

An innovative framework for sustainable development in Africa



Sahara and Sahel  
Observatory

.....  
Knowledge

.....  
Dialogue

.....  
Joint action  
.....

# > Key words

# Virtuous

# circles



## The Sahara and Sahel regions are more home to hope

than to despair. It is in these regions, that we can tangibly feel the tuggings of the vicious circle of land degradation, climate changes, biodiversity erosion and poverty.

Yes, it is here, along the regions' cusps of survival – or not – that the world can walk the talk of conferences and conventions, compare its resolutions with its resolve, and understand how many front lines can be drawn in the sand.

Yet it is here that virtuous circles of solidarity and fruitful partnerships are making new paths toward sustainable development.

> *land degradation, desertification, water scarcity, biodiversity depletion, climate change, poverty, migration.*

## Land degradation and water

are the two major issues at the juncture of most of the environmental stress, poverty and scarcity of resources in the OSS region.

## Here,

the extremes are wide, the stakes high, the demands tall. The fragility of survival depends on a scant handful of certainties – rainfall, seasons, winds, diverse species – that become more uncertain by the day. Here, the proverb that if you cannot have what you want, you must want what you have, is a way of life – it seems.



*“poverty, scarcity and degradation rub the Earth’s salts deep into each other’s wounds”*

## Today,

where solidarity is an age-old way of coping with that fragility, each community’s tragedies bounce into the other’s misfortunes, in a perverse reflection of that same solidarity. A surge of flooding, or of drought, provokes a surge of migrant people; a rise in the thermometer pushes down soil fertility.

> *environmental security, trans-border interaction, joint management*

## Now,

the vulnerabilities, and the excesses, of other communities and other cultures far away impinge on life and survival within the Sahel and Sahara rings, as humanity’s share in climate change becomes tangible. Equally, the misuse of land, of water and of biodiversity within the rings adds its price to the global menu.

> *environmental degradation, climate change, climatic extreme events, resource depletion.*

More change lurks below the surface, where nothing human has ever been except our thirst. Listen. The trickling of water tables to lower, barely accessible depths. The sound of aquifers being sucked dry. The clamour of tomorrow’s thirstier communities, kicking at their inherited, imposed poverty.

## A change is going to come.

Our change. We live in just one unjust world where, as we share risks and misfortunes, so we can share challenges. The key challenge in these areas is to share responsibilities and manage resources, with one eye on today’s needs and the other on tomorrow’s.

The rich patrimony of traditions and knowledge systems of millennia in the region provides the basis for cooperation and for creating new virtuous circles of research, new paradigms of partnership. International and African initiatives such as NEPAD and the Millennium Development Goals, as sources of hope, provide the framework. We are working for new heights of scientific applications, for new modes of observation, for new modes of sharing information and its use by the decision makers for concrete actions and – this is the point – new levels of change rooted in our keywords.

> *knowledge, dialogue and joint action.*

## Seeing things the same way

To monitor natural resources,

and to continually interpret trends in their presence and use, are the first steps towards sound environmental management.

At the front line of the joint combat against land degradation, protecting biodiversity, mitigating of and adaptation to climate changes – central to making development more sustainable – monitoring is an essential weapon.

In much of Africa, the environmental focus is on land degradation: two-thirds of the continent is classed as desert or drylands and 46% of the land area is vulnerable to desertification. Yet, despite these home truths, most development policies and strategies are reactive, aiming at managing crises and their aftermath, rather than proactive early warning and prevention. And so natural phenomena become natural catastrophes.

It need not be so. Indeed, with its mission of enabling its member countries and organisations to generate and manage environmental information, the OSS approach aims at sound management of natural resources through better knowledge of their proper use and potential.

With uniformly reliable  
baseline data,

practitioners can share and build up knowledge on the dynamics of land

*“joint action for  
combining local  
knowledge and  
field and earth  
observation data”*

degradation in specific ecosystems. This includes the impact of human activities – both local through, say, deforestation and farming, and from near and afar, through induced climatic changes.

Following common methodologies and standards, land use changes and changes in biodiversity habitats – and in the potential emissions of greenhouse gases from animals and land and the potential of biomass cover to capture carbon – can be monitored, assessed and reported at local, national, sub-regional and regional levels.

