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**REPORT OF THE
NINTH UNITED NATIONS REGIONAL
CARTOGRAPHIC CONFERENCE FOR AFRICA**

Addis Ababa, Ethiopia
11-15 November 1996

A. ATTENDANCE AND ORGANIZATION OF WORK

1 The ninth United Nations Regional Cartography Conference for Africa was held at the new Conference Centre at the headquarters of United Nations Economic Commission for Africa in Addis Ababa, Ethiopia, from 11 to 15 November 1996. At its official opening, the meeting observed a minute of silence in honour/tribute to the two late colleagues Messrs Olyinka Adekoya, former Surveyor General of Nigeria and Chief Funso Olujohungbe, the former head of the Cartography and Remote Sensing Unit at ECA, who passed away in 1995 and 1993 respectively. The meeting was formally opened by H E Mr Makonnen Manyazewal, Vice-Minister of Planning and economic Development of the Federal Democratic Republic of Ethiopia. Statements were delivered at the opening ceremony by Mr L L Mollel, Chairman of the eighth United Nations Regional Cartographic Conference and Mr P A Traore, OIC, Natural Resources Division.

2 Representatives of the following African countries attended the conference: Algeria, Botswana, Chad, Côte d'Ivoire, Egypt, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Lesotho, Libya, Madagascar, Malawi, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Rwanda, Seychelles, South Africa, United Republic of Tanzania, Tunisia, Uganda, Zambia, and Zimbabwe.

3 The meeting was attended by United Nations Member States: Canada, France, Germany, the Netherlands, Poland, Sweden, United Kingdom, United States of America.

4 Observers from the following subregional and regional institutions were represented: Organization of African Unity (OAU), African Organization for Cartography and Remote Sensing (AOCRS), Regional Centre for Services in Surveying, Mapping and Remote Sensing (RCSSMRS), Regional Centre for Training in Aerospace Surveys (RECTAS), Centre Régionale de Télédétection Ouagadougou (CRTO), Centre Régionale de Télédétection pour les Etats de l'Afrique du Nord (CRTEAN) and African Association of Remote Sensing for the Environment (AARSE).

5 Also present were observers from national and international organizations from Economic and Social Commission for Western Asia (ESCWA), Food and Agriculture Organization (FAO), United Nations Educational, Scientific and Cultural Organization (UNESCO), Office for Outer Space Affairs, Vienna (OOSA), United Nations Fund for Population Activities (UNFPA), Conseil National de l'Information Géographique (CNIG, France), ITC - The Netherlands, Industrial and Commercial Projects (Lerca), International Development Research Centre (IDRC), International Hydrographic Organization (IHO), University of Lagos (Nigeria), University of Glasgow (United Kingdom), Institute of Geography (Bern University, Switzerland), International Cartographic Association (ACI), GDTA (France), International Society for Photogrammetry and Remote Sensing (ISPRS), AMTECH Services (Ethiopia) and MEMONAS P L C (Eritrea).

6 The conference elected the following officers:

Chairman	Nigeria
First Vice-Chairman	Botswana
Second Vice-Chairman	Morocco
Rapporteur	Madagascar

Exhibition

7 After the opening session, the participants visited a technical exhibition on the themes of the conference. The following were the Exhibitors: Algeria, Botswana, ECA, Ethiopia, IFUS, LEICA, Madagascar and Memonas PLC.

Credentials

8 Credentials were examined and found in order

Technical Committees

9 The conference elected a technical committee for the preparation of resolutions. The committee consisted of the following members: *Algeria, Côte d'Ivoire, Guinea, Morocco, Namibia, Nigeria, South Africa, Zimbabwe and AARSE*

B. AGENDA

10 On 11 November 1996 the Conference adopted the following agenda

- 1 Opening of the conference
- 2 Election of officers
- 3 Adoption of the agenda and organization of work
 - (a) Report on credentials,
 - (b) Establishment of technical committees
- 4 Report on progress made since last Conference
- 5 Data acquisition and standardization
 - (a) Observation sensors
 - (b) Toponymy and geographical names
 - (c) Digital data
- 6 Data Manipulation and Utilization
 - (a) Mapping from space
 - (b) Hydrography and nautical charting
 - (c) Land tenure and cadastre
 - (d) Orthophoto and similar products
 - (e) Digital photogrammetry
 - (f) Geographic and spatial databases
- 7 Regional Mapping issues
 - (a) Review of African programmes and activities
 - (b) Capacity building
 - (c) Inter-country cooperation
- 8 Policy and management issues
 - (a) Gender and cartography
 - (b) The role of the private sector
 - (c) New directions

9. Any other business
- 10 Adoption of the report
- 11 Closing of the conference

C. ACCOUNT OF PROCEEDINGS

Opening addresses

11 The Conference was opened by H E Ato Mekonnen Manyazewal, Vice-Minister of Economic Development and Cooperation of the Federal Democratic Republic of Ethiopia

12 His Excellency, Ato Mekonnen Manyazewal in his opening address expressed, on behalf of the Federal Democratic Republic of Ethiopia, a warm welcome to all the conference participants. He noted that the Ninth United Nations Cartographic conference would deliberate on critical issues in bridging the widening gap between demand and supply aspects of geoinformation and the need for transition from conventional to digital technology.

13 He added that participants are among those that have the responsibility of preparing the ground work for a timely action so that Africa could be the beneficiary of the opportunity brought about by the rapid advance of information technology. He concluded his address with an elaboration of the changes that were taking place at the Ethiopian Mapping Authority in order to meet the needs of the country. He wished the meeting a successful deliberation.

14 Mr L L Mollel, the Chairman of the Eighth United Nations Regional Cartographic Conference who welcomed H E Ato Mekonnen Manyazewal, Vice-Minister of Economic Development and Cooperation of the Federal Republic of Ethiopia, commended the esteem which member States are providing to this conference.

15 In his opening statement, Mr P A Traoré, OIC, Natural Resources Division, extended, on behalf of the Executive Secretary of the Economic Commission for Africa (ECA), a warm welcome to all conference participants.

16 Mr Traoré expressed appreciation for the good representation from the ECA member countries, the subregional and international organizations, and national institutions from Europe and the Americas. He noted that this was a clear indication of the common interest and concern that the participants shared in contributing to the socio-economic development of Africa. He also said that the world was in the midst of a revolution in information technology that is changing the way individuals and institutions relate to maps, to their meaning and their significance for our future.

