



**Michigan State University
Center for Global Change
and Earth Observation**



**Université Cheikh Anta Diop
De Dakar, Laboratoire
d'Enseignement et de Recherche
en Géomatique (LERG)**

**Institute of geography,
University of Copenhagen-Danemark**



Action Plan for West African Remote Sensing/GIS Network

Draft proposed by LERG (UCAD)



Drafting Committee: Cheikh Mbow¹, Amadou T. Diaw¹, Brent Simpson², David Skole², Kjeld Rasmussen³

¹ Institut des Sciences de l'Environnement, Faculté des Sciences et Techniques, LERG, ESP, UCAD (Sénégal)

² Center for Global Change and Earth Observation, Michigan State University (USA)

³ Departement of Geography and Geology, University of Copenhagen (Danemark)

Context

Environmental change, related to both natural processes of climate change and to social processes, including land use change, is of great significance in West Africa and it strongly influences options for economic development and poverty alleviation throughout the region. Few West African countries possess the required understanding of environmental change processes taking place. This lack of understanding in turn limits the governments to make informed decisions on environmental issues. Universities and research institutions in the region play a leading role in developing this understanding, and the proposed project aims at strengthening this capacity. Several networks have been established in the past through the UAF (Agence Universitaire de la Francophonie), but these have not been specifically targeted at research. Still, the West African countries share a number of characteristics, with respect to the environment, yet their capacities within environmental research and monitoring differ considerably and there is a need to enhance the collaboration and exchange of ideas and experiences among the research institutions in the region.

Remote Sensing and GIS are becoming emerging disciplines among West African Universities. Very likely this new technology will play an important role in the development of various sectors related to land management, social and physical environmental issues. To better strengthen the establishment of an African expertise on Remote Sensing and GIS, the Michigan State University (USA) and the University Cheikh Anta Diop-Dakar (UCAD, Senegal) have recently initiated a West African Workshop to create a network of RS/GIS developers and users for a better South-South collaboration and good linkage with Northern laboratories. This workshop has been granted by the START program and was organized at the University Cheikh Anta Diop of Senegal during the summer of 2005⁴. The main outcome of this workshop was to create a West African network including about 15 countries in the sub-region and decided to propose a science plan document to be discussed during a workshop to be held in 2006. The idea of the network is to set a more dynamic and effective integration of researchers for a better expertise sharing and improved support of the decision makers in West Africa.

This working document proposes the main initiatives and actions to be taken within the West African Remote Sensing/GIS network with a focus on main research orientations and decides what steps are needed to achieve the main goals of the network. Therefore, it includes main goals for the network with an embedded thematic orientation and a broad time table for activities implementation. To be effective, the network should clearly agree on steps through which it will promote project design and implementation on mainstream research topics proposed in this text.

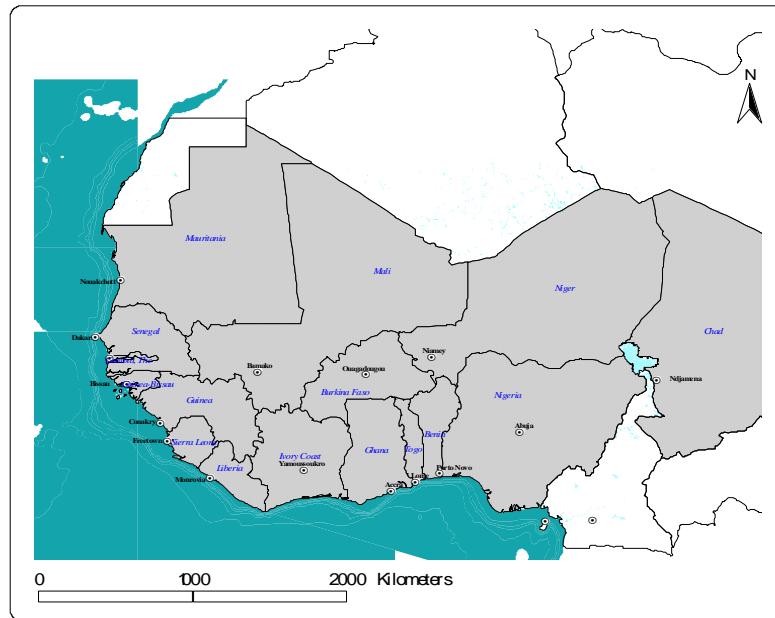
The essence of the West African Network is its diversity to trigger interdisciplinarity and complementarity of actions. Several disciplines and languages are involved, but the majority of the participants are french speakers. Various country needs and characteristics are thus required to achieve a good balance through efficient coordination. This West african diversity is a great advantage for scientific exploration of environmental issues and could lead to a very interesting and useful outcome.