### Three pillars for governance

The three basic components of the OSS Environmental Observation and Monitoring Programme aim at strengthening environmental governance in the countries and sub-regions of the OSS.

- Environmental monitoring through a growing family of national observatory networks, solution-driven with substantial data
- Environmental early-warning systems enabling member countries to anticipate, predict and adapt to change
- Impact assessment and monitoring of various measures taken to address environmental degradation, providing guidelines for overall development policies and programmes.



Modelling techniques can show the dynamics of ecological and socio-economic systems, climate variability and/or climate change and their possible implications, and feed early-warning systems for decision makers to be able to consider ecological threats – and opportunities – in the short-term and further ahead.

## Improving data access and availability

is key to delivering to national and international stakeholders information which is reliably sourced, properly analysed and authoritatively interpreted for the purposes of planning and decision making. Here, the OSS Environmental Observation and Monitoring Programme has two thrusts. Firstly, to work with local and national partners and strengthen and/or mobilise their capacities in collecting, accessing, sharing and interpreting data. Special emphasis is paid to the combination of field and earth observation data.

This approach strengthens National, sub-Regional and Regional Action Plans and programs as defined by the Multilateral Environmental Agreements (UNCCD, UNFCCC and UNCBD). It also provides sturdy support to attaining the national and regional priorities indicated by Agenda 21, the New Partnership for Africa's Development (NEPAD) and the Millennium Development Goals.



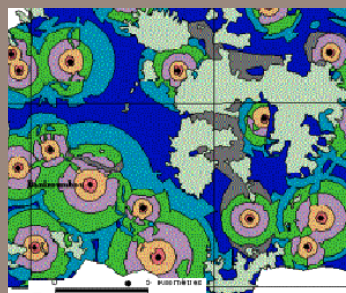
The second thrust is to facilitate joint action for standardising data, using common data sets and indicators, and agreed exchange formats.

## By adding value to the investments

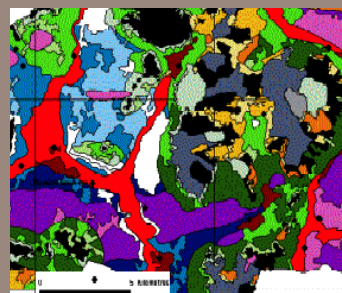
made by national stakeholders, the monitoring-evaluation work of OSS is capitalising towards the future. The accumulated, shared wealth of data now demands wider, deeper access, for reliable information is capital for sound environmental governance. This requires data flows along the 'knowledge chain' presented according to the needs of selected audiences and users: local communities, researchers and decision and policy makers.