17 The management of natural resources and the environment, he added, depended on accurate information about the location and distribution of resources, land use, and many other earth-related phenomena. Geo-information being a basic ingredient in development planning, its availability, deficiency or absence will determine the success or failure of any such venture. Without mapping support, geologic exploration, land management, cadastre, infrastructure design and implementation, etc are almost impossible.

18 The phenomenal development of science and technology during the past four decades has not spared the noble disciplines of geo-information. Mapping operations have been extended from ground to satellite, photographic imagery is yielding to digital imagery and manual cartography to computer aided cartography.

19 The ECA Secretariat, he said, was operating within its mandate and mission to facilitate the economic development of Africa, has always been deeply concerned with the above issues. The ECA was therefore, eagerly looking forward for the results that are

likely to come out from the discussion of documents submitted by member States and observers from Africa and outside the continent

Report on progress made since last Conference (agenda item 4)

20 Under this agenda item delegates from the following member States presented country reports regarding developments in cartography, remote sensing and geographic information systems in their respective countries: Algeria, Botswana, Côte d'Ivoire, Egypt, Eritrea, Ethiopia, Guinea, Lesotho, Libya, Malawi, Madagascar, Mozambique, Mauritius, Morocco, Namibia, Nigeria, Rwanda, Seychelles, South Africa, Tanzania, Tunis, Uganda, Zambia and Zimbabwe

21 The country reports revealed a number of common features which are summarized in the subsequent paragraphs

(a) Institutional development

22 Several delegates reported that as a result of development activities in their countries, the demand for geo-information had increased tremendously. Therefore, their institutions were undertaking important organizational and technological restructuring in order to improve their efficiencies and meet the changing needs of their countries. In this connection departments were being streamlined and modern equipments were being acquired in order to cope with the new developments while the older ones were being modernized

(b) Mapping activities

23 Many of the delegates informed the meeting about the Status and importance of topographic mapping coverage and the current major mapping activities that were being conducted in their respective countries. The revisions and the updating of existing maps were described as a major challenge in terms of the available equipments. Furthermore, some delegates reported on the production of orthophoto maps by conventional methods and also by using SPOT Satellite images. It was noted that the use of Global Positioning Systems (GPS) increased and that these were being used for the densification and extension of their national geodetic networks and ground control points for the production of topographic and thematic maps. Several delegates highlighted the conversion of their mapping systems from conventional to digital methods which was mainly due to demand by users and which could also be attributed to the developments in the computer technology

(c) Remote sensing and geographic information systems (GIS)

24 Several delegates reported about their remote sensing technology applications for the different planning areas. Satellite remote sensing, it was noted, brought new opportunities for several application areas such as land use inventory, *change detection monitoring including growth of urban areas, food security*, forest and rangelands management resource management, etc. The traditional methods of collecting and analyzing data on natural resources are becoming inadequate. Therefore, national capabilities were being developed in the use of these new technologies. Besides the availability of satellite images, the acquisition of aerial photographs for topographic and thematic mapping still played an important part. With regard to GIS several participants informed the meeting that their departments acquired the GIS hardware and software systems and have started to use them for integrated resource information and management

(d) Training

25 Training and human resources development were priority activities in many countries. Training took place either abroad or in the countries depending on the availability of local training facilities. Some member countries informed the meeting that they were providing education and training in mapping, surveying and related fields in their higher institutions of learning. In addition to their nationals they also trained students from other African countries. In-service training, it was noted, constitute an important component of the national institutions activities.

(e) Problems

26 The following were cited as the major impediments in the development of cartographic services in member States

(a) Insufficiency and unreliability of financial resources for the acquisition and operation of equipment,

(b) Poor maintenance of equipment,

(c) Lack of adequate training facilities, and

(d) Rapid change of technology which, at times necessitates total replacement of hardware and software

27 During the discussions questions were posed and appropriate answers were provided regarding the use of orthophoto, the status of cartography in Eritrea, the methods for reconstructing geodetic reference points, training facilities within and outside Africa, the restructuring of state enterprises in member States and its effect on the technical staffing of mapping institutions, and the consequences of the rapid changes of technology

28 Also the following United Nations member countries and subregional and regional organizations reported on their activities since the Eighth United Nations Cartographic Conference: United Kingdom, United States of America and France, African Association of Remote Sensing for the Environment (AARSE), Centre Régionale de Télédétection Ouagadougou (CRTO), Regional Centre for Services in Surveying, Mapping and Remote Sensing (RCSSMRS), Regional Centre for Training in Aerospace Surveys (RECTAS) and International Cartographic Association (ICA). The countries informed the meeting that their activities were influenced by the rapid technological developments in computer technology, space technology and satellite global positioning systems which encouraged them to undertake some institutional restructuring.

29 The reports by regional institutions mainly dealt with their activities in training, user services, maintenance of equipments, and advisory services provided to member States. Some of the regional institutions informed the meeting of the difficulties they are facing due to lack of contributions from member countries.

30 The ECA report concentrated on the activities carried out with regard to implementation of the resolutions of the Eighth United Nations Cartographic Conference by carrying out studies, and providing advisory services to regional institutions. The issue of the harmonization of ECA-sponsored institutions was also brought up within this context.

31 During the discussions information was provided on nature of the ECA study on the harmonization of ECA-sponsored institutions and the status of its implementation. Also discussed was the difficulties faced

by the owners of the portable ground receiving station that was temporarily installed in RCSSMRS in Nairobi

Data acquisition and standardization (agenda item 5)

32 The item was considered under two sub-themes viz Observation Sensors and Toponomy

(a) Observation sensors

33 Two papers were presented on this sub-topic. The first was on the Commercial Earth Observations Satellites (doc ECA/NRD/CART 9/ORG 11). The paper gave the background leading to the developments in the commercially owned digital earth observing satellite systems soon to be launched by seven companies towards the end of 1996 onwards. It also outlined the operational capabilities of the different systems as well as the technical characteristics, benefits and the relevance of these spatial information systems in support of the development of regional and national infrastructure and processes and products in the photogrammetric, remote sensing and geographic information system.

34 The second paper was on Airborne Laser Scanning: A New Remote Sensing Method for Terrain Mapping (ECA/NRD/CART 9/ORG 20). The paper outlined the technical parameters and the special features of the system suitable for topographical applications in terrain mapping of inaccessible areas, and for environmental monitoring.

35 During the discussions, information was provided on the commercial possibilities which provided the driving force behind the development of commercial satellite systems. Such systems would have large data storage and the price of their products would be comparable to aircraft imagery. As to ownership of data, company strategies differed, some could sell data or make it available on lease. It was stressed that increasingly a wide range of previously classified images were available for the benefit of the public.