⁴ The Theme of the workshop was: "Setting the Benchmark – What do we Know/What is our Future? A science review and synthesis workshop on the long-term impacts of environmental change in West Africa"

It is the idea of this project to establish a network of universities and research institutions in West Africa which can assist regional transfer of research capacity and build on the comparative advantages of the different partner universities.

The pathways proposed in this document is more organic than structural. Therefore, stages could sometimes overlap, and we have to be very flexible, for instance by changing the goals as we progress, or be ready to revise the plans as circumstances dictate.

Figure 1: West African countries members of the network⁵



Objectives

First and foremost, it is the objectives of this project to establish a West African network on research in environmental change, building on existing bilateral collaboration links. It will also be the objectives of the project to develop research capacity among the partners involved through joint research activities on key aspects of environmental change. A key objective of the project will be to train young scientists from the African partner institutions in novel approaches and techniques for studying environmental change, eg. the use of Earth Observation techniques and GIS. Also, the project will establish/upgrade facilities allowing the partner institutions to utilize these techniques efficiently.

The main indicator of success of this network will be the establishment of a well managed international research program carried out by strong scientists working together on major environmental issues across West Africa.

What could be the main issues of the Network?

⁵ Not all the countries was present during the Dakar workshop in August 2005.

The first step of the network is to identify and validate the thematic issues that the group would address as a starting point. The environmental issues to be considered will fulfill various requirements such as their impacts on peoples's life, their relevance on improved natural resource management, their importance in enhanced decision making process. The network should therefore serves as a monitoring system for various needs such as early warning, archiving and modelling and capacity building. Actions to be taken should be realistic and targets clearly identified.

West Africa is a geographical space with strong north south variability associated with a climate and vegetation cover gradient. This diversity is favourable for diagnostics and prognostics on issues such as climate change impacts on ecosystems and livelihoods. The high demographic growth and progressive scarcity of resources require a closer look to land use change and land cover degradation factors.

The Workshop held at Dakar in the summer 2005 shows several research directions, including broad aspects on water issues, vegetation change, pollution, tools and methods, soil fertility and agriculture, rainfall studies, climate change, etc. The workshop aimed at identifying the needs and the sites where research could be carried out. This choice must be driven by the scientific interest and the political relevance.

To kick the network, two main thematic aspects are proposed for this action plan : **Land use, Land Cover** and **Bushfires**. These two issues are known to be transversal and they are studied in several institutions, have global linkages and have a meaningful impact on people's livelihoods. The Land use Land Cover group should be tightly linked with international initiatives such as the GOF-C-GOLD (<http://www.gofc-gold.uni-jena.de>), Africover (www.africover.org) and other relevant projects working in Africa through a large international scientific committee. The West African Land Use/Land Cover focus group will work with close links with the MIOMBO initiative in South Africa (www.geog.psu.edu/geclab/miombo/). As for the bush fires the main international links are via the Global Fire Management Center (<http://www.fire.uni-freiburg.de/>) and the Department of Geography, University of Maryland (<http://www.geog.umd.edu/>), the Regional Sub Sahara Wildland Fire Network (Afrifirenet). GlobalNetworks/Africa/Afrifirenet.html). The fire focus group could be inspired from the SAFNET (<http://safnet.umd.edu/>). The set up could be very similar to SAFNET to foster an easy exchange and links with the South African Network.

