effort rather timely dissemination is achieved through making the selected data files available to the subscribers. However, the system provides little data selectivity and offers no interactive capability. Often users encounter problems in getting into the system which is aimed at skilled clients.

(c) CD-ROM

32. This method is particularly useful for dissemination of large data matrices. Often the data is accompanied by user-friendly menus as well as adequate amount of meta-information. The product when accompanied by suitable software provides wide ranging data-selection and querying options. Over the coming years this product is expected to make a significant impact on the dissemination market. However, at present, it is still relatively expensive for creation of few copies and potential users with CD-ROM drives are very few in number as compared with the overall proliferation of the microcomputers. Dissemination through CD-ROM has numerous advantages, some of which are: compactness; durability; ease of use; access speed; integrity and large volume of data contents.

4/ Carson, Carol S.; Electronic Dissemination Experiences of the U.S. Bureau of Economic Analysis; International Association for Research in Income and Wealth; 22nd General Conference; Flims, Switzerland, September 1992.

1.2.4 Data distribution

33. This is an intermediate step before dissemination and often involves distribution of micro-level data with appropriate recoding in hybrid form to provide confidentiality. Selected data from complex hierarchical structures is distributed in the form of "flat-files", accompanied by all the necessary meta-information for further processing. Data distribution is usually aimed at experienced users and is achieved through computer printouts, electronic/magnetic media or direct including remote access to the data bases.

2.0.0 ESIS: INTERNATIONAL/REGIONAL EFFORTS

34. Numerous databases in the economic and social sectors are currently being maintained and further developed by various international and regional agencies, in order to accomplish their respective mandates through inter-country/inter-regional comparisons. Many of these systems are disseminated through electronic media including diskettes and CD-ROM etc. and are also accessible via international communication media provided proper infrastructure has been established. Inventories of these data systems are regularly up-dated by the responsible UN agencies. It is beyond the scope of this paper to make objective comparison of all these systems, however few of the directly related efforts are listed below:

2.1.0 United Nations Economic and Social Information System (UNESIS)

35. United Nations secretariat and its regional commissions maintain massive arrays of data related to the economic and social sectors, including data on:
- . population and social indicators;
 - . multi-sectoral statistical series;
 - . policy analysis and policy making; and
 - . other related indicators.
36. Recently, the Department for Economic and Social Information and Policy Analysis (DESIPA) at the UN headquarters, has undertaken to harmonize and standardize the data holdings maintained at DESIPA and the regional commissions in order to establish a secretariat-wide "United Nations Economic and Social Information System" (UNESIS), initially through creation of connectivity between all the existing related data modules. (ECA's

multi-sectoral statistical database ECA-RSDB and other related databases will eventually form an integral part of UNESIS).

37. Implications of the above developments are far-reaching and not merely restricted to the UN secretariat, and in the long run, the member States themselves will be the real beneficiaries through wider access to efficient and harmonized economic and social information system.

2.2.0 Trade Analysis and Information System (TRAINS)

38. The TRAINS system, as the name suggests, deals mainly with the trade sub-sector of the economic and social sectors. Recently, the work has been completed to provide compatability across five different databases by utilizing Harmonized Commodity Description and Coding System (HS). TRAINS integrates the following databases into a single system:

- Trade Control Measures (TCM) system;
- Generalized System of Preferences (GSP) system;
- The system of the International Customs Tariffs Bureau (ICTB);
- Trade data on import values by the supplying country, furnished by UNSTAT and others;
- The IMPORTERS database of the International Trade Centre (ITC); and
- General documentation on market research studies etc.

2.3.0 STATNET (UN/ECE)

39. This is a network adopted by the Economic Commission for Europe (ECE) to provide direct access, initially to the statistical authorities of the member States, to its statistical data holdings resident on its mainframe computers. The access will be gradually widened to the other interested governmental departments of the member States as well as other international agencies.

2.4.0 PADIS: Information System and Network

40. PADIS comprises both an information system and a network.

2.4.1 The Information System

41. PADIS' information system is comprised of five in-house databases that drive from information produced in or originating from Africa. These include:

PADdev: Bibliographic database of literature on social, economic, scientific, and technological aspects of development in Africa. It contains 20,000 bibliographic references and abstracts to development literature from UNECA documents as well as as those contributed by African national and institutional participating centres in the PADIS network;

PADexp: Referral database of 3,000 African experts in social, economic, scientific, and technological development fields. (Entries include information on the education, professional experience, and publications of each expert listed in the database);

PADinst: Referral database of 200 subregional and regional development institutions in Africa, including a subset of the 43 UNECA-sponsored institutions;

PADpro: Referral database of 2,000 research and development projects in Africa, concentrating on those carried out by African research institutions;

PADdab: Database of databases, produced and maintained by subregional and regional development institutions in Africa.