(b) Toponomy

36 Three papers were presented on this sub-topic. The first paper was on the Collection and Standardization of Geographical Names (ECA/NRD/CART 9/ETH 4). The paper outlined the activities undertaken by the Ethiopian Mapping Authority (EMA) in the systematic collection of place names, mainly from the field, and their handling and management in both card catalogue and PC-based systems. It stressed the importance of standardization of geographical names and appealed to those concerned for exchange of information with other countries engaged in similar activities. The second paper (ECA/NRD/CART 9/ETH 6) titled the New Technological Advances in Cartography at the Ethiopian Mapping Authority (EMA) dealt with the recent technological developments in cartography in general and the modernization efforts undertaken by EMA in particular. The third paper (ECA/NRD/CART 9/ORG 8) was on the National Council for Geographic Information (CNIG). It outlined the functions and operation of CNIG *including* the National Commission for Toponomy. With regard to the toponomic problems in Africa, the paper highlighted the results and recommendations of a seminar by the French National Commission for Toponomy held in June 1996. These centred on the measures intended to create or strengthen national toponomic committees and their multifarious databases which are important to the various users.

37 During the discussions elaboration was provided on the collection and transliteration of geographic names in Ethiopia, as well as taking note of the difficulties in the collection and standardization of place names in Botswana and the need for assistance in this area.

Data manipulation and utilization (agenda item 6)

38 This agenda item was considered under the following six sub-topics mapping from space, hydrography and nautical charting, orthophoto and similar products, geographic and spatial datasets, land tenure and cadastre, and digital photogrammetry

39 The papers presented dealt with data manipulation (transformation, presentation, storage, etc) to satisfy the applications required by the different sectors of development in support of the planning of programmes and projects, and their implementation at the national and local levels. They included large-, medium- and small-scale topographic mapping, thematic mapping, hydrographic and nautical charting, aeronautical charts, cadastre mapping, atlases and gazetteers

(a) Mapping from space

40 The document (ECA/NRD/CART 9/ORG 13) on Topographic Mapping from Satellite Imagery in Africa reviewed the situation regarding topographic mapping in Africa. While for some African countries, their main concern was the production of new base maps, for many others their problem was the revision of a large number of existing maps which were actually out-of-date. The situation prevailing in most national mapping agencies was then outlined and the availability of satellite photography and scanner imagery over Africa discussed. Finally the paper summarised and discussed the accuracy results of the topographic maps derived from satellite imagery conducted over a number of test sites having different landscape characteristics

41 The second paper titled Remote Sensing based Forestry Mapping in Ethiopia and Sudan (ECA/NRD/CART 9/ORG 21) discussed the importance of mapping for socio-economic development and the budgetary and organizational constraints faced by mapping institutions in Africa. It highlighted the mapping of forests for inventory purposes as one of the urgent needs in the continent, because African forests were not only important for the ecology of a region but for the global climatic stability. The dramatic reduction of the forest within the last century mainly caused by the growing population, affected not only the ecology but also the economy of many countries

42 The third paper (ECA/NRD/CART 9/ORG 18) on Satellite Image Maps and Topographic Maps of Scales 1 50 000 and 1 25 000 Elaborated Digitally dealt with the experience made with the Russian high resolution space photographs taken by different space cameras and the SPOT satellite. Digital data were used for map updating for urban mapping. It also elaborated on the satellite image maps in the scales 1 50,000 and 1 25,000 and topographic maps of scale 1 50,000

43 The forth paper titled an Assessment of Human Impact on the Physical Environment Using RS and GIS Techniques (ECA/NRD/CART 9/ETH 3) dealt with the rapidly growing human population, extension of arable land and similar human and natural factors which are the main factors causing desertification, deforestation and degradation of soil and for ecological and environmental changes. Further, the paper noted that the Sahara Desert was extending southward due to the general trends mentioned above. To overcome these and similar problems, integration of remotely sensed data, especially that from satellites, with geographic information systems (GIS) could play an important role

44 The fifth paper (ECA/NRD/CART.9/Eth 2) titled Remote and Proximal Sensing of Eutrophic State Estimation of Lakes indicated that essential chemical elements which are transported via streams into lake basin cause eutrophication or productivity of lakes. The paper identified three main objectives: first to popularize the technical approaches for evaluating the degree of lake's productivity by remote sensing using high resolution satellite imagery and close range sensing using non-imaging spectrometer. Second to assess

the impact of excess algal growth on birds, fish and park animals. Third to propose remedial measures to mitigate natural and human stresses on lakes and environ ecosystem

45 During the discussions regarding mapping requirements, accuracy and limitations of various systems (stereo and topographic), and the availability of products on the open market. With regard to SPOT imagery, questions were raised on its accuracy when it dealt with vegetation mapping, and this deficiencies gave rise to the "grey areas". It was argued that maps of 1:50 000 were of disputable benefits to cover arid and semi-arid land in Africa. In Ethiopia, for instance, the use of remote sensing and GIS techniques in the assessment of human impact on the physical environment had assisted the local government in *planning for the solutions* to the problems it was facing.

(b) Hydrography and nautical charting

46 Two papers were presented on this sub-topic. The first paper (ECA/NRD/CART 9/ORG 7) dealt with the Development of Hydrography, Nautical Cartography and Bathymetric Mapping in African Waters. It highlighted the results of a survey by questionnaire carried out by International Hydrographic Bureau (IHB) to examine the extent to which improvements were necessary in the fields of hydrographic surveying and nautical charting. The findings of the survey recommended to create or strengthen the hydrographic surveying and nautical charting capabilities of the countries in the participating countries. Various training possibilities and options were also explained. It was further pointed out that the new version of the safety of Life at Sea (SOLAS) convention, once entered into force, may require that states with navigable waters adequately survey and chart these waters.

47 The second paper (ECA/NRD/CART 9/USA 4) was on the Development of a Computer-assisted Revision System for Nautical Chart. It dealt with the automation of production process of charts, whereby cartographers evaluate source document information and apply data directly to digital versions of the charts, eliminating the cumbersome manual compilation processes.

(c) Orthophoto and similar products

48 Two papers were presented under this subtitle. The first paper (ECA/NRD/CART 9/USA 8) on Building a Production System to support the National Orthophoto Programme. An Integration Challenge indicated that owing to the sudden change in demand for digital orthophotos, the U.S. Geological Survey was asked to accelerate the development of its production system. However the task was complex due to integration of issues responding to multi-agency requirements and because different contractors were producing the data.