### Risk assessment: agriculture and land degradation (ROSELT-OSS 'Banizoumbou' observatory, Niger, 1993)

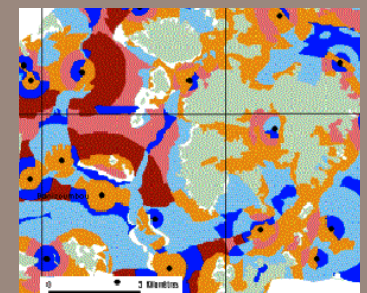
Homogeneous farming practices



Landscapes and grasslands/ woodlands



Sensitivity index of soils to degradation



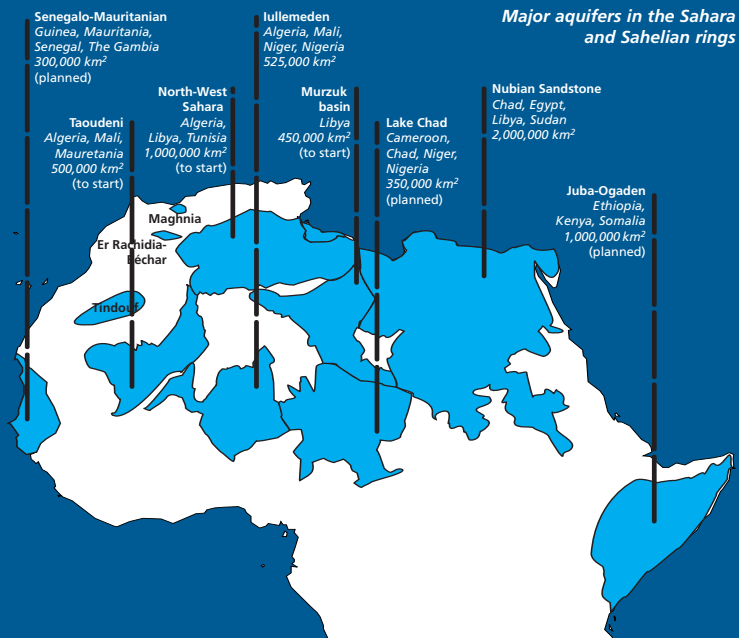
# > Water Handle with care

## Water is the Great Leveller. The ultimate

democrat, it has great power to focus and unite minds. And the scarcer it is, the more imperative is its sound management. The water resource of the OSS action area is mainly in major aquifers and basins. As in any arid, semi-arid and sub-humid drylands with irregular rainfall, they are a strategic resource for economic and social development – especially during droughts.

The known resources – comprehensive data are still lacking for some – are under pressure from the competitive pin-pricks of development. In many cases, the rate of depletion for drinking water, agriculture and export-based agro-industry is soaring above the natural rate of recharge from rainfall.

*Water scarcity = less than 1,000 m<sup>3</sup> per person per year. By 2025, it will reign OSS countries Algeria, Cape Verde, Egypt, Ethiopia, Kenya, Libya, Somalia and Tunisia.*

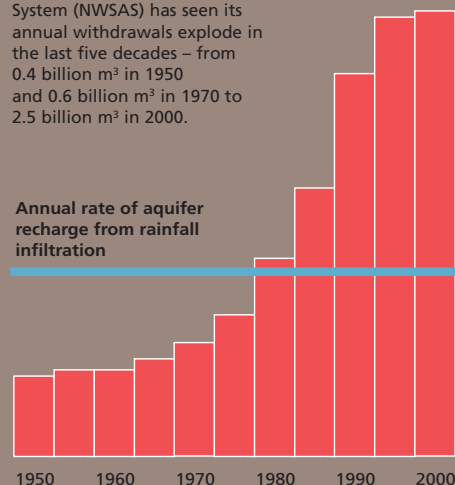


## Give and take, take, take

*"Simply continuing the present pace of abstraction could be very dangerous" – NWSAS Report, 2002*

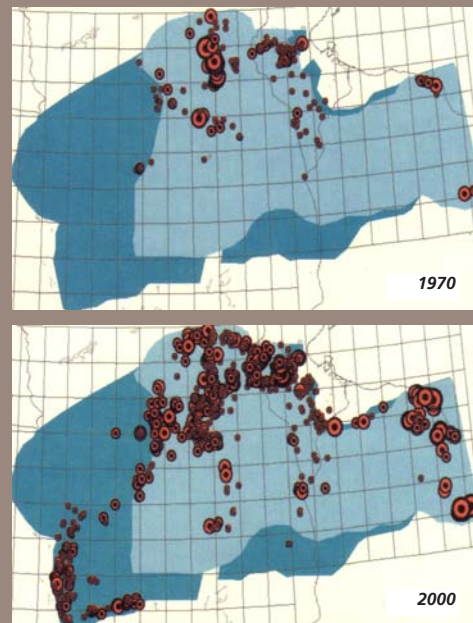
Exploited for more than a century, the North-West Sahara Aquifer System (NWSAS) has seen its annual withdrawals explode in the last five decades – from 0.4 billion m<sup>3</sup> in 1950 and 0.6 billion m<sup>3</sup> in 1970 to 2.5 billion m<sup>3</sup> in 2000.

Annual rate of aquifer recharge from rainfall infiltration



## The pin-pricks of development

*As the water drawdowns expand exponentially, from more and more pumping sites, where are the limits to growth?*



The consequences of depletion are dire: water and soil quality worsens, already aggravated by changes in climate causing less precipitation and increased evaporation. At one extreme lies drought. At the other, the heavier rains of irregular wet seasons can provoke erosion and water logging.

