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NSDI activity in Burkina Faso

Abstract

This presentation points out the problems of spatial information management in a context of under development where land use is largely conditioned on two parallel land status, that rises the question of what type of land information system to set up to improve decision making, environment upgrading, state planning and land use monitoring?

In this question in Burkina Faso, and in Africa in general, population grows so fast that struggle for land looks like a « struggle for life ».

In Burkina Faso, there is not yet an efficient cadastral system. Some experiences are ongoing but surveyors are not very involved.

Further more there are not many surveyors with high skills level and many of them don't have opportunities to update their skills so that the fast development of technology in surveying matters becomes a problem.

The profession is facing many problems about integration of data bases, because of lack of coordination between the actors and users of GIS users, existence of different geodetic references with different level of precision or of datum, so that the benefit of GIS tools to update maps and geographical information are almost lost.

Surveyors are facing also problems of fundings to ensure equipment and ongoing training.

The report points out also despite the difficulties, the new millennium can offer better perspectives to Burkina and African surveyors if they organise themselves at national and regional levels and work towards a best integration into the international scientific community of the surveyors on behalf of which FIG works.

The author, Alain Bagré, land surveyor and urban planner in Burkina Faso thinks suggest a work focussing on the particularities of land and spatial information management in this region to give opportunity to the community of surveyors to think about that complex land situation and make proposals about the key role of the surveyors.

The report notes that despite the new millennium, our profession is unequally developed in the different regions of the world and that Surveyors have to do that the new possibilities help every surveyor and the whole profession to go forward.

« We don't look and expect from the new millennium from the same place but are condemned to work together within it: a great challenge !! », is the conclusion.

**SURVEYORS AND LAND INFORMATION MANAGEMENT
IN BURKINA FASO, WHICH ROLE IN THE 3rd MILLENIUM ?**

I BRIEF PRESENTATION OF THE SITUATION

1.1 - Generalities

Burkina Faso, called before Upper Volta is an ex- french colony country, located in the heart of West Africa. It's area is 274000km². It has acceded at independence in 1960. Burkina Faso has about 12 millions inhabitants. The population grows at a rate of 2.68%. About 20 % of these people live in town. 30% of the population is educated. That means it is a rural country with a low educated population and a fast growth population land which does not extend. So, struggle for space is becoming an important question. In this «struggle» which looks like a struggle for life, security of tenure is fundamental. In this way it becomes environmental and sustainable development issue; This question can not be solved correctly without a preferment cadastre as a tool of land information management and also as a help for decision-makers. Government has the political responsibility to set up such a cadastre, but with the advice and assistance of surveyors that we are.

So also to establish a good State Master Plan without which land use for development cannot be planned.

Now the State Master Plan is being established and there is not a real cadastre system, efficient in Burkina Faso. This is dangerous for a process.

1.2 - Surveyors in Burkina

But in Burkina Faso there are not a lot of surveyors. There are less than 50 surveyors trained at bachelor level and about 250 trained technicians but at a low level.

Students at high level are 3 at school in France and Morocco.

There are 15 private companies of surveying led by engineers. The others surveyors are employed by government or private companies.

There is not a system to update technicians' skill so that new surveying technologies are not available at a large scale for surveying activities. For example, there are 6 GPS receptors in Burkina: 4 at the National Geographic Institute and 2 at regional professional school for rural technicians hosted in Ouagadougou.

Generally, use of new techniques is the fact of foreign companies within great works funded by World Bank or international cooperation.

II - STATUS OF LAND AND SPATIAL INFORMATION MANAGEMENT

In rural areas land tenure is essentially a customary occupation. Transactions about land are not written, although it is changing by the last ten years. Customary rights are not recognized by official policies and that is a problem to establish cadastral system particularly in rural areas.

Land has not the same status in town as in rural areas.

The problems of spatial information management is that technically, it should be easy now with new technologies as GPS methods of survey, computerized data record methods and survey, prodigious development of GIS tools.

But so is not for land owners and rights because they can not be computerized before they are defined and that is a problem and a responsibility for land surveyors in our countries in Africa, particularly in Burkina. How to build an efficient cadastre in our country ? That is a question now for land administration and surveyors.

Since colonization, many reforms have been tried to improve land information registration, particularly rights of owners recording, in order to secure them as a mean to make land more productive.

Despite these reforms, we have two parallel land status cohabiting: the customary one practically recognized by all and the legal which works only in plotted areas as towns and some rich valleys.