49 The second paper (ECA/NRD/CART 9/ORG 9) dealt with interpreted digital space maps which was a new step in the mapping technology transfer which is suitable to areas inaccessible for land or aerial missions, and was less expensive than cartographic updating with standard techniques. The production of such spacemaps is now fully transferable to any National Mapping Agency. In this technology transfer, the training of the whole production team is therefore essential.

50 During the discussions, concerns were expressed by the participants regarding the quality of orthophoto images, resolution, costs and the technical difficulty in scanning diapositive photographs. As regards SPOT imagery, it was explained that methods and software programmes were developed to solve the problem of reconciling multitemporal datasets.

(d) Geographic and spatial dataset

51 Five papers were presented on this sub-topic. The first paper (ECA/NRD/CART 9/ORG 27) on Cadastral and Topographic Databases Developed in South Africa was presented in two parts. The first part

outlined the development and implementation of a computer based Cadastral Information System (CIS) in South Africa which would replace the old cadastral system that was paper archived and based on graphic representation of each plot of land and the title describing the rights of each plot. The ultimate goal of CIS is to improve the management of the available land information and to make the vast amount of information better accessible to a large number of users in the country. The second part dealt with the advances made in the creation of a digital topographic information so that users could have timely access to spatial information. Its main components were a national topographic information database, digital elevation models, and digital orthophoto images. It was indicated that in South Africa much effort had been made to overcome the problems experienced in other developing countries where the lack of spatial information hindered development.

52 The second paper (ECA/NRD/CART 9/Org 28) on Cartographic Data Manipulation and Utilization indicated that the effective utilization of all natural resources on the earth depended primarily on the knowledge about their existence and the availability of such knowledge to mankind in a format which makes their exploitation possible. In order to document the various resource parameters in a cartographic format a large number of parameter-specific map products had been developed and were regularly published by many nations of the world, and these products served as the basis for socio-economic development. In South Africa, as in the case in most industrialized countries of the world, these different map products covered a broad spectrum of parameters and were published in a variety of formats on a fairly regular basis.

53 The third paper (ECA/NRD/CART 9/ORG 29) on Information Networks for Earth Observation Data dealt with the current activities in Remote Sensing Data Information Networks. It outlined the developments, over last 24 years, which occurred in an increasing number of earth observation satellites in orbit, enhanced capacities of their sensor payloads and of RS data processing and analysis systems, and the creation of unprecedented global capabilities for environmental monitoring and natural resources surveys. However, the achievements of these systems from space platforms would not be judged by the number of earth observing satellites launched, or by volume of RS data recorded. The ultimate criterion of its success would be the extent to which RS data had contributed to the quality and sustainability of life on our planet. An essential requirement for effective application of remote sensing and other relevant geospatial data is the availability of user-friendly EO information networks, enhancing data accessibility at country as well as world-wide levels.

54 The fourth paper (ECA/NRD/CART 9/USA 5) on the Vector Product Format, an Overview provided an outline of the Vector format product (VPF), which was developed by the US Defense Mapping Agency (DMA), and discussed the purposes behind the standardization, its relationship to other spatial data standards, and products and applications which implement the standard. The DMA would be producing large quantities of data in VPF and would be made available widely.

55 The fifth paper (ECA/NRD/CART 9/MALAWI 2) on Phased Approach to the Development of a Land Information System outlined the efforts being taken by the Ministry of Lands and Valuation of Malawi towards developing a Land Information System which would not only act as the basis for all future land related projects, but will also provide the basic data for the review of the National Land Policy currently being undertaken by Government. Major problems in the implementation of the approach was also highlighted during the presentation.

56 During the discussions, it was recognized that remotely sensed data are now an essential tool for users involved in the natural resources management and environmental monitoring. At the same time the importance of staff training to acquire the required skills in the use of modern technologies was stressed, while the issue concerning the high cost of the equipment in relation to their reliability, and accuracy was discussed.

(e) Land tenure and cadastre

57 One paper was presented on this sub-topic titled Securing Traditional Land Rights in Mozambique (ECA/NRD/CART 9/MOZ 1) The paper stressed that land occupied by the rural population in Mozambique was legally recognized and the rights protected without formal title or registration Instead of systematic titling to protect these rights, they would be protected within the procedure to concessional land use rights to applicants i e when the occupancy rights were in fact threatened

58 During the discussions, concerns were voiced that in the absence of systematic titling and cadastral delimitation and registration, in the long run the system might lead to abuses (owners' attempts to extend their plots) and competing claims Therefore, formal registration would be a solution to that potential problem It was also felt that the procedure adopted to register land was time consuming and records deteriorate quite rapidly in a traditional environment that lacks understanding of the concept of title and land registration

(f) Digital photogrammetry

59 Two papers were presented on this sub-topic The first paper (ECA/NRD/ CART 9/ORG 14) on Development in Digital Photogrammetry set out the current situation in the development of digital photogrammetric systems (DPS) as applied to topographic mapping and GIS/LIS It discussed the various sources of digital image data and their volumes which have to be handled It also reviewed the photogrammetric quality scanners currently available on the market The second paper (ECA/NRD/CART 9/ETH.5) was on the Interpretability of Scanned Aerial Photographs It dealt with a research work which examined the accuracy in the interpretability of scanned aerial photographs by varying the pixel size and photo scale in both stereo and mono observations

60 During the discussions views were raised as to the cost effectiveness of the different remote sensing tools, and the comparison of costs relative to the accuracy attained

Regional mapping issues (agenda item 7)

61 This item was examined under three sub-theme, viz Review of African programmes and activities, Capacity building and, inter-African country cooperation

(a) Review of African programmes and activities

62 Five papers were presented on this sub-topic The first was on Remote Sensing a tool for sustainable development (ECA/NRD/CART 9/ORG 31) It covered an assessment of remote sensing activities in 13 African countries, and underlined indicators that show whether remote sensing technology was being adapted and utilized properly in the resource and environmental fields for which the technology was developed

63 The second and third papers (ECA/NRD/CART 9/ORG 30 & ADD 1) were on the FAO Africover Project The presentations gave the background of the project and its current status, and the possibility of establishing a unified geodetic datum for Africa

64 The third paper dealt with the new European Reference System EUREF - Status Report 1995 It covered the background and history of EUREF up to 1990 and reviewed past campaigns of the organization for the period 1991 to 1995

65 The fourth paper (ECA/NRD/CART 9/7) dealt with the results of the second campaign undertaken by the Secretariat to assess the status of topographic mapping coverage and programmes in Africa

66 During the discussions which followed, the question of the agency which will participate in Africover at country level was raised. Such agency could be the National Mapping Authority. Possibilities and modalities of the release by the United States of some information material were also raised. Participants were informed that this issue was under examination in the U S and that FAO and the Government of USA were working on an agreement with respect to that question, some clarifications on the utilization of Height system were given.

