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A UNIFIED GEODETIC DATUM FOR AFRICA

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Since 1987, several proposals on how to achieve the goal of establishing a Unified Geodetic Datum for Africa (UGDA) have been made and discussed at various African and International Symposia. A lot of work has been carried out to implement this goal although complete achievement has yet to be made.

In this paper the author reviews the status of the UGDA since the ADOS project was completed in 1986. The stages so far completed to implement one of the main objectives of the UGDA, of the ADOS project are outlined. a summary of the proposals made to achieve the UGDA is made. Finally the author proposes how these proposals can be used by the African Geodesists to establish a Unified Geodetic Datum for mapping Africa.

1. INTRODUCTION

The African Doppler Survey (ADOS) project was launched in 1980 and the final results were published in 1986.

The main aims of ADOS were as follows:

- to provide a zero-order control for future geodetic networks for mapping control;
- to provide a control for Datum Unification and strengthening;
- to provide improved geodal information for Africa and
- to provide coastal calibration points for GEOS C altimetry.

Of the four goals, the commission for Geodesy for Africa decided that the second purpose was the most urgent. This is because the mapping of Africa is based on very heterogeneous and discontinuous control established by the then colonial surveying urgencies to meet the needs of their rulers in each country.

Africa after most of its member states became independent, has tried more and more to carry out continental development programmes such as communications, oil pipelines and the inventory and exploitation of common natural resources, such as that in rivers and oceans.

All these projects require maps or some data derived from maps.

However, as these maps are based on different datums, they have not been very useful in the planning and execution of such projects. The alternative has been to carry out completely new surveys and mapping, a very expensive and time consuming exercise. This is why the need for a Uniform (Unified) geodetic datum was realised as early as 1963 during the first UNRCCA held in Nairobi, Kenya. This goal has been relentlessly pursued ever since and the ADOS project was one of the several means for achieving it.

Following the completion of ADOS, several African and International geodesists have presented proposals as to how the Datum for Africa can be realised. In this paper we will summarise these proposals and from here see if one of them or several proposals can be used to achieve the goal set out by the UNRCCA nearly thirty years ago.

2. IMPLEMENTATION OF THE UNIFIED DATUM FOR AFRICA

Since the last UNRCCA held in Ougadougou, Burkina Fasso in 1989, several proposals have been made by a number of geodesists both in Africa and Internationally. In May 1990, the 4th CGA Symposium was held in Tunis, Tunisia. The African Integrated Geodetic Network was one of the key topics. Five papers were presented and discussed under this topic. The main one which formed the core of the discussion was 'Post ADOS Strategy for Unified Networks for Africa (Chodota, 1990)'.

As a follow up to this discussion, it was resolved to establish an ad Hoc Committee to prepare a programme of implementing the Unified Geodetic Network or Datum for Africa. This proposal was supported by the IAG and which funded the activities of the ad Hoc Committee.

The Committee carried out its work mainly through correspondence. However, in December 1990, it was able to meet at Aswan, Egypt, during the 3rd International Symposium on Recent Crustal movements in Africa. After reviewing the proposals, it was agreed to present a final proposal at the XXth IUGG General Assembly in Vienna, Austria, in August, 1991.

In Vienna, the issue was exhaustively discussed both in the CGA meetings and the IAG Executive Committee Meetings. Finally, recognising the importance of this agenda, the CGA Executive Committee decided to form a special Working Group to be convened by the Nairobi Centre on behalf of CGA to implement the proposals of the ad Hoc Committee.

At the same time, the IAG Executive Committee also resolved to place this important project under a new sub-commission under IAG Commission X - Continental Networks. CGA and Commission X are now supposed to liaise in the actualization of this project. In addition to all this, the IAG Executive Committee, in recognition of the importance of Geodetic activities to development, established an IAG Committee for the Developing Countries.

There are eight members in this Committee. Three of the members come from the African Continent, namely, Wassef, Charfi and Chodota. Two come from South America and two from Asia (Louis 1992). The three members from Africa will ensure that the geodetic priorities for Africa are vigorously pursued in international forums.

3. THE FUTURE

The implementation of this important goal will depend on the application of modern geodetic techniques. Several proposals, eg. Aduol (1991), Nino (1991), Ezeigbo (1991), etc have been presented by various geodesists in Africa. Most depend on the application of the Global Positioning System (GPS) to either link the 300 ADOS points network or establish a new GPS network. Whatever solution is adopted, the time for implementation is much overdue.

There is an urgent need for Africa with the assistance of international donors to either compute a Unified Datum from the ADOS data or else resolve to measure a new GPS network covering the continent. Whatever technique is adopted, the final datum will also be an International Datum as both satellite systems are also being used by the other continents.

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