III – LAND STATUS AND TENURE SECURITY MATTER

3.1 - Evolution of land policies in Burkina Faso

Before colonization, land management and tenure were led by customary landowners based on family groups ownership. The new production mode introduced by colonialism brought needs of private property tenure and security. So a law has been acted in 1904 for the whole West Africa French colonies. Since this date, land policy has been reformed according to local economic evolution and people rededications, till independence happened in 1960. The principal steps of these reforms are as following:

- 26th July 1932 : land policy for French West African colonies
- 12th July 1960 : law n° 77 /60

These land policies recognize customary rights and were based on peaceful cohabitation with the two parallel systems.

- 4th August 1984 : previous policy abolished and promulgation of a new law : all land to Government ; old real property titles are abolished ; According to this land law, customary land ownership is not recognized.

- 4th June 1991: recognition of possibility of private property but land is always property of central government which can sell it to companies, associations and private people;

- 23th May 1996 : liberalization of land market; land policy reform and acting of a new law : law n° 14/96/ADP ;

Land policy recognizes six (6) kind of titles for land occupation:

According to the land policy, every land occupant must have one of the following titles according to land use:

- " arrêté d' affectation " for public offices' occupation and activities

- " arrêté de mise à disposition " for non economic activities as culture, church , etc ..
- " permis d' occuper" for temporary activities ; this kind of title is not permanent as the other ;
- " permis urbain d' habiter " for housing ;
- " permis d' exploiter" for industrial or commercial use;
- " bail " (Lease) for any permanent activities

These titles provide use rights to the occupant but after investment ;
All the permanent titles can be transformed into " titre foncier" to make the occupant owner of the land ; Its exists in the whole country less than 10.000 such property documents provided.

These titles can be provided in plotted areas or in other areas by a long and expensive procedure ; they are registered at a national government level;

Informal settlements are not concerned by the official titles delivery. So for lands occupied according the customary rights, in rural areas.

3.2 - Rural Lands

Rural lands are occupied by farmers through customary rights and customary transactions. So that the official rights cannot be recorded there. They are not furthermore frequent.

Now, because of the conflicts met more and more in rural areas, a recording experience of recording customary rights has been undertaken since 1998 in a center region of the country called « Ganzourgou ». This experience, already led in Cote d' Ivoire and Benin with french cooperation fundings schemes to see how to build a kind of rural cadastre based on the traditional rights that rural traditional farmers know. This kind of cadastre also seems a kind of tool to facilitate transformation of the traditional rights into legal rights recognized by the official land policies. These experiences are ongoing and it would be interesting to participate in the lessons draw out process.

Unfortunately, surveyors are not involved enough in the process. Why is the question but they have to fight to be involved. This experience is important from my view point for the community of surveyors in our developing countries even of FIG surveyors.

Most the local wars in Africa have some links with land conflicts because of the population growth. Our profession have to give tools to decisions makers according one of FIG purpose recommends us to work for the society well being.

A work shop can focus on the particularities of land and spatial information management in our region to give opportunity to the community of surveyors to think about and make proposals.

3.3- Urban Lands

Urban land tenure security problems are met also in the major cities of the country, particularly in Ouagadougou (about 1 million inhabitants) and Bobo-Dioulasso (400.000 inhabitants) for housing
By the 1980' years, large part of the major cities were occupied by informal settlements. 4th In August 1983 , new revolutionary power undertook within voluntary politics to regularize informal settlements . The operation has been led from 1983 to 1990. The new land policy acted in 1984 works only for legal town , in plotted areas ;

Rights are not recognized in informal settlements where neighbourhoods are fixed by customary landownership, because land policy don't recognize customary rights in urban areas;

We have an existence and cohabitation of two systems of land tenure : formal and informal

So that officially, it is only in towns that surveyors working in the governmental administration are trying to set up a cadastral system for urban land management.

3.4 - Wich Cadastral System to establish ? ;

It does not exist in Burkina a perfect land information system for rights registration; The legal land market represents a small part of the the land economy. There is a proactive informal market , even for the legal plots of the legal town because of the taxes and complication of rights change procedure; Within a project financed by World Bank called « urban project III », a urban information system is being set up , involving the local institutions, but only for the two major cities, Ouagadougou and Bob-Dioulasso. This system includes data base on land rights and land use in town . Its purpose is improvement of the two towns' infrastructures planning and

Efforts are being also led by central government to decentralize urban land management at local level; A land policy reform is running in this way . It will be possible by this moment to implement a land information and tenure security system at a local level and it will be a challenge for surveyors to advise and help local authorities to establish such tools efficiently.

At central government level , cadastral office is trying to set up a urban land registration system for land taxation purpose. But this system does not perform yet.

I have talked above about the experience ongoing in rural areas about traditional rights. The main thing till now we are looking for the way to establish a system which is adapted to our local context using the universal technology progress and here also is another question.: the availability and accessibility to these technologies .