Land use, Land Cover (LULC)

This research option covers a corner stone of the state and dynamics of African landscape. West Africa is known for its rapid vegetation degradation and soil impoverishment. Several causes of land degradation have been previously identified such as rainfall decline and various human factors such as slash and burn agriculture and wood fuel extraction. Strategies to mitigate land cover changes and track land use changes are not very efficient because of missing tools and assets to better understand the driving factors that these changes. Also, the wide range of impacts is not systematically studied and ranked. The social and economic impacts, biodiversity reduction, impact on regional scales (climate, production) versus local gain or loss could be pathways to explore various scales of perception and assessment of the land dynamics issue. All these aspects require an integrated approach only possible through a well established and organized network to raise concern and interest of various stakeholders and mobilize required resources (capacities) to better address land degradation.

The aims of the Network will be therefore, to develop a better understanding of how land use and land-use change in West African ecosystem affect land cover and associated ecosystem processes; what impact these changes are having on peoples' livelihoods and rural economy; what contribution these changes are making to global change; and how global change in turn could affect land-use dynamics and ecosystem structure and function. These aims are in line with the objectives of the IGBP, IPCC, GOF-C-GOLD and the Kyoto Protocol and are similar to some extent to the MIOMBO network orientation.

The objectives of the sub-group on LULC could be stated as follow:

- develop a fundamental understanding of the causes and rates of land cover changes in relation to land use patterns and natural triggers such as drought;
- predict the consequences of land use/land cover change, on regional climate, natural resources, water resources, carbon uptake and losses;
- develop a predictive understand of patterns and rates of land use change and consequences for ecosystem goods and services;
- understand overall vulnerability of people's dependance on natural ecosystems to environmental changes, including climate change, biodiversity loss and land degradation;
- develop strategies for better sharing and communication of research results to feed the decision making process;
- participate in LULC models and anticipate possible trends of LULC changes.

Bushfires

Vegetation burning has been clearly recognized as a serious problem in West African natural resources state and management. This area of the world has been flagged since memoria as an endemic zone of bushfires. Several characteristics lead to this situation. First, West Africa is dominated by savanna ecosystems with a continuous grass layer that dries out every onset of the dry season giving large areas prone to rapid and drastic fire spread. Second, the use of fire in daily human activities is fully imbedded in local livelihoods because of the lack of advanced technologies, that are out of reach for low income people. Third, social and cultural meaning of fire in African societies underpin strong link between fire and various aspects of social life (believes, perceptions). This range of considerations explains why fire is a widespread and transversal issue that should be adressed within a network for a better interdisciplinary approach to cover the wide range of issues related to burning.

The main objective of the bushfire sub-group is to achieve more effective and appropriate fire management policy practices in West Africa - through the use of Remote Sensing/GIS and other geospatial information technology. More specifically, the Fire sub network will seek at enhancing the use of validated remote sensing and geo-spatial information in West Africa through the following aspects and supplement the SAFNET initiative. In more detail, the fire group will:

- increase information on fire issues through research and raise public awareness as well as policy makers on issues of fire and the value of geo-spatial information in fire control;
- methods development for early warning system to anticipate fire occurrence in fire prone areas;
- promote a forum for informed communication on fire related issues within the region.

- communicate regional fire needs at national and international level;
- collect and disseminate regional fire information, data and best practices for field observations;
- develop and maintain links to existing fire and other appropriate networks such as SAFNET;
- enhance the use of validated remote sensing and geo-spatial information in Western Africa;
- gather relevant information associated with fires for models of global change and their regional impacts.

Methods, approaches and scales to be used to achieve the Network goals should be proposed by the different working groups.

Approach of the network

The approach of the Network to address these issues are:

- 1) **Interdisciplinary workgroups** (diversification of disciplines and interactions): In the two research groups we will have several sub-groups carrying various aspects of the main issue. For instance, the Land use group should have a mapping and change detection team, a human dimension team, a carbon dynamics team etc. The fire group may have a fire detection team, a fire readiness team, a data base and dissemination team, etc.
- 2) **Sharing of tools and data** (tentatively a set up of a data gateway): A performant network is based on a dynamic sharing process. As data and tools could not be balanced within west African countries, it is proposed to set up a platform of exchange via internet, FTP. This could be supported by the structures such as the Clearinghouse Mechanism or the GSDI (Global Spatial Data Infrastructure).
- 3) **Organisation of workshops**: The scientific meetings will be a great momentum for the network and would lead to direct interactions between researchers, validation of products and papers, and debate on critical issues. The workshops will be held rotatively in various countries.
- 4) **Editing and publishing reasearch results**: The network will try to publish as much as possible the research results. The publication could be in different forms, journal papers, books, proceedings, CD's, etc. All the publications will be posted in the web page of the Network.
- 5) **Web page and enews**: The web page and data gateway could play an important role in permanent scientific junction between members. The enews will be generated from the secretariat of the network and will include monthly bulletins on the most important information of the network, including workshop venues, state of progress, achievements and relevant news from other similar networks.
- 6) **Training and share of competences**: As skills and specialities are very different in West African universities, it is proposed to organise during the network life a series of training sessions on specific technical issues. These training could be held in different countries, inviting the international expertise and mobilizing african scientists to participate. An example of training could be on fund raising, or the use of MODIS fire