## The implications cross many borders, not only

geopolitical. Scientific, social, agricultural and environmental norms and practices are all challenged, as are those of water governance. Without the emergence, upstream, of effective transborder management of shared aquifers

*“a long process of dialogue has created a basin awareness”*

### Three pillars of ownership

The OSS Water Programme approach, developed in the NWSAS project, has three methodological thrusts. Based on action by national partners, with support from OSS, it maximises ownership:

- Encouraging a shared vision of the situation, based on expanded knowledge
- Elaborating common scientific and technical standards in an information system on shared aquifers and basins and risks and potentials in their use. It links hydrologists, geologists, economists and environmentalists and provides a permanent, reliable base of information for decision makers
- Facilitating countries in the design and set up of institutional frameworks for joint management of shared resources.

and basins, the value of steps downstream to adjust water consumption will evaporate. The joint management of shared water resources, typified by the OSS Water Programme, is in fact a key portal to other imperatives such as combating desertification, the mitigation of – and adaptation to – drought and climate change, eradicating poverty and improving living conditions.

## The value of sound governance

of transborder waters is shown in the North-Western Sahara Aquifer System (NWSAS) where 1 million km<sup>2</sup> are shared by Algeria, Libya and Tunisia. Exploited for more than a century, its annual withdrawals have exploded 600% in 50 years – from 0.4 billion m<sup>3</sup> in 1950 and 0.6 billion m<sup>3</sup> in 1970 to 2.5 billion m<sup>3</sup> in 2000. In the NWSAS project, the three countries mandated OSS to act as a facilitator. A long process of dialogue has created a ‘basin awareness’. Building on earlier bilateral initiatives, the project has worked, since 1997, to pool scientific and technical information. A common database of about 9,000 water points is linked to a mathematical model which allows sound spatial representation of resources, and forecasting simulations.

## This jointly-designed aquifer knowledge system

has formed the basis for national decision makers to form a framework for common policies. Transborder cooperation can help shape consensual planning and participatory models involving all stakeholders, particularly local communities.

The OSS approach on the NWSAS basin is being applied in the joint project of Mali, Niger and Nigeria on the Iullemeden Aquifer System. Its potential is being recognised for other similar basins such as the Nubian sandstone and Juba Ogaden systems. Elsewhere in Africa, where most water resources are transborder, the basin awareness approach could underpin common policies for economic development and integration.

# > Research for development

## Mobilising the African scientific community

*“knowledge bases in the  
Sahara and Sahelian rings”*

Sharing plans needs a  
framework, and

nowhere more than in research. The emergence of common programmes between research institutions, with a special emphasis on local capacity is, for OSS, a cross-cutting priority.

The ‘Research for Development’ programme of OSS aims at bridging the gap between the worlds of development and research. By mobilising the African scientific community, it seeks to maximise the involvement of research teams in the definition of environmental research topics pertinent to African drylands in general and desertification in particular. This approach will enhance overall advances in the strategic areas of OSS concern: environment, land degradation, drought, biodiversity, climate change and joint management of shared water resources. As such, it demonstrates the importance of synergies between research, policy and practice where research provides a sound basis for decision making.

Through enabling research teams  
and networks

to organise and to develop and fund projects, the programme adds value to South-South and North-South-South exchanges and strengthens knowledge bases in the Sahara and Sahelian rings.

By focusing on the OSS Environment and Water programmes, the Research programme aims to capitalise upon their results. Upstream, themes are deduced for further research whilst, downstream, new elements and insights help to define further action. Innovation is central in identifying research topics: priorities include identifying and moulding the instruments of environmental governance and building the ‘degradation equation’ – what, for example, are the costs of environmental degradation and of inaction, in economic, social, ecological and development terms?

*Changes in soil  
composition –  
studied here at the  
Biopedology  
laboratory in  
Dakar, Senegal –  
affect fertility,  
water retention,  
and carbon gas  
emissions*



*At the  
Abdeladim  
watershed lake  
in Tunisia, data  
on rainfall and  
water levels are  
tele-transmitted  
to researchers*

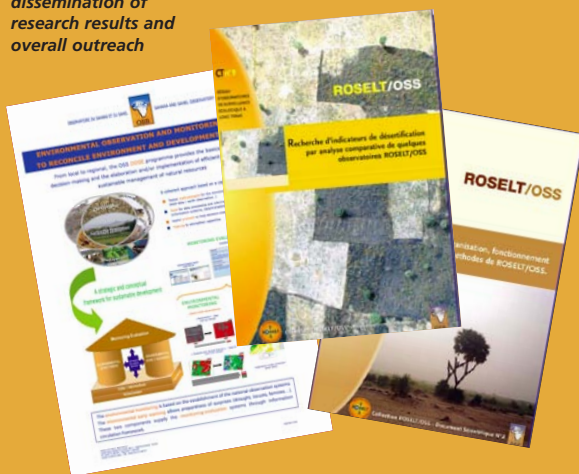


*Sharing research  
methodologies  
such as these  
enables better  
coverage of  
research topics  
throughout the  
region*