(b) Capacity building

67 Five papers were presented on this sub-topic. The first paper was on Technology Transfer through Institutional Cooperation (ECA/NRD/CART 9/BOTSW 2). The paper examined the technical assistance or donor funded transfer of technology in a mapping environment where the objective was to improve production capacity. It also gave a brief assessment of a well financed institutional cooperation, based on the case of cooperation between Botswana and Swedsurvey.

68 The second paper dealt with Staff development in mapping and similar institutions (ECA/NRD/CART 9/ORG 31). The paper described the challenges faced by National Surveying and Mapping Agencies and presented the response by the Geo-informatics Department of ITC to meet these challenges effectively.

69 The third paper was on experience in education and training and transfer of technology-Ethiopia, Uganda and India (ECA/NRD/CART 9/ORG 17). It presented an assessment of the remote sensing training programmes of the Ethiopian Mapping Authority and Modern Cartographic Centre of the Survey of India.

70 The fourth paper was based on Cooperation in mapping-related education in Africa (ECA/NRD/CART 9/ORG 32). The paper attempted to define the principal needs of mapping and related education and suggested various scenarios for self-help development of that education in Africa.

71 The fifth paper was on constraints and opportunities in human resources development in Africa in the field of earth resources and environmental information (ECA/NRD/CART 9/ORG 33). The paper reviewed constraints including marketing strategies, weak patronage of the Regional Centres, high cost of digital systems and products, lack of appreciation of the importance of long term investment in the relevant scientific and technological education as well as opportunities for human resources development in the field of earth resources and environmental information.

72 During the discussions, participants were anxious about the training in the new structure of ITC that would produce generalist instead of specialists. Participants were informed that ITC would now focus on training of the new types of specialists, that is, geo-informatic specialists. Concerns were also expressed that ITC training programme did not benefit French speaking countries. A representative from ITC explained that in line with its restructuring, ITC intended to decentralize part of its core programme so that French speaking countries might benefit from it. Regarding on-the-job training at the University, the meeting was informed that this was possible through consultancy, especially with relevant foreign agencies. The concept of critical mass in geo-informatics was considered as the best method for producing skilled man power for development.

(c) Intercountry cooperation

73 Two papers were presented under this sub-topic. The first one was on scope, objectives and functioning of PAIGH towards regional and intercountry cooperation (ECA/NRD/CART 9/ORG 34). The paper reviewed the basic organization of the Institute, one of the six specialized agencies of the Organization of American States, which among its numerous bodies has a Commission on Cartography and highlighted some of the projects carried out by the Commission of Cartography.

74 The second paper dealt with Thematic Mapping for Development and Management of shared Waters (ECA/NRD/CART 9/ORG 1). The paper gave an evaluation of existing data and information through the process of data processing, digitizing of relevant features from maps and plotting of maps as working sheets. It also covered 15 thematic maps to be used for the purpose of water resources planning and the provision of regional information to national institutions of ESCWA member States.

75 In the discussions which followed, a question about the possibilities of extending membership of PAIGH to Africa was raised. Participants were informed that there was no provision in the charter of Pan-American Institute which will allow this, however, possibilities of sharing experience with African countries could be explored, especially through AOCRS.

Policy and management issues (agenda item 8)

(a) Gender and cartography

76 A paper titled Gender and Cartography (ECA/NRD/CART 9/ORG 34) was presented on this topic. The paper dealt with the low level of women participation in cartography, a concern which was highlighted by the International Cartographic Association (ACI) as far back as 1989. That concern led to the establishment of ACI Task Force on Women in Cartography which subsequently became the ACI Working Group on Gender and Cartography. The paper explored the role of the United Nations in promoting gender equity, highlighted the gender issues and their special relevance to cartographers and outlined the gender-based research that could promote better working relationship between men and women.

77 A paper on the Production of Line Mapping in Lesotho Using Digital Photogrammetry was also presented. The paper outlined the status of mapping in Lesotho starting with the colonial era to the present time and enumerated the various advantages in the use of line maps by the various local institution, and also described the main technical equipment used. A project for the production of large scale line mapping of Maseru was successfully undertaken followed by small scale map production of specific areas of the country. The success in these activities confirmed the feasibility of using local capability to produce digital maps with the technical collaboration of relevant international institutions.

(b) The role of the private sector

78 The first paper (ECA/NRD/CART.9/5) was on the Contributing Role of the Private Sector in Mapping and other Geo-information System in Africa document. The paper surveyed the institutional and organizational structure of the national mapping agencies and the problems attendant to their operations with regard to the marketing of their products to the users. These problems were in the area of policies, market research, and lack of understanding of the user requirements. It also proposed measures for removing the constraints and recommended the national mapping agencies to reorient themselves in order to respond effectively to the needs of the public and private sectors.

79 The second paper (ECA/NRD/CART 9/ORG 36) was on the Case for Encouraging the Private Sector in Mapping, Remote Sensing and GIS in Africa. The paper focused on the need to encourage the private sector to play a major role in mapping, remote sensing and GIS activities in developing countries. The activities would respond to the needs and demands for information on natural resources which is essential for planning and decision making for sustainable development. A functional private sector was expected to be characterized by activities in creating awareness, changing attitudes in the new technologies. To do this, the private sector had to overcome numerous obstacles before it could become an equal player in natural resources management and information development in developing countries. Furthermore, the private sector had to overcome the political, economic, financial, institutional, social, human resources and technological constraints in order to become a viable partner in mapping and remote sensing activities.

80 During the discussion of the presentations in (a) and (b), questions were raised as to the role of ACI in attracting women cartographers. It was explained that ACI encouraged member States in the education and training of women cartographers. In view of the small numbers of women cartographers in some countries the Conference was urged to adopt a resolution urging member States increase the participation of women in this profession.

81 With regard to private sector participation in mapping and geo-information activities, it was observed that private sector activities were just building up and could not be expected to meet the growing demand for these services. It was also observed that there was some reluctance on the part of the private sector to invest without being assured of probability. In this regard governments were urged to provide incentives which could motivate increased investment by the private sector and encourage its participation at the tendering for the execution of technical services. Relatedly national mapping services should be further strengthened in relation to the increasing demand for their services and be empowered to retain revenue generated through the sale of their services and products.