2.4.2 The network

42. The PADIS network consists of 38 national participating centres, which receive advisory services, training and PADIS data bases and input data into the system for exchange with other countries in the region, subregional and regional institutional participating centres. Four subregional centres have been or are in the process of being established. Institutional participating centres include 43 institutions specialized in particular development fields.
43. To improve information access and promote information exchange in the Africa region PADIS is presently executing a three-year project entitled "Capacity Building for Electronic Communication in Africa (CABECA)", which is working to promote computer-assisted networking throughout Africa. CABECA's overall objective

is to provide technical assistance to bring about sustainable computer-based networking in Africa, at an affordable cost, accessible to a wide variety of users from both the private and public sectors. To build African capacity for computer networking, it will train a corps of systems operators who can train others in their area and offer continuing support to fledging users to ensure the sustainability of national nodes with connections to international networks. CABECA's goal is to strengthen the existing systems and initiate others in order to put computer networking on a firm footing by the end of three years. At the end of three years it expects to have 24 national nodes functioning on a sustainable basis.

2.5.0 UN/EDIFACT

44. Working Party on Facilitation of International Trade Procedures (based at UN/ECE) has over the past 12 years been working in developing standards concerning data elements, codes, system rules etc. for electronic data interchange (EDI). UN Electronic Data Interchange for Administration Commerce and Transport (UN/EDIFACT) is the result of this development and is the world standard for EDI.
45. All the ECE member States, various inter-governmental and non-governmental organizations and a number of UN agencies are members of the above working party. Currently five UN/EDIFACT regional boards are functioning in all regions of the world (except Africa).

2.6.0 UNECA 1993 survey of economic and social data processing capability in Africa

46. During the second half of 1993, the Commission conducted the above survey to produce its Directory of EDP Centres and Experts. As a prelude to establishing inventory of databases in economic and social sectors, questionnaire relating to the statistical databases was included in the survey. By the end of January 1994, 47 returns from eleven countries had been received. The information relating to the economic and social databases is scanty. Future survey to establish the inventory of ESIS capability will be an important first step in harmonized development of ESIS in the region.

3.0.0 ESIS IN SUPPORT OF SUSTAINABLE DEVELOPMENT AND REGIONAL INTEGRATION

47. In today's inter-dependent economies, no nation however powerful can remain totally self-reliant, and developing countries particularly, are relatively more dependent, regarding their development plans, on the world economic situation. Consequently, changes in the international economic and social conditions bear immediate and important world-wide impact.
48. Daily news relating to various economic and social sectors, particularly commodity prices, financial and stock market situation, regional conflicts, industrial relations, trade wars, weather and natural disasters etc. are events which steer the direction of international socio-economic infrastructure. Thanks to satellite and information technology networks, excellent media coverage and systems have been developed and are commercially available to cater for the above "news" items.

3.1.0 Sustainable development and ESIS

49. The road to attaining sustainable development is through, firstly mapping out viable and realistic national socio-economic development plans. National planners are therefore in dire need of all the relevant economic and social data, inter-alia including: historical series; latest census and survey results; data from financial institutions; detailed national accounts; information from line ministries and from the private sector; expectations and projections relating to, for instance growth rates, tourism etc, to be input in the treasury model of national economy to generate a sustainable course for the nation's development.
50. Sustainability is susceptible to the margin of error, due to the incomplete data and unknown factors beyond the control of the national planners. The model is almost daily subjected to international economic indicators, financial and commodity prices typically oil prices, other periodic indicators provide additional input to the national economic and social information system and the treasury model. Thus, the model is continuously being monitored in the light of the changes and performances. The daily indicators serve as important "fine-tuning" mechanism and neither the ESIS nor the model can remain isolated from this mechanism. Information which can enforce deviation of the development process either side

of the equilibrium by a considerable margin due to the circumstances beyond the planner's control are termed as "external shocks". Models which do not cater for all eventualities as an integral part of the information system, often render inconclusive forecasts and are prone to severe uncertainties and continuous revisions. All the developing economies are particularly vulnerable to these "external shocks".

