



# “WMO Climate Data Management and Data Rescue projects and related international Coordination”

*Medare 2<sup>nd</sup> Workshop, Nicosia*

*Hama Kontongomde*

*WMO/OBS/DMA*

# Modernization of Climate Data Management

- Substantial efforts in modernizing climate data management and data rescue in various regions
- Most of the new installations Climate Data Management Systems and Data rescue were supported through the WMO Voluntary Cooperation Programme (VCP)
- WCDMP has organized several training workshops for Developing Countries and Less Developed Countries in the Pacific SIDS, the Caribbean, Africa and South East Asia.

# Climate Database management Systems

- **CLIDATA** (CHMI – ATACO)
- **CLISYS** (Meteo France – MFI)
- **CLIWARE** (Russian Federation)
- **CLIMSOFT** (Zimbabwe-Guinea-Kenya-Metoffice)
- **JCDMS** (Jordan)
- **CLDB** (Slovakia - MicroStep-MIS)

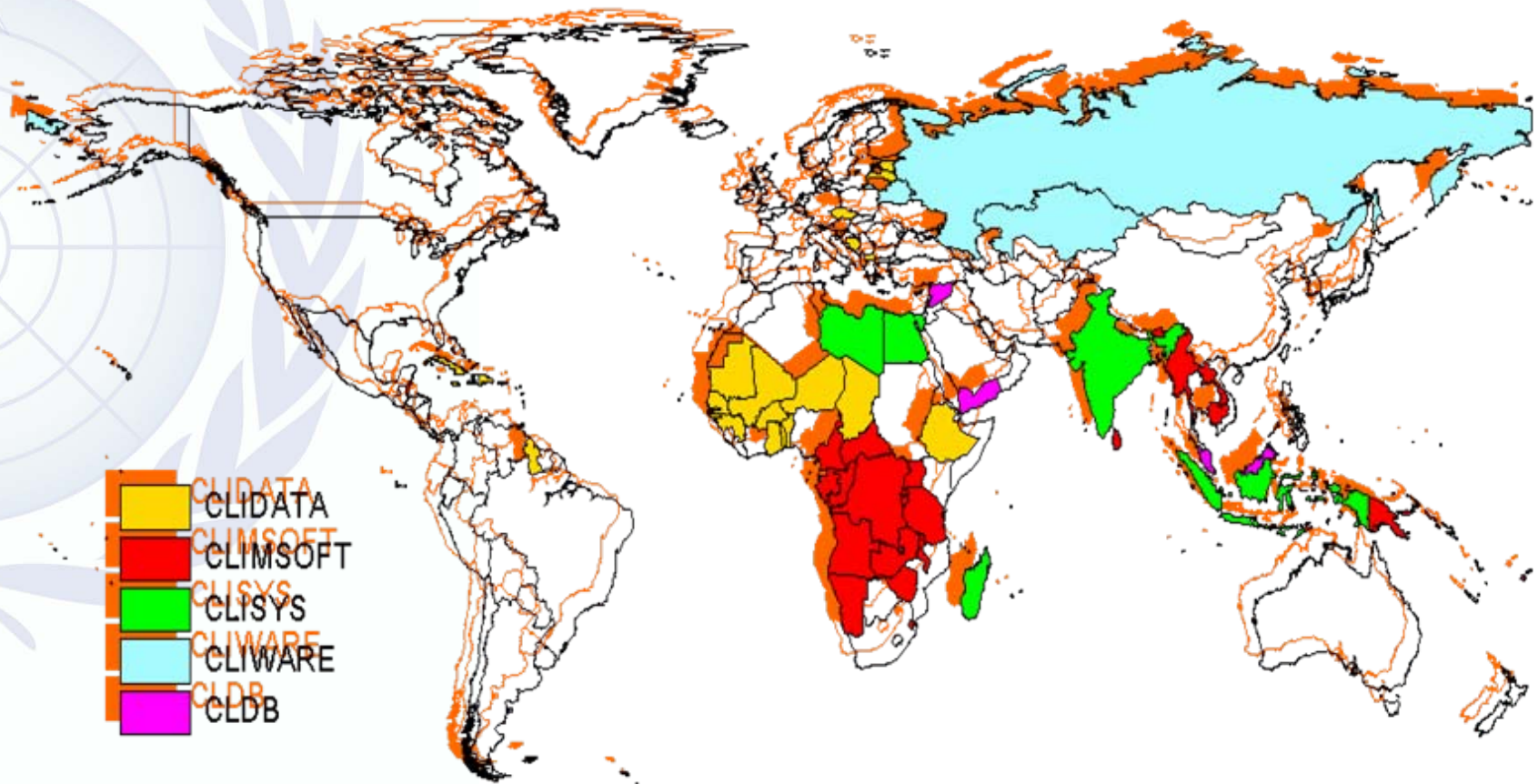




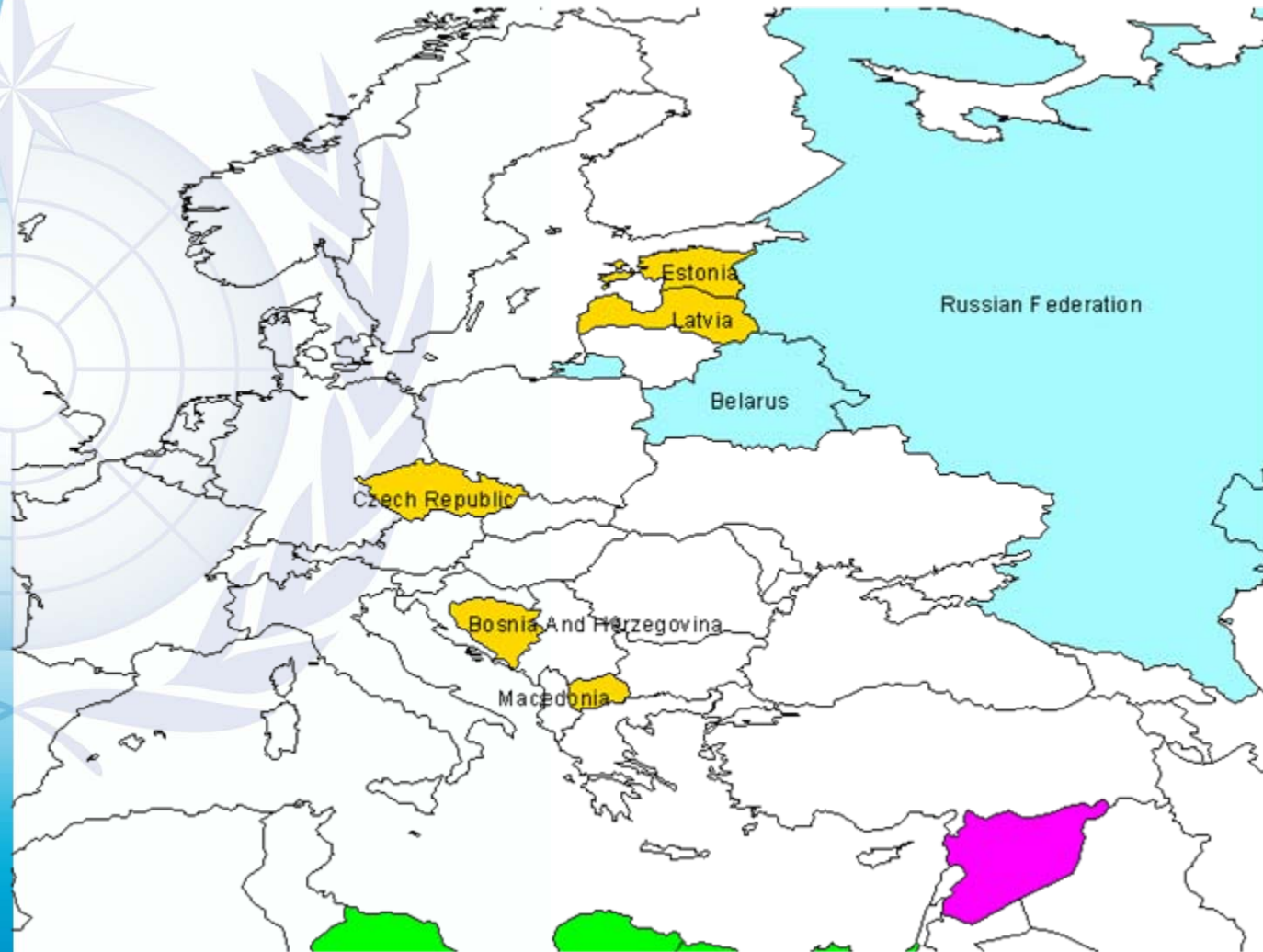
# Licenses

- Private companies CDMSs
  - **CLIDATA**
  - **CLISYS**
  - **CLDB**
- License free Systems
  - **CLIWARE**
  - **CLIMSOFT**
  - **JCDMS**
  - **CLICOM**