(c) New Directions

82 Six papers were submitted under this sub-agenda item. The first paper (ECA/NRD/CART 9/ORG 2) on Cartography and Development. In search of a new dynamics to ensure the Insertion of African Cartography in development Projects indicated that the inadequate geo-information is one of the main causes of failure, delay, or even abandonment of certain development projects. The paper further discussed a study carried out by AOCRS in two Phases (August 1990-December 1991, and January 1992-April 1993). The study, it was noted, came up with a number of proposals and recommendations for action for the decision-makers. The final objective of these proposals and recommendations was to search for a new dynamics for inserting the necessary and adapted cartography into development projects.

83 The second paper (ECA/NRD/CART 9/ORG 37) dealt with the contribution of remote sensing to the management of spatial information in food security. Remote sensing provided viable and synoptic information which is used as a basic tool for inventorying, monitoring and a proper management of resources. Its applications included land tenure and utilization, monitoring and modelling of agricultural production, prevention of famine, monitoring of insects harmful to crops, monitoring of bush fires, management and development of water resources. In view of these, it is recommended that the elaboration of national action plans on sustainable development, should take into account the management of spatial information indispensable to food security programmes.

84 The third paper (ECA/NRD/CART 9/6) titled Resource and Environmental Information Management indicated that GIS has become the new creed for all those who deal, in one way or the other, with land resource development, environment protection and all other activities related to land. This was to a great extent, a result of the improvement in the capacity of these systems to cope with increasing amounts of spatial information of different type and its ability and flexibility to process and display the data according to different uses and planning scenarios. At national level, it is necessary for decision makers to understand the modern information technologies and their potentials for resource management.

85 The fourth paper (ECA/NRD/CART 9/ORG 40) was on Direction of Surveying, Mapping and Remote Sensing in view of emerging technologies. The paper indicated that in view of the developments in space technology and improvements in electronic data gathering equipment, the role and function of a surveyor and cartographer have also considerably changed. Therefore their professional training and education need to be in line with the changes. Modifications of educational curriculum for modern surveying and mapping experts were proposed in order to enable them to participate fully in project planning and implementation, data gathering, management and presentation.

86 The fifth paper (ECA/NRD/CART 9/ORG 38) titled Maps and Mapping The ACI vision of the future reviewed how technological changes were influencing cartography in both production and use On the production side, GPS and GIS technologies are the most evident factors Current trends and future possibilities were noted and longer-term convergence between the scientific spatial disciplines was inevitable But a new focus has to be made on the users of geographic information in this respect, the International Cartographic Association is promoting major attention to the interface between data and users through cartographic visualization processes

87 The sixth paper (ECA/NRD/CART 9/ORG 8) was on the Changing Roles and Mandates of African National Mapping Institutions vis-à-vis the Advent of new Geo-information Technology dealing with the mandates and roles of National Mapping Institutions (NMI's) in Africa and the resultant changes, necessitated the new geo-information technology in terms of institutional arrangement, structural adjustment, survey laws and regulations, commercialization of new products, personnel structure, and education and research Also the paper reviewed the new mandates arising from the development of national spatial database for GIS and LIS The role of the private sector and sources of funding through technical cooperation, government subsidy and internally generated funds were also discussed

88 In the discussions that followed the issue of Airborne GPS controlled points for aerial photographs was clarified Further, it was stressed that mapping institutions should change their approach towards their clients and deliver demand driven products and services It was proposed that these institutions should also improve their marketing techniques

Any other business (agenda item 9)

89 Under this agenda item, a representative of the secretariat drew the attention of the participants on the need to revise the name of the United Nations Cartographic Conference for Africa to properly reflect the scope of the subject and respond to the new technology being applied in the member States During the discussions several proposals were made for the new name These were geomatics, geo-informatics, geo-spatial information However, some delegates expressed the need to refer the matter to their national agencies before a final decision is taken by the Conference

90 The President of the International Society for Photogrammetry and Remote Sensing (ISPRS) presented awards to the Ethiopian Mapping Authority (EMA) and the African Association for Remote Sensing of the Environment (AARSE) for their distinguished performance

Adoption of the report (agenda item 10)

91 Under this agenda item two issues were considered First, the Chairman of the Resolution Committee presented a draft resolution, whose text is attached to this report as an Annex, and was adopted after a detailed discussion Second, the Conference examined the draft report and adopted it after some amendments were made

Closure of the Conference (agenda item 11)

92 Mr P A Traore, OIC, Natural Resources Division, speaking on behalf of the Secretariat, congratulated the participants on their hard work which contributed to the success of the Conference He reminded that the participants were ambassadors in the implementation of the recommendations of the Conference Finally, he thanked the members of the Bureau, the Resolutions Committee, and the Government of Ethiopia for their special contributions to the meeting

93 The Chairman thanked all the participants for the hard work done then he declared the meeting closed

RESOLUTIONS OF THE NINTH UNITED NATIONS REGIONAL CARTOGRAPHIC CONFERENCE

The Conference,

Acknowledging the measures taken by African countries and the efforts being made in capacity building in the fields of cartography, remote sensing and Geographic Information Systems as well as the acquisition of new technologies in these fields,

Convinced that these developments are the logical results of multiple appeals made by previous conferences,

Realizing the need for continued efforts by all African countries and for further capacity building,

Recognizing the importance of reliable spatially related information for sustainable development,

Taking note of the advances in technology to acquire, process, analyze and disseminate spatially related information,

1 Encourages member States to

(a) establish spatially related information systems consisting primarily of cadastral, topographic, demographic, land cover and land use information as a matter of urgency and to make this information available for development projects,

(b) support through their national mapping agencies the Africover project,

(c) use the regional centres to facilitate capacity building,

(d) allocate adequate funds for capacity building and the transfer of technology in the planning of development projects,

(e) take cognizance of the need for the participation of women in cartographic activities in countries where this is not being done,

(f) establish a national committee on Geographic Information to coordinate activities and advise governments on the use of technology and spatially related information,

(g) establish a national committee for the standardisation of geographic names where these do not exist or reactivate existing committees,

(h) provide an enabling environment for the stimulation of the private sector, and

(i) facilitate the creation of professional associations in the fields of surveying, cartography, remote sensing and geographic information systems

2 Urges maritime African States and those with navigable waters to express support for the establishment of regional hydrographic and nautical charting facilities,

3 Further urges member States to

(a) cooperate in the establishment of regional data standards and a unified geodetic datum, and