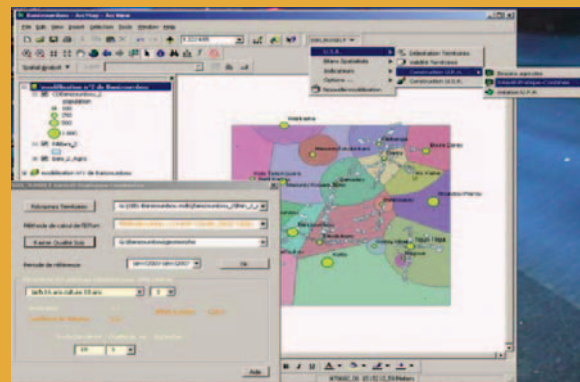
# > Information and outreach

## Networking goes with the information flow

*Publications serve as decision-support tools, dissemination of research results and overall outreach*



*The online library is a wealth of data and reports, including full text searching, programmes such as ROSELT and NWSAS, and the GEO OSS Map Server of data from OSS country partners and external sources*



**Breathe in, breathe out,**

breathe networking. Visibility is the key to more than just the effective dissemination of information.

OSS aims at enabling its member countries and organisations and partners to share knowledge resources, to add value to each other, and to shape and sustain a collective effort which plays an important part in such broader strategies and global goals such as those set out in Agenda 21 and the Multilateral Environmental Agreements, the NEPAD initiative and the Millennium Development Goals.

**A pro-active communications strategy**

is the surest route to involve all stakeholders, through regular and customised information – and incorporating their own. It is also the

*“shape and sustain a collective effort”*

way to ensure that the achievements made by OSS and its partners, as well as their concerns, resonate in the wider communities dealing with the same focus themes. Each group of stakeholders in OSS programmes benefits from information tailored to their professional and thematic needs. This can range from distributed databases, common modelling tools, Web-based libraries, selective dissemination of information (SDI), publications, research reports, newsletters to multimedia products. Efforts are made to ensure that information is shared between various groups, in a cross-cutting style.

Human communication is essential, for the transfer of knowledge occurs not only on paper or electronic media. Regular professional contacts underpin information exchange, and are strengthened by training opportunities.

# > OSS

# Sharing

our place  
in international  
commitments

## As a framework for North-South-South partnership,

OSS has a clear mission in mobilising and developing the capacities of its members and partners to address environmental problems along with sustainable development and poverty – with a particular focus on water and land degradation issues.

The role of OSS is squarely within the context of international environmental commitments (Agenda 21, UNCCD, UNFCCC, UNCBD) for sustainable development in the arid, semi-arid and dry sub-humid zones of Africa.

OSS focuses on enhancing African capacities to produce, manage, share and disseminate information applicable to sustainable natural resource management.

## OSS acts as a facilitator,

to promote synergies and to mobilise North-South-South partnerships. It is a flexible organisation with light structure.

OSS membership is open to African countries and sub-regional and regional organisations as well as to non-African partners.

Its founding principle is to work alongside member states and organisations, and not to act in their place.

### ■ Structure

In the decision making bodies of the OSS, as defined in the Constitution, consensus is given a privileged position.

**The General Assembly** meets every four years, bringing together all members and partners, to review past activities and to define the Programme of Activities for the coming four years.

**The Executive Board** meets once a year. It adopts the budget and monitors the functioning of the organisation and of the Programme of Activities.

#### **The Strategic Orientation**

**Committee** is a consultative body to provide strategic guidance to the executive organs.

**The Executive Secretariat** assures the implementation of decisions taken by the Executive Board and General Assembly, and of the Programme of Activities.

