IT and GEODATA for AGRICULTURE and WATER

FINAL Report ; REGIONAL CONFERENCE GEODATA for AGRICULTURE and WATER

Ouagadougou, 17and 18 April 2019

CILSS

CEDEAO ECOWAS

UEMOA

Ministry of Foreign Affairs of the Netherlands

G4AW
GEODATA FOR AGRICULTURE AND WATER

Netherlands Space Office

Netherlands Enterprise Agency

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1. CONTEXT

In the Sahel region, climate variability has increased in recent years with incidences of extreme drought, more erratic rainfall patterns, large floods resulting in less predictable growth and harvest seasons, and an impact on the conflicts between those using natural resources (water and land). As a result, climate-smart agriculture interventions are crucial in the Sahel.

In addition, the Sahel region is facing a growing population of unemployed young people. The role of technology could make agriculture more attractive to young Africans, a generation that plays a key role in achieving the sustainable development of the African continent. Information and communication technology (ICT) can play a vital role in transforming agriculture into a rewarding and profitable sector.

For this reason, in partnership with the Dutch Ministry of Foreign Affairs (MoFA), under the auspices of the Economic Community of West African States (ECOWAS) and the West African Economic and Monetary Union (UEMOA) and under the dual sponsorship of the Minister of Agriculture and Hydro-Agricultural Infrastructure and Burkina Faso's Minister for the Development of the Digital Economy and Post, the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS), the Netherlands Space Office (NSO) and the Netherlands Enterprise Agency (RVO) organised a regional conference on 17 and 18 April 2019 in Ouagadougou (Burkina Faso) to address these important issues.
The theme of this conference was:

"IT and geospatial data services in the field of climate-smart agriculture (CSA)[1]: Digital technology to increase business opportunities and entrepreneurship among young people and women in the Sahel."

Using recent experience, in particular from the Netherlands Space Office's (NSO) G4AW programme, funded by the Dutch Ministry of Foreign Affairs/International Cooperation Directorate, the meeting sought to explore how IT and geospatial data services can help meet the main development challenges facing the Sahel countries, especially in the climate-smart agriculture sector, and increase business opportunities and entrepreneurship among young people and women.

The event aimed to bring together innovative players and solutions in a dynamic process that promotes targeted knowledge-sharing, interaction, exchanges and networking to produce tangible results!

The expected results of the conference were:

- Enabling knowledge-sharing: by becoming familiar with the potential of using geospatial data and ICT solutions, to support the sustainable development of agriculture, improved water and soil management, and to ensure food security in the face of climate change;
- Creating networks of decision-makers and actors from different sectors;
- Contributing to the advocacy and acceleration of business opportunities and job opportunities through digital solutions;
- Identifying and implementing job opportunities for young people and women;
- Raising awareness of policies for decision-making.

[1] *Climate-Smart Agriculture is an approach that identifies the steps needed to transform and reorient agricultural systems (agriculture, livestock, forestry and fisheries) with the aim of effectively supporting the development of agriculture and ensuring food security in the face of climate change (source FAO).*

About 150 participants from public and private institutions and the ICT, water, agriculture, environment, climate change and geospatial sectors took part in the conference. Technicians and business leaders, donors and politicians mainly from the sub-region (Burkina Faso, Mali, Niger, Chad, Mauritania, Senegal, Benin, Ivory Coast) and Europe met during these two days. About 20% of the participants were women and 20% were young people (under 35). The conference was conducted in French with simultaneous translation into English.

This document is the summary report of the conference's various activities.

2. OVERALL PROGRESS OF THE CONFERENCE

The conference featured official speeches, plenary presentations to introduce participants to specific themes and/or recent developments, and breakout sessions to discuss these topics and/or new initiatives.

In particular, the groups on Wednesday, 17 April 2019 helped promote participants' exposure to recent experiences using ICT and geospatial data and exchanging knowledge. Five themes had been identified (particularly around G4AW projects), namely financial services and index insurance for producers, agripreneurs and ICT services, possible business models, the role of aggregators and the conditions for successful partnerships. The participants had the opportunity to register to participate in two of these groups, so for two proposed themes, one before the break and the other after.

The groups on Thursday, 18 April 2019 allowed participants to learn about regional programmes and initiatives for which their resources (knowledge, experience, skills, network, finances) could be useful and valued. Five initiatives were presented: Sahel Data Initiative (Akvo), Programme for Using Geospatial Data and ICT for Irrigation and Pastoralism in the Sahel (CILSS), Project to Use Geospatial Data for Water Management (Blue Deal), Open Data Coalition for West Africa (GODAN) and Awareness of Opportunities and Barriers Faced by Sahel Farmers (RVO).

Finally, a High Level Panel was held on Thursday afternoon on the theme: "How can digitalisation contribute to transforming agriculture in the Sahel?"
This panel brought together different actors (ministers' advisers, representatives of ECOWAS and CILSS, civil society actors), young and old, men and women active in various sectors of development (agriculture and ICT), to contribute to this discussion and increase awareness of decision makers.

The conclusions of the conference were presented before the official closing speech.

3. SUMMARY OF THE SESSIONS

3.1 OFFICIAL OPENING SPEECH

For the Deputy Executive Secretary of CILSS, Ibrahim Lumumba Idi-Issa, *"the importance given to this regional meeting is justified by the increasingly urgent need to cope with the increasing effects of climatic variability on the living conditions of people and ecosystems".*

Explaining the value of this meeting, he recalled CILSS' vision in the service of the Sahel and West Africa, which is to *"transform the Sahel into a region of excellence through implementing sustainable development and climate change adaptation policies"*.