(b) make concerted efforts to pay their arrear contributions to the regional organisations in the fields of cartography and remote sensing to which they belong and those who have not acceded to the agreement establishing these centres to do so urgently

4 Requests member States to provide information required by ECA and AOCRS to complete and maintain their cartographic and related inventories,

5 Requests the Economic Commission for Africa to

(a) establish and maintain a database on the status of mapping and baseline information coverage in Africa, including the extent and age of coverage, output formats, technologies in use, cadastral survey and mapping programmes, physical and human resources and gender participation,

(b) accelerate the completion of the digital cartographic Atlas and update it,

(c) establish and maintain a database of educational and training facilities and programmes in Africa and disseminate this information,

(d) coordinate, together with AOCRS and the regional centres, the establishment of a working group to investigate and recommend regional data standards for spatially related information,

(e) compile and publish the proceedings of the Ninth Regional Cartographic Conference for Africa,

(f) coordinate the setting up of a regional remote sensing programme for Africa based on the concept of technical cooperation between countries, and

(g) convene the tenth Regional Cartographic Conference for Africa in 1999,

(h) submit the resolutions of the ninth conferences to the Council of Ministers and to monitor and report the progress made by member States in implementing them,

(i) consider establishing working groups at the next conference to enable delegates to discuss technical papers prior to reporting to the plenary session,

6 Requests ECA and AOCRS to cooperate in harmonising and integrating their cartographic and related inventories,

7 Appeals to donors and other funding agencies to give support to

(a) the national mapping agencies in capacity building and their activities

(b) the Africover project,

(c) improving the services that regional centres and organisations are mandated to provide,

(d) the working group on data standards, and

(e) the setting up of a regional remote sensing programme for Africa based on the concept of technical cooperation between countries

VOTE OF THANKS TO THE ECONOMIC COMMISSION FOR AFRICA

The Conference,

Realizing the amount of work involved in preparing and arranging the conference and in providing the necessary secretariat,

Thanks the Economic Commission for Africa for having made available to the conference the facilities and staff which have enabled it to carry out its work under the most favourable conditions

LIST OF DOCUMENTS SUBMITTED TO THE CONFERENCE

DOCUMENT NO.	TITLE
Documents submitted by ECA	
ECA/NRD/CART 9/1	Draft Provisional Agenda
ECA/NRD/CART 9/2	Draft Provisional Annotated Agenda
ECA/NRD/CART 9/3	Report of the United Nations Economic Commission for Africa to the 9th United Nations Regional Cartographic Conference for Africa
ECA/NRD/CART 9/4	Remote Sensing A tool for sustainable development An assessment of the remote sensing activities in Africa
ECA/NRD/CART 9/5	The contributing role of the private sector in mapping and other geo-information systems in Africa
ECA/NRD/CART 9/6	Framework of basic Conditions and Guidelines for the establishment of a national resource and environmental geographic information system
ECA/NRD/CART 9/7	Status of mapping coverage and programmes in Africa
ECA/NRD/CART 9/8	The Changing Roles and Mandates of African National Mapping Institutions vis-à-vis the advent of new geo-information technology
Documents Submitted by Governments	
ECA/NRD/CART 9/EGYPT 1	Medium Scale Mapping from Spot Stereo Imagery based on an approximate and simplified approach for data processing
ECA/NRD/CART 9/EGYPT 2	Spot Satellite System Theory and practice
ECA/NRD/CART 9/EGYPT 3	The Egyptian survey authority and the Rio Declaration on the Environment and Development
ECA/NRD/CART 9/USA 1	The status of cartographic activities in the United States of America
ECA/NRD/CART 9/USA 2	A global approach to update the bathymetric data and nautical chart datums
ECA/NRD/CART 9/USA 3	Meeting of the working group on toponymic data files and gazetteers
ECA/NRD/CART 9/USA 4	Development of a computer-assisted revision system for nautical chart production
ECA/NRD/CART 9/USA 5	The vector product format, an overview
ECA/NRD/CART 9/USA 6	Office cost survey modernization plan

DOCUMENT NO.	TITLE
ECA/NRD/CART 9/USA 7	U S Geological survey standard for digital raster graphics
ECA/NRD/CART 9/USA 8	Building a production system to support the national digital orthophoto program an integration challenge
ECA/NRD/CART 9/USA 9	The U S National Spatial data infrastructure
ECA/NRD/CART 9/ETH 1	Cartographic Activities in Ethiopia
ECA/NRD/CART 9/ETH 2	An overview of remote and proximal sensings for eutrophic state estimation of lakes
ECA/NRD/CART 9/ETH 3	Assessment of human impact on the physical environment using remote sensing and GIS techniques in Ethiopia
ECA/NRD/CART 9/ETH 4	The collection and standardization of geographical names
ECA/NRD/CART 9/ETH 5	Interpretability of scanned aerial photographs
ECA/NRD/CART 9/ETH 6	The new technological advances in cartography at the Ethiopian mapping authority
ECA/NRD/CART 9/BEN 1	L'information géographique au Bénin
ECA/NRD/CART 9/CAMR 1	Rapport du Cameroun
ECA/NRD/CART 9/CONG 1	Contribution du Congo
ECA/NRD/CART 9/COTE 1	Rapport d'Activités du Centre de Cartographie et de Télédétection (CCT) Bureau Nationale d'Etudes Techniques et de Développement (BNETD)
ECA/NRD/CART 9/MOZ 1	Securing Traditional land rights in Mozambique
ECA/NRD/CART 9/MOZ 2	Mapping and Cadastre in Mozambique
ECA/NRD/CART 9/MOZ 3	Securing Traditional Land Rights in Mozambique
ECA/NRD/CART 9/LESOTHO 1	Lesotho National Report
ECA/NRD/CART 9/GUINEE 1	Institut de topographie et de cartographie de Guinée (ITCG)
ECA/NRD/CART 9/MADAG 1	Place de l'Information Géographique et le système d'Informations Environnementales dans le Plan d'Action Environnementale Malgache
ECA/NRD/CART 9/MAROC 1	Royaume du Maroc - Rapport National
ECA/NRD/CART 9/MALAWI	Report on Cartographic Activities in Malawi
ECA/NRD/CART 9/MALAWI 2	Phased approach to the development of land information system by Ministry of Lands and valuation in Malawi
ECA/NRD/CART 9/NIGERIA 1	National Report of Nigeria for the Ninth United Nations Regional Cartographic Conference for Africa
ECA/NRD/CART 9/RSA 1	The National Capabilities in the Field of Cartography, Remote Sensing and Geographic Information Systems Republic of South Africa