## ■ Members and partners

(November 2005)

### Countries

Algeria (UMA)  
Burkina Faso (CILSS)  
Canada  
Cape-Verde (CILSS)  
Chad (CILSS)  
Côte d'Ivoire  
Djibouti (IGAD)  
Egypt  
Eritrea (IGAD)  
Ethiopia (IGAD)  
France  
Germany  
Guinea Bissau (CILSS)  
Italy  
Kenya (IGAD)  
Libya (UMA)

Mali (CILSS)  
Mauritania (CILSS / UMA)  
Morocco (UMA)  
Niger (CILSS)  
Senegal (CILSS)  
Somalia (IGAD)  
Sudan (IGAD)  
Switzerland  
The Gambia (CILSS)  
Tunisia (UMA)  
Uganda (IGAD)

### Sub-regional African organisations

Arab Maghreb Union (UMA)  
Intergovernmental Authority  
on Development (IGAD)  
Permanent Interstate Committee for  
Drought Control in the Sahel (CILSS)  
Community of Sahel-Saharan States  
(CEN-SAD)

### Regional and international organisations

African Centre of Meteorological  
Applications for Development (ACMAD)  
African Organization of Cartography and  
Remote Sensing (AOCRS)  
Food and Agriculture Organisation of the  
United Nations (FAO)  
United Nations Convention to Combat  
Desertification (UNCCD)  
United Nations Educational, Scientific and  
Cultural Organization (UNESCO)  
United Nations Organisation General  
Secretariat (UN-GS)

### Civil society

Environmental Development Action in the  
Third World (Enda-TM)

## ■ The OSS time line

### July 1989

A project emerged in the international community for "an observatory of the Saharan areas, which answers the need to monitor the development of that rapidly deteriorating, fragile, arid region, in order to protect it more effectively". It received the support of the Summit of the G7 group of states.

### May 1992

The Observatory of the Sahara and the Sahel (OSS) was officially created as an international association at its founding conference in Paris, France and located at UNESCO headquarters.

### February 1997

In Niamey, Niger, the General Assembly of the OSS decided to adopt the status of an international organisation and to transfer its seat to an African country from its initial location hosted at UNESCO in Paris, France. The Assembly adopted the OSS 2000 Strategy which clearly adopted Agenda 21 and the UNCCD as basis for the OSS strategic framework.

### March 2000

Following an extraordinary conference held in Rabat, Morocco, the OSS became an international organisation established in Tunisia, under the terms of the Host Agreement between the Government of Tunisia and UNESCO, signed on 18 June 1999 and ratified by Tunisia under law 2000-12 of 7 February 2000.

### April 2004

In Tunis, Tunisia, the 2nd session of the OSS General Assembly adopted the 2010 Strategy. It extended the strategic vision of the organisation to the major Multilateral Environmental Agreements (UNCCD, UNCBD, UNFCCC) and to African and international initiatives such as NEPAD and the MDG.

## ■ The international time line

### June 1992, June 1994

At the United Nations Conference on the Environment and Development (UNCED) held in Rio de Janeiro, Brazil, also known as the Earth Summit, the UN member states adopted the Conventions on Biodiversity (UNCBD) and on Climate Change (UNFCCC). Two years later the convention on Combating Desertification (UNCCD) is adopted.

### September 2000

At the Millennium Summit of the United Nations, world leaders of 191 countries agreed to the Millennium Development Goals (MDGs) for "combating poverty, hunger, disease, illiteracy, environmental degradation and discrimination against women by 2015".

### April 2002, Abuja, Nigeria

The African Ministerial Council on Water (AMCOW) was formally launched to provide political leadership, policy direction and advocacy in the provision, use and sustainable management of water resources in Africa.

### August- September 2002

The World Summit on Sustainable Development, Johannesburg, South Africa adopts the Johannesburg Plan of Implementation detailing actions to be implemented to promote sustainable development. The plan included specific actions for Africa.

### June 2003

The African Ministerial Conference on the Environment, meeting in Maputo, Mozambique, endorsed the Action Plan of the Environment Initiative of the New Partnership for Africa's Development (NEPAD).

*"enhancing African capacities in information  
for sustainable natural resource management"*



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Sahel landscape,

Burkina Faso.

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Students in the IRD

biopedology lab in

Dakar, Senegal.

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Measuring rainfall and

water depth, Abdeladim

hill reservoir, Tunisia.

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