In fact, out of the legal questions, surveyors in our country are facing a lot of other difficulties and problems due to a lack of coordination, many systems of geodesic infrastructure which are not integrated, lack of standards and official norms, poverty, insufficient skills, ongoing training, old fashioned equipment etc..

III- Spatial Information Management Problems

3.1 - Lack of coordination

To illustrate this situation I take the case of GIS systems using. GIS is a very efficient for spatial information management, particularly with the ongoing improvement of remote sensing image resolution. This tool is used every body for him self without coordination. So some works are done twice, three or even more times.

It is often impossible to exchange files or data because of the hard or soft ware are not compatible. Here is for example below the list the principal users of GIS:

Main GIS USERS in Burkina

N°	Institut Name	Information type -purpose	GIS Soft ware used	Setting Up Date
01	University of Ouagadougou Departement of geography	Land use and population density analyse	Arc-View; Arc-Info	
02	Rural Developpement Institut	Soils and vegetation 's evolution characteristics	Idrisi ; winchip4.2	
03	Agriculture statistics office	fields areas and crops production analysis	Ilwis; Atlas-Gis	
04	State Planning Office	Regional and State planning	Arcview; Arc-Info	
05	Animals breeding areas planning office	animal and agriculture's resources monitoring	Arc-Info; Arc-view; Ilwis; Idrisi; Mapinfo	

N°	Institut Name	Information type-Map Scale	GIS Soft ware used	Setting Up Date
06	National Institut of Statistics and demography	Population indicators analyse	Arcview; Arc-Info	1997
07	National Program of Space Management	Land Use and natural resources evolution in the concerned area of the program.	Arc-Info; arcview	1993
08	Hydraulic General Office (informatic Bureau)	Water Ressource analysis	Arc-Info; Arc-view	1990

N°	Institut Name	Information type–Map Scale	GIS Soft ware used	Setting Up Date
09	National meteorology Office	meteorology parameters analysis	Idrisi; Atlas-GIS; Arc-Info; Arc-view	
10	Nnational bureau of Soils	Soils ability and morphology analysis	Arc-view; Arc-Info 3.0	

N°	Institut Name	Information type–Map Scale	GIS Soft ware used	Setting Up Date
11	Géographic Institut of Burkina (IGB)	Geodisic infrastrucure set State basic cartography small sacales	Arc-Info; Arcview	
12	Cadastre Office	Urban Land data base Cadastral Maps digitilazation	Arc-Info; Arcview; Autocad 2000; Map-Info	1996
13	Urban statistics and data analysis Office	Urban Master plans urbanization data analysis	Map Info4.5, 5.0; Arcview 3.1; Idrisi	1994
14	Mines and geology Bureau	géologic maps mine ressources mining ressource data base implementation	Atlas-GIS; Idrisi 4 sous DOS; Autocad ; Géosoft-Aosis; Montaj 4.0 /windows	1996
15	Regional School of rural iengeniers (EIER)	Training ;Assistance	Arc-Info; Arcview; Autocad 2000; Map-Info; Atlas GIS	1999
16	Géo-Conseils(GIS Private company)	consultancies cartographic works ;	Arc-view ; Map-Info	
17	Project: “ Cartography of the forests ”			

N°	Institut Name	Information type–Map Scale	GIS Soft ware used	Setting Up Date
18	Project ENRECA/University	Vegetative state study	Idrisi	
19	IRD (french abroad research institut) office of Ouagadougou			
20	ANMERCOSA-EXPLORATION	Miniral Recherch	Arc-View 3.1; Arc-Info; Autocad	
21	CONAGES/PNGIM	coordination of spatial information systems activities		1993
22	Project : « Rural land mapping of Ganzourgou region »	Cartography and inventory of rural land rights (customer and legal)	Arc-View; Arc-Info	1998

We must note that the most of these systems or projects are finiced mainly by world bank and internatioanl cooperation funds .

We can note also that private surveyors companies are not listed . Because they are not well equiped as well they are beginning to. They use generally Autocad for maps drawing.

4.1 - Non integreted informations

Acording to the period , the Institution whichc produces or even the region in the country survey is not bsaed on the geodetic reference:

An official network of points have been established in 1997 with the help of switzerlznd surveying office and EPF of Lausanne , but has not densified enough to cover all the state. Every surveyor can not have a double frequence GPS receptors.

Here are below the different systems which are been set up for cartograhya, urban land plotting and management or scientific purpose.