products for national fire forecasts, etc. In the same context, students (Master's, PhD candidates) could, via the network visit various laboratories to improve their capacities in relation to their research area.

Where are we now?

What are the West African achievements and progress in joint efforts to address the scientific environmental problems on the sub region? It is important to evaluate our current sub regional/ organizational strengths and weaknesses.

Universities in West Africa have been attempting to develop strong linkages following some sub regional political cooperation schemes (CILSS, CENSAD, ECOWAS, NEPAD). The last ten years are known to be very productive in joint project implementations, as requested by the international donors for transboundary task forces to work on transversal issues. The African specialists are forced to work together for a better and more input in regional and global environmental problems.

Several networks have been set up through the AUF (Agence Universitaire de la Francophonie), The ABAO (Association des Botanistes de l'Afrique de l'Ouest), PRCM (Programme de Conservation des Ressources Marines et Côtieres), FRAO (Fondation Rurale de l'Afrique de l'Ouest), WANMAT II (West Africa Network II for Monitoring Antimalarial Treatment). Few of these networks are science oriented. Therefore, through the START (SysTem for Analysis, Research and Training) program, the University Cheikh Anta Diop of Dakar-Senegal has recently organized, together with The Center of Global Change and Earth Observation, a meeting gathering almost all West African Universities to set the basis for a network on Remote Sensing and GIS. This meeting held from 17-19 august 2005 aims at identifying driving factors of major environment dynamics from a questionnaire, with a particular emphasis on the degradation of forest resources and biodiversity and some other aspects such as water resources, erosion, pollution, etc., in the context of global change. The proposed name of the new network could be **WARN** "West African Remote sensing/GIS Network"⁶.

To better set up the key lines of the network, it has been proposed to send another questionnaire to the extended list of partners to better define the details of the main aspects covering LULC and Bush fires.

What resources are available?

The network will work only if we have a full commitment from Universities. In West Africa there is a strong list of faculties working on Remote Sensing and GIS. In Senegal we have the LERG (Laboratoire d'Enseignement et de Recherche en Géomatique) who created in a joint venture framework between the National Met Service, the IRD (Institut de Recherche pour le Développement, France), the ISRA (Institut de Recherche Agricole) and UCAD (University Cheikh Anta Diop). This laboratory is carrying out several projects in remote sensing and GIS and participate in full curriculum on these techniques. In Cote d'Ivoire we have the CURAT, which is functioning as a training center for GIS. The same type of structure is found in

⁶ The french translation WARN could be tricky, but we propose here the acronym **ROAT** (Réseau Ouest Africain de Télédétection).

Nigeria with the RECTAS. Moreover, West Africa has a set of big operational centers such as AGRHYMET (Niger), CSE (Senegal), ACMAD (Niger). The research carried out in these institutions, shows a tight link with the two main issues of the network.

For the human resources , West African Universities count number of specialits in GIS and RS application that could be integrated to carry out big projects. Nevertheless, an enhancement of research capacities is needed to improve some skills and approaches to dig more in to the main issues of the network. In addition we need to fill the gap of the weak capacities of the technical personel to support field surveys and laboratory work.

The faculty staff will be supplemented by a bunch of students from different departments (geography, botany, agriculture, rural development, etc.) and by technicians from public services.

In financial terms, while individual researches or small groups are succeeding to get funded, the network should develop capacities for fund raising, there is a need for a higher budget to better focus on the proposed thematic aspects. These financial supports are enabling West African scientists to have new and high end equipements and cover field visists and student expenses.