DOCUMENT NO.	TITLE
ECA/NRD/CART 9/RSA 2	The Conversion of the South African Geodetic Network to WGS84 and the Potential for a Unified Southern African Network
ECA/NRD/CART 9/TANZ 1	Atlas mapping in Tanzania An African Case Study
ECA/NRD/CART 9/ZIM 1	Progress on the development on national capabilities in fields of cartography, remote sensing and geographic information systems in Zimbabwe
ECA/NRD/CART 9/BOTS 1	Technology Transfer through institutional cooperation
ECA/NRD/CART 9/BOTS 2	Progress report 1993-1996 Department of Surveys and Mapping - Republic of Botswana
ECA/NRD/CART 9/UGAN 1	Report on Cartographic Activities in Uganda for the period 1993 to 1995
ECA/NRD/CART 9/COTEDIV 1	Rapport D'Activites du CCT, BNETD
ECA/NRD/CART 9/SEYCHEL 1	République des Seychelles rapport sur l'Etat de la Cartographie
ECA/NRD/CART 9/TUNISIE 1	Rapport National sur la Cartographie en Tunisie
ECA/NRD/CART 9/TUNISIE 2	La teledetection et les systemes d'information géographique en tunisie - rapport NATIONAL
ECA/NRD/CART 9/UK 1	United Kingdom Report on Cartographic Activities in Africa (Submitted by the United Kingdom)
ECA/NRD/CART 9/TANZ 2	Status of surveying and mapping in Tanzania and strategies for the 21 century
Documents submitted by organizations	
ECA/NRD/CART 9/ORG 1	Thematic mapping for development and management of shared water resources in the ESCWA region
ECA/NRD/CART 9/ORG 2	African Cartography in search for a new dynamic for its insertion into development projects (AOCRS)
ECA/NRD/CART 9/ORG 3	Interpreted digital spacemap (SPOT IMAGE0
ECA/NRD/CART 9/ORG 4	Rapport d'activité de C R T O
ECA/NRD/CART 9/ORG 5	Centre Regional de Télédetection des Etats d'Afrique du Nord (C R T E A N)
ECA/NRD/CART 9/ORG 6	Cartographic data manipulation and utilization
ECA/NRD/CART 9/ORG 7	Development of hydrography, nautical cartography and bathymetric mapping in African waters (International Hydrographic Bureau)
ECA/NRD/CART 9/ORG 8	The National Council for Geographic Information (CNIG)
ECA/NRD/CART 9/ORG 10	Mapping the Earth with SPOT (SPOT IMAGE)

DOCUMENT NO.	TITLE
ECA/NRD/CART 9/ORG 11	Commercial Earth Observation Satellites. International Society for Photogrammetry and Remote Sensing, ISPRS
ECA/NRD/CART 9/ORG 12	International Cartographic Association - Progress During 1991-95
ECA/NRD/CART 9/ORG 13	Topographic Mapping from Satellite Imagery in Africa
ECA/NRD/CART 9/ORG 14	Development in Digital photogrammetric systems for topographic mapping and GIS/LIS applications
ECA/NRD/CART 9/ORG 15	Atlas Mapping in Tanzania An African Case Study
ECA/NRD/CART 9/ORG 16	Desertification dynamic monitoring in arid and semiarid zones of North Africa, by remote sensing
ECA/NRD/CART 9/ORG 17	Educational aspects of remote sensing technology transfer in Ethiopia and India
ECA/NRD/CART 9/ORG 18	Satellite image maps and topographic maps in scales 1 50 000 and 1 25 000 elaborated digitally
ECA/NRD/CART 9/ORG 20	Airborne laser scanning - a new RS method for terrain mapping
ECA/NRD/CART 9/ORG 21	RS based forestry mapping in Ethiopia and Sudan - Abstract
ECA/NRD/CART 9/ORG 22	Geomorphology of the blue Nile by Remote Sensing
ECA/NRD/CART 9/ORG 23	La Cartographie de l'occupation du sol à partir de l'imagerie de haute résolution
ECA/NRD/CART 9/ORG 24	Geographic approach to studying environmental problems global and regional landscape mapping and assessment through RS techniques
ECA/NRD/CART 9/ORG 25	The use of geographic information systems and the cartography to increase local council resources
ECA/NRD/CART 9/ORG 26	Application of RS and GIS for land use planning in the South Desert of Egypt
ECA/NRD/CART 9/ORG 27	Topographic and cartographic databases developed in South Africa
ECA/NRD/CART 9/ORG 28	Cartographic data manipulation and utilization Remote Sensing Data Information Networks
ECA/NRD/CART 9/ORG 29	Information Networks for Earth Observation Data - Overview of Recent Canadian Developments (Remote Sensing Data Information Networks)
ECA/NRD/CART 9/ORG 30& ADD 1	AFRICOVER PROJECT (The Faso Africover Project and the possibility for unified datum for Africa)
ECA/NRD/CART 9/ORG 31	New Courses and Programme Direction of the ITC Geoinformatics Department (Staff development in mapping and similar institutions)

DOCUMENT NO.	TITLE
ECA/NRD/CART 9/ORG 32	Mapping (Geomatics) related Education Trends and Needs in Africa (Cooperation in Mapping related education in Africa)
ECA/NRD/CART 9/ORG 33	Constraints and opportunities in human resources development in Africa in the field of earth resources and environmental information
ECA/NRD/CART 9/ORG 34	Gender and Cartography
ECA/NRD/CART 9/ORG 35	Scope, objectives and functioning of PAIGH towards regional and intercountry cooperation
ECA/NRD/CART 9/ORG 36	The case of encouraging active participation of the private sector in mapping and remote sensing
ECA/NRD/CART 9/ORG 37	La Gestion de l'information spatiale pour la sécurité alimentaire et le développement durable
ECA/NRD/CART 9/ORG 38	Maps and Mapping The ACI vision of the future
ECA/NRD/CART 9/ORG 40	Direction of Surveying, mapping and remote sensing Education in view of the emerging technology
ECA/NRD/CART 9/ORG 41	Potential application of high-resolution remotely sensed imagery for urban planning
ECA/NRD/CART 9/ORG 42	The acacia initiative Communities and the information society in Africa



UNITED NATIONS

ECONOMIC AND SOCIAL COUNCIL

ECONOMIC COMMISSION FOR AFRICA

Ninth United Nations Regional
Cartographic Conference for Africa

Addis Ababa, Ethiopia
11-15 November 1996

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