# Systems installed



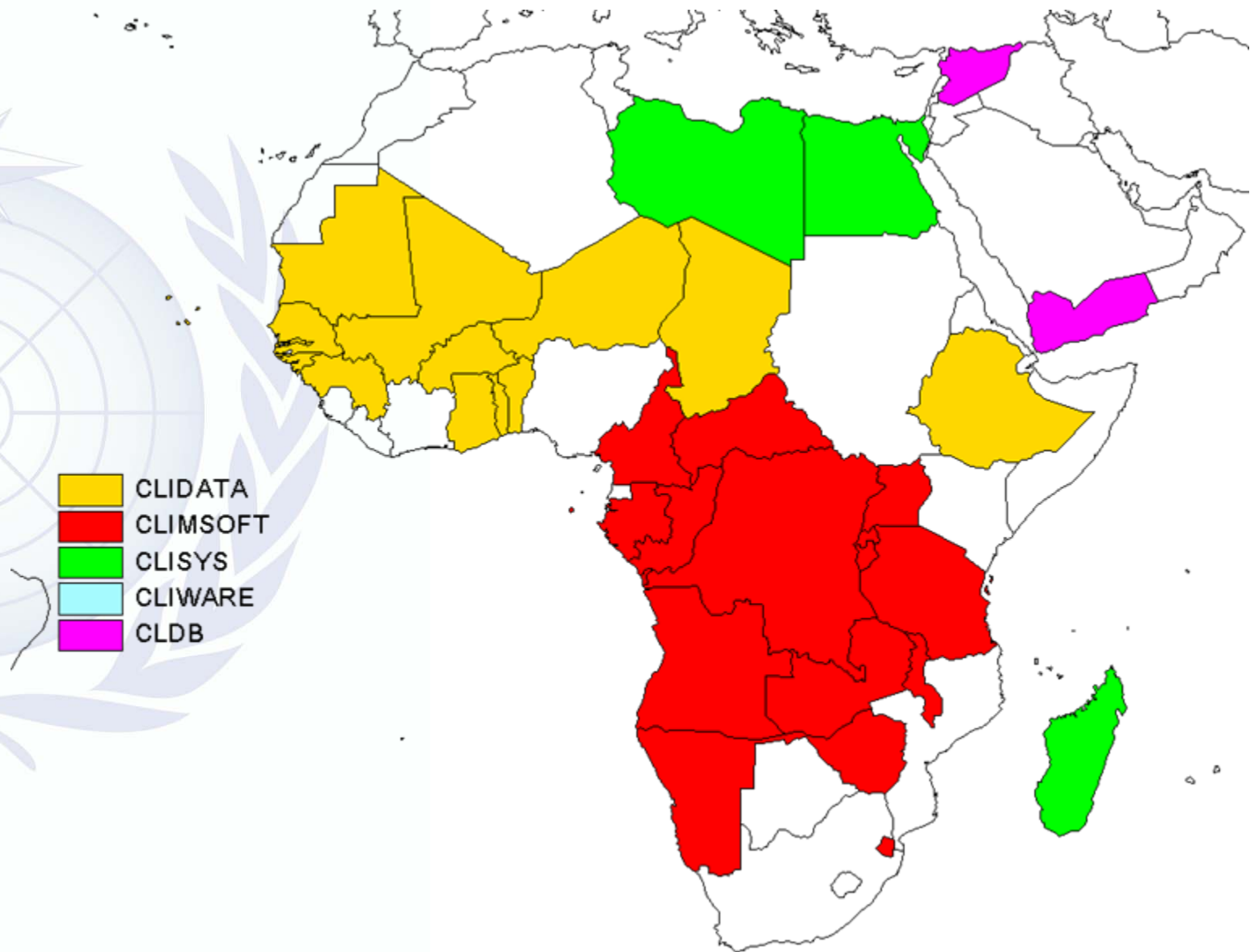
# Europe



- CLIDATA
- CLIMSOFT
- CLISYS
- CLIWARE
- CLDB



# Africa



# Regional Coordination

- **West Africa**

- AGRHYMET for CLIDATA
- ACMAD for CLIMSOFT



- **Caribbean**

- CIMH Barbados (CLIDATA and CLIMSOFT)



- **Pacific**

- Bureau of Meteorology of Australia (new system based on Climsoft)