Speaking on behalf of ECOWAS and UEMOA, Alain Traoré (Director of Agriculture and Rural Development at ECOWAS) said that *"ICT is an essential component in developing agricultural value chains which are particularly important for employment, and also in the sense of young people's employability in agriculture and for agrifood chains"*. He asserted that the two sub-regional organisations attached great value to the results of the conference's work, and that they would ensure their full implementation for the benefit of the 350 million people in the West African community.

The Dutch Embassy representative in Ouagadougou, Maarten Rusch, *noted the common desire to* promote satellite data and modern technologies to develop agriculture facing climate change. *"ICT has clearly become an important lever for economic growth, value creation and social transformation. This conference is an ideal and conducive forum to again discuss the digital issue and the salient trends"*.

According to its representative, the Netherlands wishes to help the Sahel countries fight against security threats, manage migratory flows and prevent instability, that is, to invest in poverty reduction, good governance and the rule of law, in order to improve living conditions for the people of the Sahel.

An intermezzo was prepared by the Burkina Faso slammer Minougou Nathanel (known as Nael Melerd) on the theme of the conference, entitled: *The Grandson and the Old Woman*. In a very poetic way, his text explained how Man (the grandson) forgot to use information and communication techniques (a magic wand) to help Agriculture (the old woman).

The grandson and the old woman (Slam)

Grandson (Man) and his magic wand (Technology)
should take good care of the sick old woman
(Agriculture)

because the day this old woman dies,
The day we bury her,
Grandson and his magic wand will follow the next day.

Slam written for the conference
by the burkinabé artist Nael Melerd

Alassane Guiré, Secretary General of the Ministry of Agriculture and Hydraulics Infrsatructure of Burkina Faso, representative of the coordinating minister of CILSS, was in charge of delivering the opening speech. For him, there is no need to be reminded of the essential role of agriculture in the economic and social development of the countries in the sub-region. In his view, this conference shows the great need for the Sahel and West Africa to be part of an integrated approach to so-called smart agriculture, adapted to climate change.

In his speech, Alassane Guiré announced that the certification process for seeds in Burkina Faso has been digitised, allowing producers to have them in good time. *"Very soon, the agricultural sector in our country will have a geospatial information system, as part of the implementation of the E-Burkina project. This tool will make it easier to access industry data openly and meet multiple needs, thanks to a data warehouse,"* he said.

3.2 PLENARY SESSION (DAY 1)

This first plenary was intended to present the general framework of the conference. Three presentations were made.

The first presentation on **the Challenges of Geospatial Data Opportunities for Water and Agriculture** was made by Mariska Lammers from the Department of Food Safety at the Dutch Ministry of Foreign Affairs and for the Netherlands Space Office, who is responsible for the programme G4AW - Geodata for Agriculture and Water. It aimed to show how geospatial data has contributed to improving agricultural production and smallholder incomes through environmentally sustainable land use in the context of public-private partnerships (PPPs). The main results of 23 ongoing and/or completed G4AW projects in 14 countries were presented. In particular, these results show how important it is for this geospatial data to be used to support producer-driven agricultural production and provide sustainable services.

Following the presentation, the question and answer session focused on the advantage of geospatial data in improving agricultural production and especially in increasing producers' incomes. The quality of the data and associated services was addressed, as well as the readability of this data for producers and financing its acquisition to develop a sustainable economic model. Very close public-private partnerships are needed to meet the specific needs of this data's users

Learn more: https://g4aw.spaceoffice.nl/en/

The second presentation, made by Ludovic Pascal Conditamdé, IFAD representative, aimed to introduce a new tool, the **Investment Fund for Agricultural Entrepreneurship (ABC Fund)**, launched recently. This ABC Fund, which aims to improve the livelihoods of small farmers and rural communities by addressing financing gaps at the local level, aims to provide funds to financial intermediaries eligible for on-lending, and direct financing to SMEs in the agribusiness sector and producer organisations.

Learn more: https://www.ifad.org/fr/web/latest/news-detail/asset/41022697

Finally, the last presentation was made by Béatrice Gakuba, director of the **African Women Agribusiness Network (AWAN)**, an illustrative case of how digitalisation can be a growth driver for women and young people in the agricultural sector through the example of this network. This presentation, which shares experiences, made it possible to highlight the benefit of digitised data in integrating women, who represent 60% of the agricultural production force in Africa, into the value chains, in order to improve their incomes and lift them out of poverty.

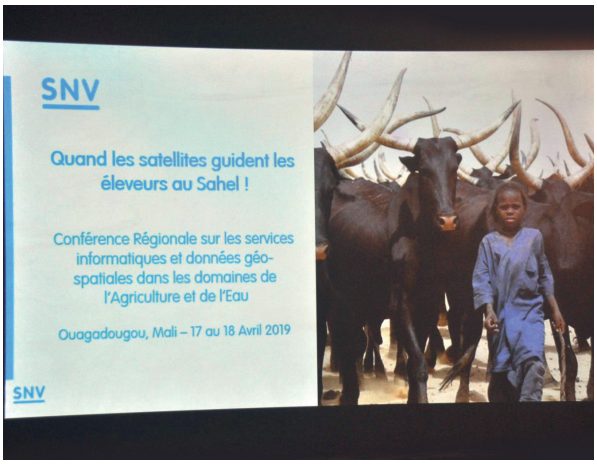
The experience of AWAN-Africa shows that there are enormous opportunities for young people and especially women to be included in agricultural value chains. Digitising information and using platforms to access markets helps reduce gender inequality and lift the most vulnerable out of poverty.