West Africa is very dependent on Developed countries for satellite data acquisition. As environmental monitoring and studies stem from good spatial coverage of our countries, we need to develop strategies for easy data acquisition. Our partnership with MSU and other partners should be a good pathway to fill the data gap problem.

The particular challenges the network may face are, therefore, capacity building, fund raising and joint work package set up as requested by an efficient networking framework.

Where do we want to be?

The objectives of the network are twofold: 1) set up a framework for integrated approaches to address environmental changes; 2) improve South-South and Nord-South scientific exchange and supplement the set of networks existing in Africa.

These two objectives should enable african scientists to better participate in information raising for a better decision making process within a joint commitment framework. The rationale of the network will be to participate in the effectiveness of the overall development goals of our countries which are facing big challenges of information gaps that couldn't be addressed with sectorial and individual initiatives. In parallel, several classic limitations for research development are being overcome with the introduction of new technologies such as computers, internet, satellite data, analytical tools. Therefore, the main gap remaining is to improve and organise the research around main scientific core groups from different countries, with a strong link with the development services, the NGOs and other stakeholders.

The main indicator of success of this network would be a well managed research program carried by strong scientists working together on main environmental issues in West Africa. Beyond the national interest of differents countries, the network could help some regional and sub-regional initiatives such as NEPAD, CILSS, ECOWAS, etc.

It is possible to foresee some possible budget limitations to carry out the research activities. The network leaders should take into their agenda the requirement of fund raising to support the stream of actions. On another hand, we will need an efficient communication strategy to better link the network to the decision making process. The UNDP and the MIOMBO-SAFNET collaboration showed the usefulness for such a junction.

Studies of bush fires, causes and consequences of land-use and land-cover changes in natural ecosystems and urban areas are intended to be undertaken by a consortium of participating institutions and individuals, drawn primarily from within the region (Figure 2), at a network of sites to be located in different land-use patterns and a variety of ecosystems within West Africa. The **key questions** underpinning the research agenda of the network are as follows.

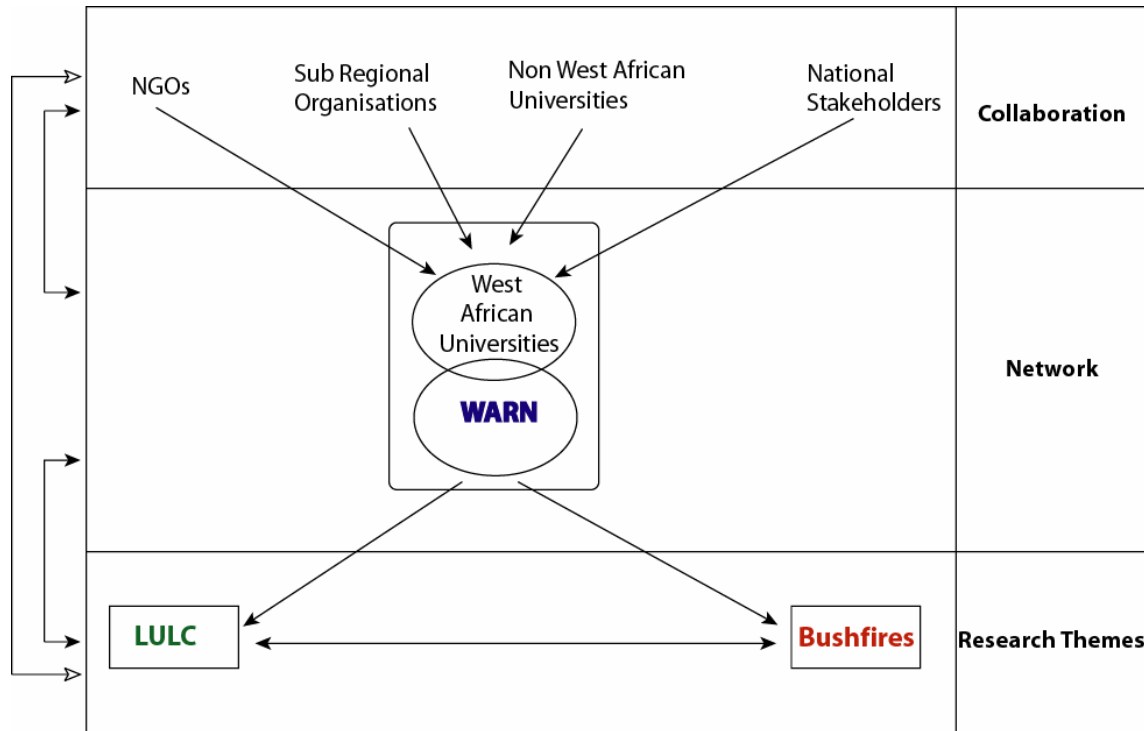
For Land Use/Land cover:

- What are the current directions and rates of change in land use and land cover in different parts of the region, and what is driving these changes?
- What are the consequences of land-use and land-cover change for regional climate, hydrology, carbon storage, urban areas development, trace-gas emissions, and natural resource availability?
- What controls the distribution of plant species and ecosystems?
- What controls primary production in natural ecosystems?

For Bush fires:

- Where are the bush fires?
- When do the bush fire occur?
- Who is burning the bush and for what purpose?
- What are the physical and human impacts of burning?
- What are possible solutions to mitigate the use of bush fires?

Figure 2: Structure and fonctional links of the network (WARN)



WARN: West African Remote Sensing/GIS Network
 LULC: Land Use, Land Cover

The West African Remote Sensing/GIS Network will be constituted by West African Universities. But it does not mean that we will select just one university per country. WARN could include several research institutions in the same country. Inversely, we could have no institutions from a given country depending to the level of commitment and interest of potential partners. This explains why in Figure 2, the WARN and West African Universities are not merged together.

For the functioning of the network we need to validate the thematic choices, define terminals, adopt a modus operandi for membership and responsibility sharing. The SEARIN (Southeast Asia Regional Network) has a structure that could adapted for the WARN.

HOW DO WE GET THERE?

There is a requirement to define clearly the steps we will take to reach the goals identified for the network. The main strategy proposed to achieve the goals, and the break down of this strategy to smaller discreet steps will help define a road map for the network.

Objectives	Action	Priority
Identification of National Focal points and network secretariat	Revisit the list of participants and propose the core group of the network	Commitment of partners and designation of country contact
Design the structure of the network	See proposition in this document (figure 2)	Organigram setup, constitution of the two thematic groups, mandate of the network secretariat and group sessions
Update the inventory on scientific issues and research capacities	Send the questionnaire to the extended list	State of the art in the two thematic options, to know where we are and what step forward
Definition of starting projects for the LULC and Bushfires sub groups	Elaborate projects on bush fire monitoring and land use/cover survey	Mobilization of west african expertise on land use and bush fires studies
Define roles and responsibilities of partners	Definition of rules, responsibilities, accountabilities and custodianships of members	Workshop organisation to discuss this option and the others included in this table
Identify specific sites (or transects) for long term surveys	Identification of previous projects sites and possible pilot projects sites	Workshop, Publications

To achieve these goals we need the base our actions from lessons learned in terms of support raising both at national level (governments) and international level (donors). We need for member institutions a long term commitment.

Possible project ideas for Land Use/cover

1. Land Cover and Land Cover Change: Forest/Non-Forest Changes (Land Conversion);
2. Dynamic of urban areas to address the rapid change in big agglomerations and their impact on the environment and citizens;
3. Products to include maps of the current extent of forests and highlighting hot spots of change at 3-5 year intervals;
4. Soil Changes: Land Use and Carbon Content Products to include trajectories of carbon depletion/ buildup as a result of land management especially carbon sequestration potential under improved land management;
5. Wood Changes: for a better monitoring of afforestation and reforestation initiatives to include models of growth and carbon sequestration;
6. Woodland Changes: Forest Cover, Growth and Dynamics, and dynamic models of the vegetation development under natural and disturbed conditions including the role of fire.

Possible project ideas for bush fires

1. Training for extended use of MODIS fire product at national level to foster an operational use of satellite data for early warning and dynamic data supply to decision making;
2. Fire Impacts on ecosystems and human livelihoods to include improved information on fire distribution and extent;
3. Analysis of the impacts of bush fires on biodiversity and climate change (green house gaz from fires) to better address the relationships between burning and these global threats;
4. Fire regimes characterization in relation with land cover and land use with a strong emphasis on vegetation cover and local practices regarding the use of fire as a management tool;
5. MODIS, ATSR, fire products validation to participate in some Global initiatives on data production;
6. Bush fire policies and local strategies.