# TRAINING WORKSHOPS

- Niger
- Fiji
- Trinidad & Tobago
- Rwanda
- Congo
- Vietnam
- Barbados



# Training

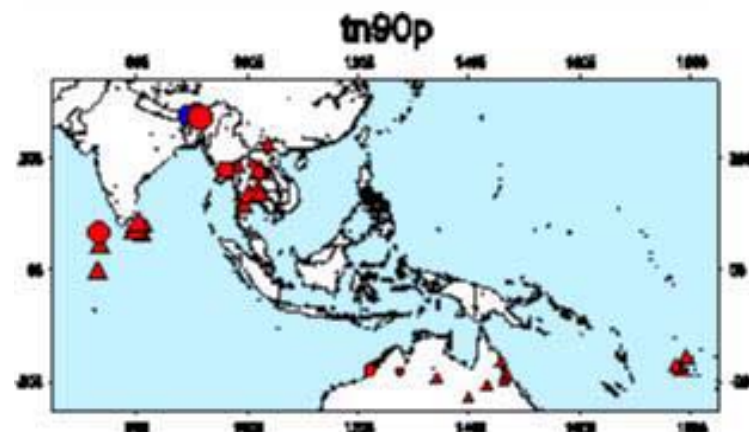
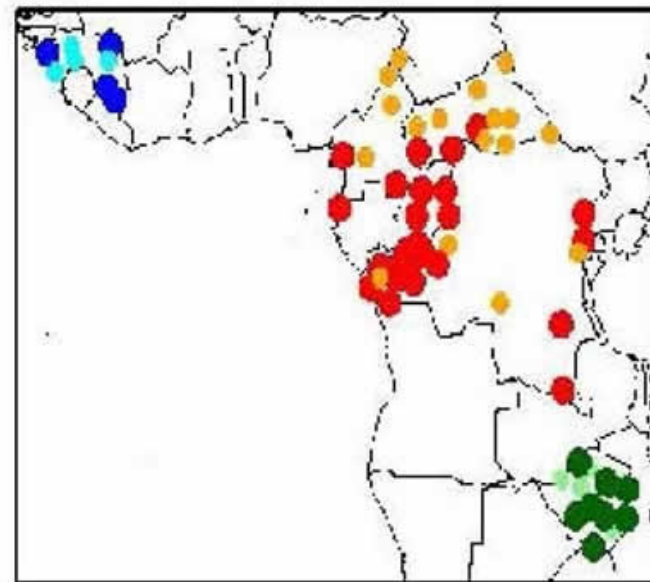
## Main challenges

- Problems of :
  - Time (not enough)
  - Configuration and Transfer of data (not possible during regional training sessions)
- Computer skills of participants
- (Access or Oracle)



# CDMS and Climate change indices

- Two workshops on Climate change indices (temperature and precipitation extreme indices) organized back to back with Climsoft workshops
- Brazzaville, Congo for the Central African region 23-27 April 2007
- Ha Noi, Viet Nam for the South –East region (3–7 December 2007)





## Congo Workshop, Brazzaville April 2007



Published JGR, 2009

### Changes in Temperature and Precipitation Extremes in Western Central Africa, Guinea Conakry and Zimbabwe, 1955-2006

Aguilar, E.<sup>1</sup>, Barry, A.<sup>2</sup>, Brunet, M.<sup>1,3</sup>, Ekang, L.<sup>4</sup>, Fernandes, A.<sup>5</sup>,  
Massoukina, M.<sup>6</sup>, Mbah, J.<sup>7</sup>, Mhanda, A.<sup>8</sup>, do Nascimento, D.J.<sup>9</sup>,  
Peterson, T.C.<sup>10</sup>, Thamba, O.<sup>11</sup>, Tomou, M.<sup>12</sup>, Zhang, X.<sup>13</sup>

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<sup>6</sup> Direction de la Météorologie National du Congo

<sup>7</sup> Direction de la Météorologie National du Cameroun

<sup>8</sup> Zimbabwe Meteorological Services Department

<sup>9</sup> Instituto Nacional de Hidrometeorologia e Geofisica of Angola

<sup>10</sup> NOAA's National Climatic Data Center, Asheville, North Carolina, USA

<sup>11</sup> Agence Nationale de Météorologie et de Télédétection par Satellite, METTELSAT

<sup>12</sup> Aviation Civile et de la Météorologie of the Central African Republic

<sup>13</sup> Climate Research Branch, Meteorological Service of Canada, Downsview, Ontario, Canada.