Learn more: https://www.awanafrica.com

3.3 PRESENTATION OF FLAGSHIP PROJECTS

This second part of the plenary aimed to share illustrative cases of positive experiences in the field of using ICT and geospatial data for Agriculture and Water.

3.3.1 STAMP/MODHEM



The first illustrative case was the presentation given by Catherine Lecôme from the SNV: *When satellites guide pastoralists in the Sahel*. Two projects illustrated the relevance of using ICT and geospatial data to make efficient production system choices in a low-resource environment. These are the STAMP project implemented in Mali and the MODHEM project in Burkina Faso (G4AW projects), with the objective of improving pastoralists' resilience to extreme weather events, as well as their food security, through improved access and increased usage of satellite data. This data is intended to provide information on the availability and quality of biomass and surface water as well as the concentration levels of herds and the prices of cereals and livestock in the markets, from anywhere. The economic models for providing services from this data provide lessons for the private sector.

Learn more: https://g4aw.spaceoffice.nl/en/projects/g4aw-projects/80/sustainable-technology-adaptation-for-mali-s-pastoralists-stamp-.html
https://g4aw.spaceoffice.nl/en/projects/g4aw-projects/79/mobile-data-for-moving-herd-management-and-better-incomes-modhem-.html

3.3.2 SERVIR PROGRAMME

The second presentation was made by Nouhou Kousscha Mariama and Paul Bartel from the SERVIR West Africa Programme, which is part of a consortium of geospatialised information production centres to respond precisely to the needs arising from use at community level. Hosted at the CILSS AGRHYMET Centre in Niamey, Niger, this programme uses an innovative methodology aimed at building the entire strategy for producing spatial information with the sole aim of meeting basic development needs, in order to contribute to building the resilience capacities of people in West Africa. This SERVIR programme also presented its gender strategy aimed at generating vocations for young women in the field of technical sciences.

Learn more: http://servir.cilss.int/en/

3.4 SHOWCASING SESSIONS

The purpose of these sessions was to expose participants to different themes, drawing particularly on the examples of some G4AW projects and others. In particular, participants were invited to participate successively in two sessions of their choice out of the five proposed.

3.4.1 Geospatial data and index insurance for producers (G4AW-SUM project)

This session was organised by EARS, which first presented the SUM project and its results. As a conclusion to the discussions, it can be said that index insurance is a tool to help farmers become resilient to climate hazards. However, it is essential that they have access to finance, input, etc. It is necessary to develop partnerships between the different actors in the field. It is also critical to strengthen producers' capacities so they have a better understanding of the benefits they may derive from subscribing to index insurance. States should engage in the process to make agriculture resilient through tools such as index insurance (for example: providing subsidies to cover registration costs).

Learn more about the project: https://g4aw.spaceoffice.nl/en/projects/g4aw-projects/62/scaling-up-micro-insurance-in-africa-sum-africa-.html

3.4.2 Services based on geospatial data: are they commercially viable? (G4AW-MUIIS project)

This session was organised by the CTA. The implementation of the project was based on providing satellite information services and field data for weather warnings, crop management and agronomic advice, and access to financial services including insurance services.

The main conclusions of the session are:

- ICT services and geospatial data play an important role and are a key factor in changing behaviour and developing the agricultural sector;
- It is possible to create jobs for young people by selling local and sustainable services for the benefit of the rural population;

The economic model used is not (yet) viable. However, recommendations can be made to improve it:

- Develop local language services to transmit information (resilient good practices, agricultural techniques);
- Raise awareness among actors at all levels and choose producers (champions) who totally adhere to the model for its extension;
- Have more time in the project to create services and make them profitable (consider a longer grant period);
- Establish a network of agents that will complement the contributions from technology and support service users;
- Process data to make it a source of information in developing a sustainable economic model.

Learn more about the project: https://g4aw.spaceoffice.nl/en/projects/g4aw-projects/71/market-led-user-owned-ict4ag-enabled-information-service-muiis-.html

3.4.3 Which economic models for ICT services and geospatial data?

This session organised by NSO and Waterwatch Cooperative aimed to share experiences on setting up and operating the economic model of an Agri-Coach application currently functioning in Burundi. The purpose of this application is to provide small producers with useful, accurate and real-time agricultural information to guide them towards profitable agricultural production choices that increase their incomes.

Discussions focused on the following:

- the limits in the quality of some data provided by the producers for digitising the production zones produced by the Agri-Coach application.
- The benefit for the participants in scaling up this model in the West African region, principally in the cotton regions where the producers' levels of organisation can contribute to the proper functioning of the proposed economic model.
- The profitability of the Agri-Coach economic model, the setup of which requires a significant external subsidy for at least 3 years before seeing profitability, thus confirming its social vocation.

Learn more about the project: https://g4aw.spaceoffice.nl/en/projects/g4aw-projects/88/good-agricultural-practices-for-all-gap4a-.html

3.4.4 What role for aggregators?

The session organised by Viamo allowed participants to understand what aggregators are, their roles and how they work. For example, an aggregator is an application, software, or organisation that collects multiple sources of data or information, (potentially) processes it and redistributes it. Several speakers shared their experiences. This session addressed the following topics:

Should services related to the provision of data/information by aggregators be free? What is the sustainability and longevity of the services offered by aggregators?
If agricultural information/data/knowledge is considered an input in the same way as water, seeds and fertilisers, we should work on changing attitudes to consider its value. Therefore, services should be accessible and paid according to the actors' level of need. Services should be paid to make the systems/aggregators sustainable and autonomous.