From possible actions, we can see a strong link between the group on Land use/Cover and the on in bush fires.

Conclusion

From the high expectation expressed by West African researches during the Dakar meeting, we think that this network has a great chance and possibilities to succeed. This action plan tries to set up a first basis for discussion to be supplemented progressively as new ideas come out and new situation arise. The document is inspired by existing networks schemes but wants to have its own originality regarding the practical options and its approach. Nevertheless, it aims at a strong and sustainable participation in global and regional initiatives, while producing useful information at national level to support the decision makers.

Margaret Mead said “*Never Doubt that a small group of committed people can change the world*” . We believe that commitment, willingness will be the main attitudes through which we could make operational such a network. Inspiration from other networks shows that a good network is not always a gathering of the best scientists but a the set up of the best group of scientists. This means good linkage that underpins a suitable share of work and information within an efficient communication framework.

Brief Description of Potential Partners

The GOFC-GOLD

Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD) is a coordinated international effort to ensure a continuous program of space-based and in situ forest and other land cover observations to better understand global change, to support international assessments and environmental treaties and to contribute to natural resources management. GOFC-GOLD encourages countries to increase their ability to measure and track forest and land cover dynamics by promoting and supporting participation on implementation teams and in regional networks. Through these forums, data users and providers share information to improve understanding of user requirements and product quality. GOFC-GOLD is a Panel of the Global Terrestrial Observing System (GTOS), sponsored by FAO, UNESCO, WMO, ICSU and UNEP. The GOFC-GOLD Secretariat is hosted by Canada and supported by the Canadian Space Agency and Natural Resources Canada. Other contributing agencies include NASA, ESA, START and JRC. Further information can be obtained at <http://www.fao.org/gtos/gofc-gold>

The AFRIFIRENET

In accordance with the mandate and scope of the Inter-Agency Task Force for Disaster Reduction of the UN International Strategy for Disaster Reduction (ISDR), Working Group on Wildland Fire, and in collaboration with managers, policy makers, technical experts, and scientists throughout the region and worldwide, the Regional Sub Sahara Wildland Fire Network will facilitate the enhancement of local, national and regional fire management capabilities by creating synergies of participating scientists, managers and policy makers. Particular emphasis will be given to reduce the devastating effects of wildland fires on property, resources, health, and the environment. In this work, the Regional Network will initiate processes and systems of information management and dissemination and facilitate technology transfer with the aim to help prevent and mitigate these effects. The working group will contribute to strengthen institutional fire management capabilities and to bring the world's knowledge and technical expertise to communities suffering the devastating unnatural and unwanted impacts of wildland fires. The Terms of Reference of the Regional Sub Sahara Wildland Fire Network are to establish and maintain a regional- and national-level wildland fire network for the African continent south of the Sahara, functioning within the Global Fire Management Working Programme / Network coordinated by the Global Fire Monitoring Center (GFMC) in line with the work of the UN International Strategy for Disaster Reduction (ISDR) Inter-Agency Task Force for Disaster Reduction, Working Group on Wildland Fire.

SAFNET

The Southern African Fire Network is a regional network that fosters collaborative efforts in fire monitoring and management in southern Africa. SAFNet is a Global Observation for Forest and Land Cover Dynamics (GOFC/GOLD) regional fire network and contributes to meeting the goals of the GOFC/GOLD program. SAFNet was initiated using small seed funding grants from NASA, USAID (EMIS and GISD) and START. Future collaboration with partners and funding agents is being sought. SAFNet's goal is to achieve more effective and appropriate fire management policies and practices in southern Africa through the use of remote sensing and other geospatial information technology. SAFNet's purpose is to enhance the use of information from field observations and remote sensing of fires for natural resource management in southern Africa.