51. Thus, it is essential that the national economic and social information systems:
 - (i) furnish a complete (both vertical and horizontal) background picture of the economic and social sectors;
 - (ii) provide adequate international socio-economic indicators, particularly where loans/grants are concerned; and
 - (iii) is directly linked to the country's treasury model, such that the changes in ESIS are immediately reflected in the model and simulations relating to various eventualities are well planned.
52. In order that timely and correct development planning data is readily available at the fingertips of the country planners, it is important that the national ESIS is continuously monitored through the prevailing situations and up-dated accordingly and all the models are linked to the same ESIS for the sake of harmonization. A well established and comprehensive ESIS goes a long way towards timely detection of shock-waves in the national economic models and corrective measures can then be undertaken, once the causes have been correctly diagnosed.
53. Like the other developing countries, in the African region the development plans often have to be endorsed by the donors and loan consortiums. This gives an added incentive to create a unified ESIS composed of all socio-economic sectors including systems relating to various loans, aid-flows and investments, specially if numerous projects, rather than programme approach, are in operation. The more projects/programmes are in operation, the more harmonization it will require for a consolidated monitoring of the development situation in the country. Therefore, it will be preferable to feed all the necessary monitoring data in the central ESIS which can then provide an overall picture, not only of

these development projects but also their respective contribution to the rest of the economy. Here total socio-cultural impact of all projects can also be gauged.

54. Individual donors and investors usually provide their own tailor-made monitoring procedures, however this should not deter the country planners from linking these and additional indicators to the central ESIS. It is important that consolidated economic rate of returns as well as overall impact of all the projects and programmes is measured through the ESIS indicators. A centralised ESIS is a convenient vehicle which not only caters for on-going monitoring of development (including projects etc.), but can also provide additional project analysis and evaluation in the light of other related indicators which may not had been collected under the project.

3.2.0 Regional integration and ESIS

55. As mentioned earlier, no nation can sustain its development over a period, in isolation from the rest of the world, and international trade for centuries has played a major role not only in determining the shape of various economies but the very map of the nations. Roots of colonizations, wars etc. can be traced to the same phenomena i.e. international trade. Over the recent years, terms like: NIC (Newly Industrialised Country); MFN (Most Favoured Nation); GATT (General Agreement on Tariffs and Trade); UNCTAD (United Nations Conference on Trade and Development) and many other international, governmental and non-governmental organizations owe their birth to international trade.
56. It is clear that international trade plays a crucial role in developing of the world and this inter-dependency is so inter-twined that recession in one major importer/exporter country can transmit the shock-waves throughout the globe. Most of the developing countries (except some who are blessed with natural resources like oil) suffer heavy trade deficits against the industrialised nations, and this imbalance keeps on increasing due to the unfavourable terms of trade (against the developing countries) and the trade control measures applied by the powerful trading blocks. Various rounds of North-South dialogue (on transfer of technology) as well as Uruguay round of GATT negotiations have failed to secure equitable terms of trade. In certain situations, unpayable loans have been written off by the international creditors with the imposition of ERP

(economic reform programmes) before more loans for imports and development can be granted.

57. One classic model often portrayed, by the politicians and economists of the underprivileged nations, as a way out from this vicious circle is creation of regional economic blocks, to be endowed with sufficient factors of production and eventually attaining enough bargaining muscle to enforce concessions from the other trading partners to achieve trade balance equilibrium through improvement in terms of trade.
58. Unfortunately, due to a variety of factors, apart from European Economic Community (EEC) - members of which had well-established trade patterns even before the formalization of the Community treaties - , Association of South-East Asian Nations (ASEAN) to some extent has been successful in sustaining the integration hopes. To a varying degree, Economic Cooperation Organization (ECO, composed of Central and South-Central Asian countries) during the 1980s also generated some positive intra-group trade, but due mainly to the sanctions imposed on one of its members.
59. Numerous other regional groupings, including in the African region have mushroomed over the years. These include:
- . PTA (Preferential Trade area for Eastern and Southern African States);
 - . ECOWAS (Economic Community for West African States);
 - . SADCC (Southern African Development Coordination Conference);
 - . Maghreb Union; and
 - . Manu River Union etc.

With all the good intentions, majority of these groupings have been primarily based upon sub-regional political considerations and less on round economic analysis. It is also clear that under the prevailing trade patterns, where primary trade routes had been directed towards the previous colonial powers for the purpose of obtaining cheap raw materials from the colonies, infrastructure to facilitate intra-regional trade between the potential members of the block is non-existent or little developed. Under the circumstances, classic theory of economic integration alone does not justify regional integration among the developing countries specially when due to lack of relevant and up-to-date data aggregations on intra-

group trade, it is very difficult to estimate trade creation/trade diversion and trade complementarity potentials.

60. A comprehensive regional economic and social information system, under the circumstances finds its due importance in order to inter-alia cater for the necessary data for:

- (i) Country profiles, necessary for negotiations and establishment of starting points;
- (ii) feasibility studies relating to the integration possibilities;
- (iii) necessary economic analysis, estimation and simulation (with realistic forecasts and quashing of false expectation);
- (iv) identification of integration path;
- (v) prioritization of sectors and strategies of integration in order to achieve maximum and early benefits of the union;
- (vi) chalking-out of medium/long term integration and development plans for the region;
- (vii) Continuous monitoring of these plans and achievements.

