Data and Information Management

Supporting Decision Making

Africa Adaptation Programme

www.undp-aap.org

Strengthening resilience to any threat – whether of a climate or non-climate origin – starts with identifying and understanding the risks. Access to data that describes the problem, and the ability to analyse it and apply it to planning, is fundamental for ensuring climate resilient sustainable development.

Twenty countries across Africa are working with the AAP to develop the infrastructure and capabilities needed to access, analyse and apply data – through the use of decision support systems such as contemporary tools, methods and data – to build the resilience of their national development strategies.

Infrastructure

Hardware

The AAP supports the procurement, installation and maintenance of High Performance Computing (HPC) servers – inexpensive, off-the-shelf 'supercomputers' – capable of storing and managing large datasets, generating and analysing climate models and sharing climate data between AAP countries.

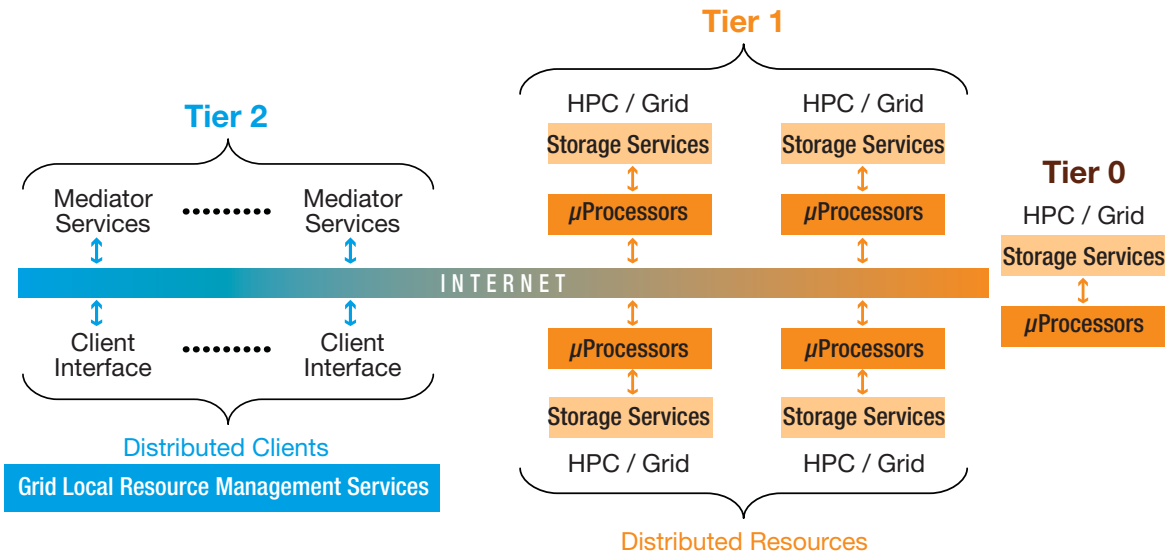
Software

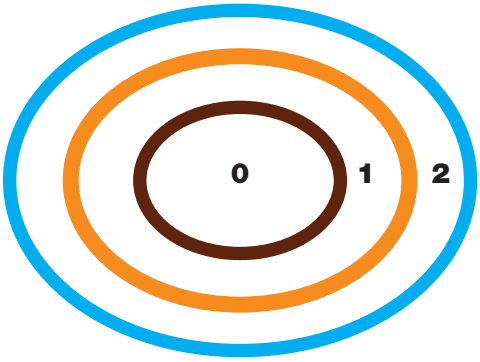
The AAP is promoting the use of the RAMADDA server, an open source data and content management system developed by University Corporation for Atmospheric Research that runs on inexpensive computing systems and provides access to heterogeneous, geo-spatial and multi-disciplinary data forms. These include raw and processed data, real-time climate conditions and predictions, regional and global climate models, and output from geographic information systems. Its searchable database can generate information on different regions and from different applications for decision-makers. Together with RAMADDA, the Integrated Data Viewer (IDV) can be used to create powerful graphics that assist with the understanding of climate processes and projections and can also be used as a communication tool for engaging stakeholders. The AAP also supports the use of sectoral and multi-sectoral decision support tools as well as early warning systems.