Data quality/reliability of information provided
The participants emphasised the quality of the data to be disseminated to actors. This data can influence the actions and commitments undertaken between different actors. Particular attention should therefore be paid to verifying the quality of the data/information before it is disseminated. This is true for aggregators of all types, including agricultural awareness agents or agricultural product distributors.

The capacity/competence of local organisations to become aggregators
Is there room for local organisations in West Africa to play the role of aggregators? This was seen as highly necessary in order to take over responsibility and also to reach the rural populations with whom these organisations work. The main difficulty for these organisations is how to connect with existing aggregators, as they are often without means and competent staff.

3.4.5 What are the requirements for developing successful partnerships?

This session, organised by CILSS, in particular made it possible to share the results of the studies conducted by the Dutch PPP-Lab (water and food security) and for participants to share their experiences of partnership, in particular STAMP and MODHEM (G4AW).

Basic principles
A partnership is not a static result, but a dynamic process. Be aware that partners evolve (also under the effect of the partnership), that the context evolves, that the relations between partners continuously evolve. A partnership is like a plant that requires constant care to germinate, grow, mature. After sowing, you have to hoe, weed, water... It is a daily maintenance job, so that the partnership pays off... It must also be planted in the right place (a favourable environment with water, soil and sunshine) and you must know how to take care of it (be a competent gardener).

A partnership also requires individuals who participate on behalf of their institutions to be able to act as negotiators within the partnership on behalf of their institution, while promoting the partnership within their own organisation and/or the outside world. It is therefore important for everyone to be aware of their personal stake, their organisation's stake and that of the partnership, so as to be able to act with integrity.

The discussions focused on the following elements:

Factors prior to establishing a partnership
Take the time to design the project in order to understand the situation and know the context, the real needs of the beneficiaries and their degree of ownership of the actions to be carried out, evaluate the skills and capacities of the partners involved, their power/influence, clearly identify the intentions and interests of each one, write the rules and state the specific contribution/responsibility of each partner, establish the foundations of trust.

Factors for maintaining a partnership
On the one hand, with the help of lawyers, establish a partnership framework that allows you to engage actors (individuals and institutions) through a consortium agreement that defines the operating rules for the partnership. Define indicators to evaluate actors in their performance of services, in order to determine the partnership's continuity. But also maintain and continuously develop trust, relationships, monitor the process, etc.

Factors for the sustainability of a partnership
Prepare the foundations of sustainability from the beginning. Engage technical and political actors who have the power and interest to make a difference. Move quickly towards dispensing with the grant through funding from internal sources.

Learn more: https://ppplab.org

3.5 PLENARY SESSION (DAY 2)

3.5.1 Digitisation of African Agriculture

This presentation was made by the CTA's Benjamin Addom and aimed to share the results of an ongoing study by the CTA and Dalberg on the state of agricultural digitalisation in Sahelian Africa.

The data collected and the interviews conducted for this study provided a database of 365 active agricultural digitalisation systems in the sub-Saharan Africa region, about one-third of which were in the Sahel. These systems are divided into 5 categories: consulting services, market relations, financial inclusion, value chain management and data intelligence. This database contains information on these types, used in certain countries, their impact, and details on economic models.

The conclusions of this study permitted the following observations:

1. Scaling up agricultural digitalisation in the Sahel remains a big challenge, but the expected gains can be enormous because of the Sahel's particular situation: overpopulation of large tracts of land, a security situation of growing concern, as well as the effects of climate change on land fertility and water availability, and an unemployed youth population. Rural connectivity in the Sahel remains one of the limiting factors for successful digitalisation.
2. Consulting services are the most represented.
3. Isolated farmers have more to gain from access to new information made possible by digital solutions. However, it must be realised that there is a very large difference between registered individuals and actual users: the impact is not in the number but in the actual use of the services offered.

4. Women remain underrepresented among users.
5. It is difficult to make the digitalisation of agriculture work in the free markets of Sahel commodities, though this is where price transparency is likely to generate the greatest benefits.
6. There are high-potential solutions to the challenges of agriculture in the Sahel, including digital climate insurance, soil mapping and pasture guidance.

3.5.2 Dutch intervention strategy in the Sahel

As presented by Maarten Rusch, charge d'affaires of the political bureau at the Dutch Embassy in Burkina Faso, the Dutch policy for developing the Sahel contains four priority areas of intervention:

1. Promoting employment and inclusive growth;
2. Improving girls' access to education and income;
3. Promoting climate-smart food security, access to renewable energy and integrated water management;
4. Strengthening the rule of law and good governance mechanisms, in particular for better accountability.

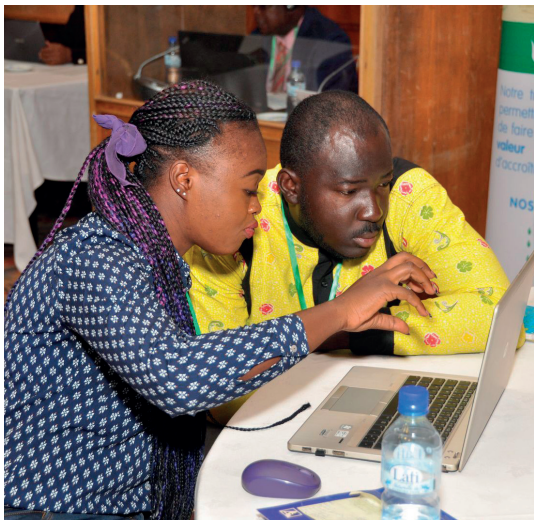
The Netherlands also wants to respect their commitment made with the Paris agreements in relation to climate change.