Geodetic Infrastructure

1 – Astronomic network of points

Year: 1950

Implementation of 200 astronomic points

Area : Whole State and all west africa french speaking countries within west-africa maps confection by IGN of france

Ellipsoï d: Clarke 1880

Precision : 50m about

Projection : UTM Fuseaux 30 and 31

2 – Triangulation of Ouagadougou area

Year : 1958

Implementation and computing of 54 geodetic points by classic method by IGN France

Area : 9500ha around Ouagadougou

Ellipsoï d : clarke 1880

Précision : 9 cm

Projection : UTM fuseau 30

3 - Points along 12th parallel

Year : 1960

Purpose : Implantation , survey and computing of 46 points for scientific purpose by US army

Area: Line of the 12th parallel trough all the africa continent.

Ellipsoï d : clarke 1880

Précision : 10 - 20cm

Projection : UTM fuseaux 30 et 31

Datum : ADINDAN

Realised by : I G N-France

Commanded by : U S A and France

4- Doppler Network points

Year : 1979

Purpose : Implantation , survey and computing of 16 points by Doppler method within african geodetic network project

Area:All the the country.

Ellipsoïds : Definition and survey by Doppler on WGS 72 and computing final results on clarke 1880

Précision : about 5 m

Projection : UTM fuseaux 30 et 31

Datum : 1958 Network points of Ouagadougou

Realised by : University of Delft (Holland)

Commanded by : Geodetic International Association`s Commission for geodetic in Africa

5 - Official geodesic network
(GPS points)

1st Order

Year : 1997

Implementation of 55 points with GPS method at the first level

Purpose : To cover the whole state of Burkina by an homogenous geodetic system

Ellipsoïds :WGS 84 ,GRS 80 , clarke 1880

Précision : 7 - 10cm

Projection :UTM fuseaux 30 et 31

Realised by : Institut Géographique du Burkina and switzerland coopération

Since 1998, this first network has been densified by 217 points with precision of about 15 cm but only on the South-West part of the state.

With such a number of systems used at the same time it is difficult to have all the benefit of the GIS tools which should allow us to put a lot of spatial information together for analysis or use other survey tools for maps updating.

This problem can be solved if there adequate policy and norms.

4.2 - Policy Problems

No policy obliges surveyors and GIS users to work basically with the same geodesic system. The National Institut of cartography(IGB) is now writing a proposal in order to make a policy by government about the official geodesic system and to obliges surveyors and spatial information producers to use it. That means also that that policy will commit government and IGB to put money and efforts to cover the whole state

4.3 - Problem of fundings

In our countries everything is a priority, so that some state equipment as geodetic network are often dismissed . That is why generally, this kind of work are supported by external fundings. Authorities do not always understand the importance of funding some activities to develop the profession.

Surveyors have to organise themselves to make authorities understand that it is investments which are benefit for the country. In this way, the support of the community of surveyors can be very helpful. Surveyors themselves have not money enough for the promotion of their profession, for acquisition of new and performing equipment. Nevertheless they must make more efforts and sacrifices to make the profession attractive for the young people.

4.4 - Problem of skills and competence maintenance and up-dating

Technology in the world and also in our profession is developing so fast that most of us surveyors in Burkina have to make efforts to upgrade our skills.

Many don't know to use GPS, automatised technics of surveying. The lack of fundings is one the difficulties which does not allow surveyors companies or institutions to provide modern equipment and pay for training of the employees.

Another difficulty is the fact that the specialised schools when they are known, are in Europe, America or so far that practically it is not possible to have such necessary up dating course.

Integration in international scientific community of the surveyors is become not only a necessity, but also an obligation to overcome this difficulty.

VI - Which Perspectives for the 3rd millenium ?

After such comments of the situation in a young country where every thing is to be build in the future, that means where there should and will be job for surveyors, it could seem that the situation is dark . But no, if surveyors understand their key role in spatial information management, particularly in Burkina Faso in the setting up of an efficient Land information Management. But to achieve this goal they do make efforts for :

1 °) Organization of Surveying profession and Organization of surveyors to develop it and make it more attractive for young people:

- at a national level

- at a regional level

2°) Best Integration in The International Community of Surveyors to get their support, help to learn the experience of colleagues and to create conditions of improve their skills.

It is true that language barrier is an obstacle some times but experience shows that we can overcome it with a bit of effort.

CONCLUSION

This presentation itself is a beginning and an opportunity given by FIG to improve the understanding and the solidarity between surveyors in order to take in account the fact that despite the new millenium, our profession is unequally developed in the different regions of the world and we have to do that the new possibilities help every surveyor and the whole profession to go forward .

« We don't look and expect from the new millenium from the same place but are condemned to work together within it: a great challenge!! »