The Miombo Network

The Miombo Network is an intercore project activity of the IGBP/IHDP Research Programme LUCC organised within the framework of the IGBP Terrestrial Transects studies within START's SAF region. The aims of the Network are to understand how land use is affecting land cover and associated ecosystem processes in the miombo ecosystems of Central Africa; to assess what contribution these changes are making to global change; and to predict what effects global change in turn could have on land use dynamics and ecosystem structure and function. Given the focus on land-use and land-cover change, the administrative responsibility for the Miombo Network will reside with LUCC. As such this activity has been developed in close collaboration with LUCC and utilized the LUCC Science Plan as a framework. Since changes in land use and cover affect ecosystems and other biophysical systems, the Miombo Network activity recognizes the need to incorporate ecosystem dynamics and develop links to GCTE and other Programme Elements in a truly trans-programme-element fashion.

AFRICOVER

The Africover Project developed a combined approach to promote the sustainable use of natural resources. This initiative promotes the use of remote sensing and geographic information system technologies for natural resource assessment. Based on an innovative land cover classification methodology, now adopted by FAO and UNEP as the standard land cover classification system, the project initiated a new way to store information and liberate it in a flexible way to answer user needs. Capacity building and participation have been organized on the Africover methodology and tools, national remote sensing and GIS officers selected by the national focal point institutions (NFPI) develop the country databases with the support of the Project. Special training is provided to reinforce the capacities in using and maintaining the data bases. This goes along with Spatial Data Infrastructure (SDI) compliance: standards adopted, policies for the distribution developed, maintenance and access to the data ensured and data custodianship guidelines published to assure that data will be considered a public good available to any end user interested. In the perspective of the WARN the Africover built a Partnership and Alliances for a detailed, homogeneous global land cover serving the needs of different user communities created the conditions for the launch of the FAO-UNEP Global Land Cover Initiative.

List of Institution representatives for the Network.

	Country	Name	Institution	Email address
1	Gambia	Ebraima Ceesay	NEA	nea@gamtel.gm
2	Ivory Coast	Kouadio Affian	CURAT	k_affian@yahoo.fr
3	Ivory Coast	Sekou Bamba	FEM	lefilside bamba@yahoo.fr
4	Nigeria	Massaer MBaye	RECTAS	mbayemassaer177@hotmail.com
5	Nigeria	Appolonia Okhimame	Univ. Minna	aimiosino@yahoo.com
6	Nigeria	Adeaga Olusegun	Univ. Lagos	oadeaga@yahoo.com
7	Mali	Pierre C. S. Traoré	ICRISAT	p.s..traore@cgiar.org
8	Mali	Khassoum Diéye	Institut du Sahel	dieye@agrosoc.com
9	Mali	Amidou Traoré	STPE	amtraore22@yahoo.fr
10	Togo	Dodé B. Johnson	CGILE	d.jphnson@odinafrica.net
11	Benin	Vincent J. Mama	IVC President	mamvincent@yahoo.com
12	Rep. Guinea	Koikoi Zoumanigui	IRAG Seredou	baourou@yahoo.fr
13	Niger	André Nonguierma	Agrhymet	A.nonguiermaagrhymet.ne
14	Niger	Marie Julie Menard	ICRISAT	m.menard@cgiar.org
15	Burkina Faso	André Bassole	EIS-Africa	a_bassole@hotmail.com
16	Burkina Faso	Edward Yeboah	SRI	eyeboah@hotmail.com
17	Burkina Faso	Jean Marie Dipama		jmdipama@bf.refer.org
18	Mauritania	Mohamed O Jiddou	GREZOH	
19	Mauritania	Demba Marico		dembamarico@yahoo.fr
20	Cape Verde	Eduardo Dos Reis	INIDA	areis@inida.gov.cv
21	Ghana	Emmanuel A-Otchere	CERSGIS	eamamoo@ug.edu.gh
22	Ghana	George Wiafe	Univ. Ghana	wiafeg@ug.edu.gh
23	Senegal	Amadou T. Diaw	LERG	atdiaw@ucad.sn
24	Senegal	Cheikh Mbow	LERG/ISE	cmbow@ucad.sn
25	Senegal	Souleye Wade	LTA	wadesouleye@yahoo.fr
26	Senegal	Amadou Gaye	LPAO	atgaye@ucad.sn
27	Senegal	Assize Toure	CSE	assize@cse.sn
28	Senegal	Youssou Ndong	DTGC	