The Netherlands also has a policy framework for an integrated international security strategy. Based on our participation in UN-led security initiatives, as most recently in Mali through MINUSMA, we focus on particular areas such as:

- Improving relations between civilians and the military,
- Establishing trust,
- Mechanisms of accountability against human rights violations,
- Human security and
- Strengthening the links between security and justice.

As he recalled in his speech, *the use of ICT and geospatial data in water and agriculture is a relatively recent development, bringing innovation to the sector. The nature of information technology and geospatial data also leads to the appearance of a new generation of people who understand the underlying concepts and who face the challenge of their potential for application in water and agriculture. This use offers new employment opportunities and new careers in the agricultural sector, which remains the backbone of most Sahelian economies, both now and in the near future.*

So this conference is in itself a good example of our strategy. It contributes to at least two of our four priority areas: Climate-Smart Agriculture and promoting employment and inclusive growth. This conference is an opportunity to see whether the use of ICT and geospatial data in water and agriculture can also meet another of our goals: increasing girls' access to education and income.



3.6 GROUP SESSIONS

These sessions were designed to present initiatives and/or programmes in search of partnership (technical and/or financial). Participants could register for the session of their choice.

3.6.1 The Data Initiative for Development of the Sahel (AKVO)

The initiative was presented by Akvo, along with the partnerships sought. The main finding during this session was that the diversity of thematic data sources is large and access by the main users is limited. This leads to redundancy in the production of collected thematic data with different quality levels. This initiative is considered very useful and adapted to requirements.

The following points were made:

- The Sahel data initiative will ensure the quality of the collected data, its viability and above all the involvement of various actors in collecting data (without redundancy) and decision-making based on evidence and facts (data usage);
- Establishing a platform to organise the collection of thematic data and ensure the reliability of the data collected;
- This initiative will enable each community, in the near future, to have the data it needs to take charge of its development;
- With this initiative, new employment opportunities will be available to young people, who can engage in business activity using the data available on the platform to produce services.

3.6.2 Geospatial Data and ICT for Irrigation (CILSS)

The session provided participants with better awareness and understanding of PARIIS and its knowledge management tools, namely SIREI and its knowledge management system, and the World Coalition for Water in the Sahel. The partnerships sought for these two topics of interest related to water management are, among others, audio-visual communication professionals, and organisations for women and young people who work in the sector of irrigation, extension services, etc.

The major challenges identified during the session are as follows:

- The SIREI's capacity to provide the battery of information relating, inter alia, to production (needs, costs, forecasts), land (water potential, irrigable land potential, land laws), sectors, markets and marketing chains, financing possibilities, risks (risk of flooding, disasters, pollution, waterborne diseases, erosion, drought, etc.), water resources for irrigation (level of groundwater load, availability, quality, quantity, area, etc.), meteorological information (rainfall, hydrology, etc.), irrigated perimeter developments (areas under development, areas affected, etc.).
- The use of ICT to manage water towers.
- Sharing irrigators' concerns by ICT.
- Dissemination mediums for the knowledge generated.
- Availability of groundwater resource data.

3.6.3 Geospatial Data and ICT for Water Management (Blue Deal)

The purpose of the session was to foster collaboration/partnership between participants and FASO-KOOM in the field of drinking water and efficient water management through the use of ICT and geospatial data. These possibilities for partnership are both business opportunities and job openings for young people and women.

This session was in line with the conference by addressing key themes such as:

- Efficient water management,
- The use of ICT and geospatial data to increase the resilience of populations to climate change;
- Employment opportunities for young people and women in the field of ICT use and geodata for water management and agricultural advice.

The workshop's content can be summarised in three (3) main points, which are:

- An intention of partnership was created between the start-up BeoogoLAB, working in the field of digital entrepreneurship, and Faso-Koom, to consider ICT and geodata solutions for efficient water management;
- The use of geospatial data and ICT for water management needs to be developed further in Burkina Faso;
- The main constraints in the field are the weak digitalisation of existing data, and the difficulty of accessing data produced by state facilities.

3.6.4 West Africa Open Data Project (GODAN)

The purpose of this session was to present the West Africa Open Data Project. The main conclusions of the session were:

- Many efforts are under way at all levels (governments, NGOs, civil society) in setting up IT services for agricultural development and promoting youth/female employment
- We must dedicate more energy and resources to implementing digital services in order to develop agriculture in our countries
- Collaborations between actors in the agricultural sector need to be strengthened for greater harmonisation of the impact of the actions undertaken

Following the session, an intention of partnership was formulated between GODAN, Burkina Faso's Ministry of Development of the Digital Economy and Post, CILSS and Akvo. This project will be continued with contacts throughout West Africa.

3.6.5 Opportunities and Barriers Faced by Agripreneurs in the Sahel (RVO-Agribusiness TV)

This session was organised by RVO and Agribusiness TV. The discussions were conducted using the experiences of the agripreneurs present in the room. Discussions were conducted on the following topics: human capital and skills, finance, infrastructure and policy, market information and access, and support structures.

The main conclusions were:

- Young entrepreneurs often lack innovative technical knowledge in agriculture because they are not available or accessible in rural areas. They only have traditional knowledge that is no longer sufficient in the current context;
- The education system does not stimulate the development of skills in entrepreneurship or agriculture;
- The local market is not always ready to welcome innovative products. Marketing and communication skills are required;
- Road and digital infrastructures are insufficient outside urban areas;
- Long delays and difficulties in mobilizing financial resources for a contractor to move from the idea to the realization of the initiative;
- Need time and energy to develop digital solutions;
- Banking systems not always favorable in the agricultural field in other words, it is difficult to obtain bank loans without clear guarantee in the agricultural field which is considered risky by the bankers;
- Absence of ICT skills for agriculture from funding agencies;
- Lack of digitalization policy for agriculture in most Sahelian countries;
- Large distance between central government decision-makers and farmers in rural areas;
- Support is mainly provided to urban actors and little information on support is available in rural areas; Sustained support over time should be provided to a selection of agri-takers and not sprinkling aid on many.