# Development of High Quality Datasets

# Quality assurance and control of observational data

- Quality assurance should start at the station level :
  - change of instrumentation,
  - change of location,
  - shift from manual to automatic stations etc.
- QC at the station level (Real-time QC)
- This will insure more quality to current and future use (Climate extremes, Numerical Weather Prediction models, real time data presentations in decision aiding systems, seasonal forecast, aid for the meteorologist and climatologist in their work).



# Datasets homogenization

- Standardized homogenization tests need to be widely used to create high quality datasets.
- Unfortunately, only a limited number of experts are familiar with the scientific and technical development of methods and tools to conduct standardized homogeneity tests and corrections.

# Homogeneity

- Scientific and technical methods and tools to conduct standardized homogeneity tests and corrections exist
- Some standardisation of homogeneity testing would surely be desirable. However, up to now there is no single test, which may be called the absolutely best one and might be proposed for that purpose.
- It is therefore considered of major importance to keep focus on this line of work and expertise in order not to loose the knowledge and expertise.

# Role of RCCs in the development of Climate datasets

- **Operational Data Services, to support operational LRF and climate monitoring:**
  - Develop regional climate datasets, gridded where applicable;
  - Provide climate database and archiving services, at the request of NMHSs;

# Role of RCCs in the development of Climate datasets (cont'd)

- RCCs are expected to perform certain functions (e.g. for homogeneity testing; database management; metadata management, statistical evaluation of climate data, etc. ) using the Guide to Climatological Practices, other procedures and guidelines proposed by CCI and other WMO Commissions.



# Climate records preservations (rescue)



# Rescue Preservation and Digitization of Climate Records

- The International Environmental Data Rescue Organization (IEDRO) and WMO in Africa and Latin America (US funding).
- ACMAD data rescue under ClimDev Africa
- The MEDARE Initiative in the Mediterranean Basin



# Climate Data Rescue and Digitization (DR&D) efforts

- WMO has entered into a cooperative agreement with the International Environmental Data Rescue Organization (IEDRO) to support and provide assistance to National Meteorological and Hydrological (NMHSs) services in various regions with data rescue efforts to maximize the benefits from the small financial resources through the WMO VCP.

# Countries involved in the IEDRO project

- **Africa**

- Kenya, Tanzania, Zambia, Mali, Niger, Senegal, Mozambique, Malawi, Namibia and Uganda

- **Latin America**

- Guatemala, Paraguay, Chile and Bolivia

# Activities under the WMO-IEDRO project

- Assist in providing the training, equipment, and software to allow the national meteorological services to digitally photograph their paper-based records onto a more stable medium (CD-ROMs) and get those CDs to NOAA's NCDC for digitization.
- Provide for the digitization of those original, surface and upper-air data (taken by rawinsondes and PIBALS) from either a printed medium, microfiche/microfilm or a digital photograph.

The image shows a meteorological data form. The top section is titled 'TABLEAU CLIMATOLOGIQUE MENSUEL' and includes fields for 'ANNEE', 'STATION', and 'ETAT'. Below this is a section for 'RESUME CLIMATOLOGIQUE DU MOIS' which contains a grid for recording monthly data. The form is filled with handwritten information, including dates and numerical values. The bottom section is titled 'CARACTERES DOMINANTS DU MOIS' and contains a small table with columns for 'Mois', 'Temps', 'Vent', 'Nébulosité', 'Pluie', and 'Neige'. The form is dated '17 01 2004'.



# ACMAD Data rescue project under ClimDev Africa

- ClimDev is an African development programme to integrate Climate Risk Management (CRM) into pertinent policy and decision processes throughout the continent
- A data rescue component of the Climdev will consist in digitizing the microfilms created under the Belgium project



# MEDARE Initiative

- The goal of MEDARE is to develop a comprehensive high quality climate dataset for the Greater Mediterranean Region (GMR) with a focus on the Essential Climate Variables (ECV) of the Global Climate Observing System (GCOS).

# WMO endorsement

- The WMO 60th Executive Council (Geneva, 18-27 June 2008) has endorsed the MEDARE initiative as well as the action-plan which includes the creation of a web portal for information exchange on DARE in the GMR.



A photograph of a modern, curved glass skyscraper under a clear blue sky. A blue flag with a white logo is flying from a tall pole on the roof. The building's glass facade reflects the sky and surrounding greenery. In the foreground, there are green trees and a utility pole with power lines.

**Thank you**