Multi-tier High-Performance Computing

The AAP promotes the use of a multi-tier HPC infrastructure that enables each country to engage at the level that matches its current capabilities, with a view to upgrading this level whenever possible.

- **Tier 0:** This tier consists of a central node large enough to host a considerable amount of data. The International Centre for Theoretical Physics (ICTP) has adequate technical staff and infrastructure to maintain and house the system, as well as to assist with capacity development.
- **Tier 1:** Five African regional centres form Tier 1, which has the same capacity for creating and





storing data as Tier 0. Tier 1 is hosted by countries where the required Internet and electricity (speed and stability) are already established.

- **Tier 2:** Formed by all AAP countries that can access the system remotely through a central web-portal. Tier 2 provides advanced usage through lightweight (open source) desktop software distributed by the Regional Team.

Data Analysis and Application

The AAP offers training and support to National Team members to build their capacity in the installation and management of HPC climate servers, the operation of scientific software for data analysis and the application of findings to planning through:

- regional workshops on HPC Climate Data Servers/E-Infrastructure;
- sector-specific training toolkits that match country-specific needs; and
- technical assistance through the AAP's programme-wide regional Helpdesk.

Partnerships

The AAP works closely with five centres of excellence that provide technical support and networks essential in addressing climate science and data needs:

- **International Centre for Theoretical Physics (ICTP):** ICTP has built the scientific capacities of developing countries for almost 50 years. ICTP provides the AAP Regional Team with technical support and services for E-Infrastructure in Africa and organises at least two HPC/E-infrastructure activities in Africa every year.

The Centre also has a strong Earth System Physics group actively involved in climate modelling and training for climatologists and application scientists.

- **World Meteorological Organisation (WMO):** WMO is the UN's authority on the state and behaviour of the Earth's atmosphere, its interaction with the oceans, its climate and the resulting distribution of water resources. The AAP partners with the WMO to provide training workshops related to use of regional climate scenarios.
- **African Centre of Meteorological Applications for Development (ACMAD):** ACMAD strengthens the partnership between Africa and the world in environmental areas related to sustainable social and economic development. The Centre focuses on services for social and economic sectors, such as agriculture, water resources, public health and safety.

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It also develops climate and environmental products that benefit regional and national activities. ACMAD and the AAP produce training workshops on both climate scenarios and outputs for water resource management at the regional level.

- **Agriculture, Hydrology, Meteorology Regional Centre (AGRHYMET):** AGRHYMET, composed of nine member states, is a specialised institute of the Permanent Interstate Committee for Drought Control in the Sahel (CILSS). Specialising in the science and techniques applied to agricultural development, rural development and natural resource management, AGRHYMET has several objectives: to help

achieve food security and increased agricultural production in CILSS member states, to improve natural resource management in the Sahelian region and to provide training and information to development stakeholders and partners. AAP and AGRHYMET hold training workshops on both climate scenarios and water resource management.

- **The Coordinated Regional Downscaling Experiment (CORDEX):** CORDEX is sponsored by the World Climate Research Programme. It seeks to organise an international coordinated framework to produce an improved generation of regional climate change projections world-wide for input into impact and adaptation studies. In response to the critical need for data analysis and capacity development, a consortium of organisations consisting of the AAP, WCRP, the University of Cape Town's Climate Systems Analysis Group (CSAG), START, the International Centre for Theoretical Physics, the Swedish Meteorological-Hydrological Institute and the Climate and Development Knowledge Network Initiative have developed an analysis and training program to provide an initial assessment of CORDEX output that is regionally focused and prioritised to Africa's knowledge needs.

Benefits

Among the practical benefits to participants are the abilities to:

- *generate and/or access* robust, up-to-date, climate data;
- *analyse* data and generate national climate impact scenarios; and
- *apply* the resulting knowledge in the development of optimal climate adaptation strategies for integration into national development plans.

Costs

The cost of delivering the in-country AAP e-infrastructure in each AAP country (data access, HPC, tools and methods) is roughly US$50,000 over a period of 3 months. This includes the procurement of an HPC climate data server, installation assistance and training associated with the management of climate data servers and analysis of climate data.

For more information on Identifying Risks to Sustainable Development, please visit: www.undp-aap.org/data-information

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