As a result of this session, it was recommended to dedicate more detailed study to these barriers, which may differ from one country to another.

3.7 SIGNATURES OF PARTNERSHIP AGREEMENTS

The STAMP project shared its experience and lessons learned during the first phase. Maarten Rusch, representing the Dutch government in Burkina Faso, officially reiterated his support for the initiative with a view to scaling it up in a second phase. On the sidelines of the conference, an agreement was signed between SNV and Orange Burkina Faso to continue the MODHEM project.

3.8 HIGH LEVEL PANEL

The High Level Panel aimed to propose a discussion on the topic of how digitalisation can contribute to transforming agriculture in the Sahel. It brought together the following people:

- Safia Youssouf, CEO and founder of Smart Village (Chad)
- Fatima Ahler, Director of the Digital Cartography Agency (ACN) in Niger
- Djimé Adoum, Executive Secretary of CILSS
- Alain Traoré, representative of ECOWAS and UEMOA
- Joseph Nana, technical adviser to Burkina Faso's Minister for Development of the Digital Economy and Post (MDENP)

Alain Sy Traoré was the first to speak on this issue, emphasising the fact that transformation, which is a key word for all the policies, must refer to modernisation, adaptation and production. For this, information systems are needed to make decisions.

According to him, ICT can:

- Help decision-making at the level of producers and ministries: how to make wise production and guidance choices, for example, in pest management strategies;
- Contribute to economies of scale, free sharing of information to facilitate efficient and effective interventions;
- Enable easy market access through competitive market information systems;
- Enable increased food and nutrition security through community involvement in producing information on local situations;
- Provide data to feed early warning systems in order to guide strategies and choice of sowing periods, for example;
- Promote the emergence of agricultural education through learning from shared videos about successful experiences or production techniques of certain speculations;
- Allow greater transparency and the promotion of free access to information and data, in order to bring the anticipated changes to African agriculture.

Joseph Nana (MDENP) reviewed Burkina Faso's national policy provisions in the field of ICT promotion and geospatial data to support the transformation of agriculture in Burkina Faso.

Safia Youssouf (Smart Village) emphasised the need to improve access to digitised data, especially for rural populations who are generally far from the coverage areas of mobile networks in some countries. This is simply the right to information. For this to succeed, we

need to invest in information dissemination infrastructures and ensure training for users, in order to create champions within communities in the use of (geospatial) data and make them models of change for others.

Dr Djimé Adoum (CILSS) gave an analysis of the African demographic context and highlighted the important role of young people, who must be the engine of change for this agriculture. For this, he advocated developing laws and strategy that will promote and encourage vocations in the field of digitalisation. Training is an important link for the successful emergence of start-ups that will offer multiple solutions, create jobs for young people and help broaden the tax base in these countries.

This remark about the need to train more young people, especially girls, was taken up by Fatiman Ahler (ACN), herself a young entrepreneur in the field of ICT for development. There is a strong demand from communities and development partners which must be responded to appropriately and urgently. In her words: *We cannot talk about young people and women without giving them the floor.*

Where to start this transformation?

For the Executive Secretary of CILSS, we must reduce the red tape between countries, which will free up initiatives and thus facilitate trade and business opportunities

The Representative of the MDENP emphasised the need to see young people explore and make greater use of the opportunities offered by ICT for the country's development. He recalled that ECOWAS has excellent terms and laws that promote exchange, but it is still necessary for young people to be informed and make the most of the possible business opportunities between the countries in the community.

All the speakers agreed that raising awareness and training the various actors, particularly young people and women, was particularly important for the successful transformation of agriculture.

In conclusion, the different panellists wanted to impart a few messages to the participants, such as:

- The importance of developing green innovation to avoid the mistakes made in other countries;
- Developing partnerships and synergies to avoid duplicating efforts;
- The importance of regional organisations to establish initiatives and move forward together;
- Ensuring that the magic wand is used properly for everyone's benefit;
- The imperative need to take care of these young people in order to orient them towards efficient use of this ICT, to ensure transformation and to give themselves business opportunities, otherwise the same ICT may end up being used to destabilise the region.

3.9 CLOSING SPEECH

In her closing speech, presenting the conclusions of the conference, the Minister for Development of the Digital Economy and Post expressed, through her technical adviser, how important it was to be *aware of regional initiatives and programmes that ask for our support, to create new synergies and promote the meeting of actors who can enhance each other.*

She also recalled that *in the current phase of negotiation for continuation of the Cotonou agreements between the ACP countries and the European Union after 2020, her Ministry is championing accelerated digitalisation for development of the Sahelian zone. In Burkina Faso, agriculture is one of the economic sectors where several ICT solutions are already implemented, and our thinking is in line with the country's National Digital Development Strategy which states that by 2025, Burkina Faso will have a competitive digital economy that impacts positively, sustainably and inclusively on the country's development. This inclusion of digital technology in the national development benchmark is based on the global consensus that ICT is at the heart of the competitiveness of nations and businesses, and is the main driver for achieving the Sustainable Development Goals (SDGs).*

Present at the panel and at the closing of the conference, the Executive Secretary of CILSS, Dr Djimé Adoum, expressed his satisfaction with the organisation of the conference and made a commitment on behalf of CILSS to ensure wide dissemination in the countries of the results achieved, and to continue the partnership with the Netherlands Space Office (NSO) and the Dutch Ministry of Foreign Affairs (MoFA).