3.2.1 Regional economic and social information system and networks

61. To serve the data needs of the grouping regarding inter-country/inter-region comparisons it is essential that a regional ESIS linked to the national ESIS is established. After creation of the grouping, pace of integration has to be organized according to the indicators emerging from the group's ESIS, taking into account the progress achieved, the competition faced from the rest of the world including trade control measures applied by other blocks, before bilateral/multilateral agreements by the members of the grouping can be undertaken.
62. Apart from serving group's own planning and monitoring needs the regional ESIS can be useful in providing harmonized data series to the international UN and specialized agencies which operate under their own geographical groups. Region's own ESIS can ease the burden of development planning and monitoring of projects

undertaken by one or more donor who do not conform to the same geographical grouping. Some of the examples are:

- . UNDP Bureau of the Arab States, and rest of Africa;
- . WHO Bureau of Central Asian region (with new geographical coverage);
- . World Bank Data presentation according to its own geographical groupings;
- . United Nations its various departments have their groupings according to the regional commission memberships;
- . OECD adopts its own geographical grouping;
- . LAS League of Arab States straddles across different regions as well as regional commissions;
- . ECO Economic Cooperation Organization, members belong to different regional commissions.

63. Due to the non-availability of current "group-specific" data, and in order to facilitate regionalized development plans, it is important to create group's own economic and social information system linked to the member country ESIS as well as to the other relevant international databases.
64. The establishment of an African Economic Community and the development of regional economic groupings need to be further supported by computer networks for electronic information interchange. Use of networks is essential for industrialists, investors and economic operators in order to get timely and accurate information for the design of a product or to gain access to a fruitful foreign market. Networking enables better circulation of information between partners in the private and public sector in the same continent and between continents. Networking will also facilitate subregional and regional economic groupings to improve productivity, profitability and reduce costs. Networking is a mechanism for regional economic co-operation and integration in Africa. Electronic data interchange can be achieved in Africa if communities of interest and convenience form a link to share the same information.

4.0.0 CONCLUSIONS AND RECOMMENDATIONS

65. Overall objective of the perceived economic and social information system at the national level should be:
- (i) to strengthen their respective information capacity through proper utilization of modern Information Technology (IT), at the same time not discarding the existing systems altogether, but to create proper linkages between these systems; and
 - (ii) improving the dissemination of the relevant information to the target users (concerned planners, public at large as well as outside users including regional institutions and international agencies).
66. In order to establish a comprehensive and inter-connected information system it is important, as a first step, to take an inventory of all the related databases, data-sets etc. maintained by the organization/country. ECA has already taken initiative and introduced an inventory questionnaire in its 1993 biennial survey of economic and social data processing capability in the region. In future region-wide inventory of these information systems should be established at the commission.
67. Due to difficulties in compiling "group-specific" data it is important to develop region's own economic and social information system (ESIS) linked to all the national ESISs as well as other related international databases. In this respect UN secretariat efforts to establish a secretariat-wide UNESIS and strengthening of ESIS at the regional commissions gives added weight for establishing of regionalized ESIS for Africa at UNECA.
68. A regional board to deal with the electronic data interchange (EDI) issues related to economic and social sectors in line with the other UN/EDIFACT regional boards should be established in the African region. While UNECA should provide the secretariat for this regional board, other inter-governmental, non-governmental organizations like OAU, ADB, and sub-regional groupings should be encouraged to its membership.
69. Whereas, it is accepted that the bulk of the economic and social information systems is composed of structured statistical data holdings, directory and referral databases relating to country profiles, company and

industry directories and other related bibliographic details as well as detailed meta-information form an integral part of ESIS.

70. Historical data series are a basic ingredient for forward planning and consequently complete and extended backward series are essential for better economic modelling, estimation and forecasting.
71. The proposed economic and social information system should establish not only vertical linkages but also extended horizontal connectivity across various related sectors.
72. The proposed system should utilize the state-of-the-art IT tools particularly in establishing communication networks (LAN/WAN), and adopting the "open" system architecture along a "modular" development path.
73. While direct access should be the overall objective, until communications are further improved and necessary user-orientation in packaging/unpackaging of structured data is achieved, other means like diskettes and CD-ROM for data exchange should be utilized. However, direct access to referral and directory databases should be encouraged.
74. Dissemination of economic and social information should be widened and improved through utilization of newer dissemination products.

5.0.0 **BIBLIOGRAPHY**

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