Finally, the technical adviser of the Minister of Agriculture and Hydro-agricultural infrastructure closed the conference and reminded the support of her Minister for digitalisation initiatives. She invited CILSS, NSO and the Dutch Cooperation at large to put in place the necessary means to capitalize on the fruits of the meeting and make operational the resulting recommendations.

4. CONCLUSIONS AND RECOMMENDATIONS

At the end of a conference very rich in content and exchanges, the participants and organisers noted that the anticipated results were generally achieved.

The following conclusions and recommendations are worthy to note:

ICT services and geospatial data play an important role and are a key factor in behaviour change and agricultural development.
This observation was made regularly during the conference, in various working groups, particularly in the feedback from the G4AW projects presented and discussed on the first day. In particular, the participants experienced how these services can lead young people to work in the agricultural sector because professionalisation makes it possible to increase the added value in the agricultural chain. During the discussions, participants emphasised the importance of a programme such as G4AW, for which improvements should be made to enable it to achieve all these objectives. In particular, the current duration of the programme is too short to allow the economic model to be viable. The wish was expressed that this programme be continued with some adaptations to increase its impact.

Quality data is needed and must be available
Whatever the actors, **there is a consensus on the major role of quality data and information in decision-making, and the importance of making them available to different users**, whether for planning development interventions, implementing them, or other uses such as developing data-based business activities. Great attention should be paid not only to the concept of open or at least shared data, allowing development for the benefit of all, but also to respect for people and personal data. The two partnerships being developed and presented during the conference (Open Data Coalition and Sahel Data Initiative) were very much welcomed by the participants, and their continuation was recommended.

Tools/services/digital products must be tailored to users' needs

It is essential not only to analyse in detail the needs of those using these tools (taking into account local conditions), but also to develop truly adapted products/services. In particular, index insurance is seen as a very interesting service and an opportunity to make producers in Africa more resilient to the climate. For the majority of tools/services/products, it is essential to **create adapted support** to allow effective and efficient use and thus increase the impact.

Human capabilities must be developed

Significant efforts need to be made in strengthening capacities to help small producers become "professionalised" in order to become more resilient and productive, especially in the face of climate change. Awareness and training on the need for effective risk mitigation measures are key factors (production techniques, management principles, index insurance, financial literacy, etc.). Finally, the needs and constraints of marginalised groups must be taken into account in the design and implementation of ICT services for development interventions, as well as the information channels used to "include" them.

Youth jobs are not limited to agricultural production

Many jobs are anticipated in the agricultural value chain (processing, packaging, transport, sales). The use of ICT can help develop these markets for young agripreneurs. Finally, training must also be considered to increase the technological knowledge enabling the design and development of digital tools, especially for young women. Most of the conference participants felt that job creation would more likely be in selling outreach services to rural people. It is therefore jobs throughout the agricultural value chain that need to be developed. To promote these jobs, we will look for people who have succeeded and are seen as **champions and social models to copy**.

The proposed computer and data services must be sustainable

Different business models exist, and sustainability is not related solely to the number of users of a given service. A diversified range of services offered in the same sector for the same users, but also similar services in other sectors, may be useful. The positive role of aggregators has been highlighted in the discussions: both data aggregators to provide services to individuals and user aggregators to achieve economies of scale.

Digital services and products are not free

Paying for the services offered is an important discussion to place in the local context. The development of small and medium private enterprises can only be considered if someone pays for the services/products/tools they offer. So the question is who pays for what and how. Is it a government grant, a donor's gift, a direct sale to a user or group of users (cooperative or farmers' association)? In this context it is extremely important to realise that developing technologies is not free, nor is their operation and maintenance. Services offered for free often have hidden costs that limit the sustainability of services.

Young entrepreneurs face barriers that need to be addressed

This message recurs as an observation made during different sessions. These barriers are varied (human capital and skills, finance, infrastructure and equipment, policy, support structure, etc.). They need to be explored by country (detailed analysis of barriers), taking the gender dimension into account, to better understand them and find appropriate solutions. In particular, this analysis could make it possible to:

- Establish a dialogue with banking institutions, because it is important to make them understand the barriers faced by entrepreneurs and discuss solutions to overcome the financing difficulties of business projects and facilitate bank guarantees;
- Provide support at the regional level to lower tax rates on business inputs and products, particularly for young people and women (in the perspective of transforming agriculture towards sustainable practices in the face of climate change)
- Develop support adapted to farmers in rural areas by listening to their real needs, ie strengthening the managerial capacities of entrepreneurs and strengthening the technical capacities of entrepreneurs to implement climate smart agriculture and sustainability of actions.
- Create/strengthen meeting frameworks between start-ups and SMEs, technical and financial partners, statistical and spatial data providers and farmers' organisations, to develop innovative platforms for the dissemination of understandable (geo)data.

Effective commitment from countries to digitalisation of agriculture to make it climate smart and sustainable

States must engage in the process of digitising agriculture in order to transform it and make producers more resilient. A favourable institutional and regulatory framework is considered necessary to be able to offer services at a reasonable cost, while guaranteeing a good quality of service. Government support often plays an important role in raising awareness because it gives credibility to the services offered. The legislation of some Sahelian and West African countries should be reviewed, as it does not always allow optimal use of technology. Some ministries think that controlling data is a source of power, while the other extreme is entrusting the data to multinationals, making it inaccessible for the development of local SMEs. One could therefore speak of a political choice of judicious digitalisation of agriculture by default. It is important that this digitalisation be done to implement climate-smart agriculture, that is to implement innovative approaches and measures, often different from the measures traditionally used: in the face of climate change, new approaches must be considered, and ICT and geospatial data can make agriculture not only smarter but also wiser.

Partnerships are needed

It is important to identify the strategic actors who can (and want) to make a difference in development, but often the role, intentions, interests and influence of these actors are poorly understood or insufficiently used. Awareness of these interests and influences is fundamental to enable sustainable and inclusive transformation of Sahelian agriculture. Networking between these partners is desirable. In particular, centres of excellence in the Sahel countries dedicated to data and agricultural digitalisation could foster coordinated development of new businesses, providing tailored tools and services and enhancing partnerships.

5. APPENDIX

Programme de la conference regionale

Ouagadougou (Burkina-Faso), 17-18 avril 2019 à l'hôtel Laïco - Ouaga 2000

Mercredi 17 avril 2019

HORAIRES	OBJET / PRESENTATIONS
7h30 - 8h00	Accueil et Enregistrement des participants
8h00	Début de la cérémonie officielle
8h00 - 8h45	**CÉRÉMONIE OFFICIELLE** • Discours du Secrétaire Exécutif du CILSS • Discours du Représentant de la CEDEAO/UEMOA Intermezzo: Slam • Discours du Représentant de l'Ambassade des Pays-Bas • Discours d'ouverture par le Ministre Coordonnateur du CILSS Photo de famille + interviews des officiels
9h15 - 12h30	**SESSION PLÉNIÈRE** • Les données géo-spatiales pour l'Eau et l'Agriculture : challenges et opportunités : Mr Harm van de Wetering, directeur de l'Office Spatial Néerlandais (NSO) • Le fond ABC et l'Agriculture Intelligente face au Climat : Mr Laurent Stravato, directeur Togo et Benin du FIDA, bureau régional Afrique de l'Ouest et Centrale • La numérisation, moteur de croissance pour les femmes et les jeunes du secteur agricole : Mme Béatrice Gakuba, Directrice du réseau africain des femmes en agribusiness (AWAN). ***Expériences de terrain : les TICs et données géo-spatiales pour l'Agriculture Intelligente face au Climat*** • Quand les satellites guident les éleveurs au Sahel par Mme Catherine Lecôme (SNV) • Les données, les services et les sciences ouvertes et inclusives par Mme Nouhou Koutcha Mariama et MrPaul Bartel (programme SERVIR- Afrique de l'Ouest)
12h30 - 14h00	Pause déjeuner
14h00 - 15h15 (partie 1) **15h15 - 15h45 Pause-café** **15h45 - 17h00 (partie 2)**	**Exposition et partage de connaissances : 5 thèmes possibles** • Les données géo-spatiales et les assurances indicielles pour les producteurs (EARS - expérience du projet SUM) • Les services basés sur les données géo-spatiales : est-ce commercialement rentable ? (CTA-expérience du projet MUIIS) • Quels modèles économiques pour les services TICs et données géo-spatiales ? (Truvalu – expérience de plusieurs projets G4AW) • Quel rôle pour les agrégateurs ? (VIAMO) • Les conditions de partenariats à succès (Agrhymet - expérience du projet Modhem)

Jeudi 18 avril 2019

HORAIRES	OBJET / PRESENTATIONS
9h00 - 10h00	**SESSION PLÉNIÈRE** • Croissance numérique: Etat de la transformation de l'agriculture africaine – Présentation des résultats préliminaires pour le Sahel de l'étude CTA/Dalberg par Mr Ben Adom, CTA • La politique Néerlandaise de coopération au développement pour le Sahel – Mr Maarten Rusch, chargé d'Affaires du bureau politique de l'Ambassade des Pays-Bas au Burkina Faso • Rapport des travaux de groupe du mercredi
10h00 - 11h00 (partie 1) **11h00 - 11h30 Pause-café** **11h30 - 12h30 (partie 2)**	**Discussion en groupes : exploration de partenariats autour d'initiative et programmes proposés par diverses organisations** • Initiative des données pour le SAHEL (Akvo) • Les données géo-spatiales et les TICs pour l'irrigation et le pastoralisme (CILSS) • Les données géo-spatiales et les TICs pour la gestion de l'eau (Blue Deal- DWA) • Projet de données ouvertes en Afrique de l'Ouest (Ministère du développement de l'économie numérique et des postes du Burkina Faso, GODAN, Akvo) • Les opportunités et les barrières rencontrées par les agri-preneurs du Sahel (Agribusiness TV & RVO)
12h30 - 14h00	Pause déjeuner
14h00 - 14h45	***Plénière*** • Rapport des travaux de groupe du jeudi matin • Présentation de partenariats – signatures de conventions
14h45 - 15h00	Arrivée des officiels
15h00 - 16h00	*Panel de Haut Niveau sur le thème :* ***La digitalisation de l'Agriculture en Afrique***
16h00 - 16h30	Pause-café
16h30 - 16h45	Conclusions de la conférence par Mme la Ministre du développement de l'économie numérique et des postes du Burkina Faso
16h45 - 17h00	Discours de clôture par Mr le Ministre coordonnateur du CILSS




Ministry of Foreign Affairs of the Netherlands

G4AW
GEODATA FOR AGRICULTURE AND WATER

Netherlands Space Office

Netherlands Enterprise Agency