

SEACRIFOG Project Stakeholder Consultation Workshop

Side event of **SASSCAL Science Symposium 2018**

Mulungushi International Conference Center, Lusaka, Zambia

Wednesday 18 April 2018, 8.30-13.00



** Photo courtesy: Meshach Shikabeta, Zambia **

SEACRIFOG Project 3rd Stakeholder Consultation Workshop

SEACRIFOG Project 3rd Stakeholder Consultation Workshop took place on 18th April 2018 as a side event of SASSCAL Science Symposium 2018, which took place at Mulungushi International Conference Center, Lusaka, Zambia. The workshop was organized by SEACRIFOG project partners (CMCC, CzechGlobe, SASSCAL, ICOS and Thünen Institute of Climate-Smart Agriculture).

The aim of the workshop was to identify general ***needs and knowledge gaps in the area of research infrastructure related to land use change (LUC), food security, GHGs observations, carbon stocks, climate change mitigation and capacity development***. As the African point of view on the SEACRIFOGs goals is of major interest, stakeholders from Southern-Africa were asked to contribute with their perception concerning particular topics:

- (i) Land-use change implications for food security*
- (ii) GHG observations, carbon stocks and climate change mitigation*
- (iii) Capacity development*

The workshop had format of participative stakeholder consultation event, in world-café mode, where participants actively discussed the above-mentioned topics. The target audience were key stakeholders connected to these areas in Southern-Africa, represented at the SASSCAL Science Symposium 2018 (16th – 20th April 2018, Lusaka).

In total, 36 participants from academia, non-governmental and governmental sector attended the stakeholder workshop (see Annex 2: List of participants) provided feedbacks and crosscutting outcomes. A summary of workshop evaluation by participants is attached in Annex 3.

Workshop agenda:

8:30 – 9:00	Registration
9:00 – 9:15	Welcome and introductions (<i>Joerg Helmschrot, SASSCAL</i>)
9:15 – 9:30	Presentation of SEACRIFOG project (<i>Veronika Jorch, project coordinator Thünen Institute of Climate-Smart Agriculture</i>)
9:30 – 9:45	Introduction to the world café (<i>Eliška K. Lorencová and Manuel Acosta, CzechGlobe</i>)
9:45 – 10:30	World café (3 thematic groups ¹ facilitated by SEACRIFOG team)
10:30 – 11:00	<i>Coffee break</i>
11:00 – 12:00	World café (3 thematic groups facilitated by SEACRIFOG team) - <i>continued</i>
12:00 – 12:30	Report back to the plenary (10 min. each group)
12:30 – 13:00	Plenary discussion and conclusions

¹ (1) LUC implications for food security, (2) GHG observations, carbon stocks and climate change mitigation, (3) Capacity development

Summary of the SEACRIFOG Project 3rd Stakeholder Consultation Workshop

Official opening of the workshop – Dr. Joerg Helmschrot, SASSCAL



Photo 1: Dr. Joerg Helmschrot, Director Science & Technology SASSCAL

Dr. Joerg Helmschrot, Director Science & Technology SASSCAL, welcomed participants and stated importance of such an event and need for development of greenhouse gas observational system for African continent.

SEACRIFOG project overview – Veronika Jorch, Thünen Institute



Photo 2: Veronika Jorch, SEACRIFOG project coordinator

Coordinator of SEACRIFOG project, Ms. Veronika Jorch, Thünen Institute of Climate-Smart Agriculture welcomed participants and provided overview of SEACRIFOG project aims.

The goal of the SEACRIFOG project (*Horizon 2020 Coordination and Support Action, Supporting EU-African Cooperation on Research Infrastructures for Food security and Greenhouse gas observations*) is to promote the EU-Africa cooperation dialogue at different levels (policy, science, society) on the following

themes: land use, land use change, climate-smart agriculture and food security, carbon cycle and greenhouse gases observations, in order to support adaptation to and mitigation of climate change. SEACRIFOG aims at developing *an integrative network for long-term and sustainable cooperation among African and European environmental research infrastructures*. The focus of the project is the design of an adaptive concept for a pan-African observational systems on radiative forcing (GHG and aerosols).

Introduction to World Café format - Dr. Eliska K. Lorencova, Dr. Manuel Acosta, CzechGlobe

Eliska K. Lorencova introduced participants the World Café format that was used during the world café discussions. The World Café methodology is a simple, effective, and flexible format for hosting large group dialogue.



Photo 3: World café discussion tables

World café is a structured conversational process intended to facilitate discussion, initially in small groups and then linking ideas within a larger group to access the collective as well as local knowledge in the room.

Summary of main World café findings:

TOPICS	WORKING GROUP THEME		
	Land use change implications on food security	GHG observations, carbon stocks and climate change mitigation	Capacity development
Data needs and gaps	Data needs: - Soil data - Meteorological data (Zambia: accurate weather forecast missing, only 33 meteo station in the country.)	Data to compile GHG emission inventories are very coarse and lacking accuracy. Since countries are non-Annex I parties to UNFCCC, most GHG emission inventories are calculated based on Tier I indicators and coefficients.	Data needs for land use mapping - missing detailed mapping concerning land use changes, information and data are often fragmented, coming from various sources
	Most important is communication of data!	Data sharing needs to be improved – often hard to access data as ministries and other owners do not share data readily	Data used for GHGs reporting do not usually originate from the reporting country and are taken from elsewhere.
	Better access to data is needed in Zambia. Very centralized structure that needs to be decentralized. Example of good data policy: Integrated Land Use Assessment (ILUA) project.	Data is needed to improve the close of the carbon budgets and improve the regional balance of carbon fluxes (not only atmospheric, or remote sensing, but also in situ data needed).	
	Transboundary information share is needed.		
	Botswana: Data might be available, but link between research and extension officers is weak.		
	Zambia: National Remote Sensing Centre monitors LUC using earth observation.		
	Angola: lack of observational system for natural hazards, risk mapping in preparation.		
Knowledge needs and gaps	Zambia: diversification of crops is governmental issue, but not applied by farmers.	Data gaps in national, regional and continental GHGs observations in Africa.	Missing ArcGIS capacities, availability of software (open source often not available)
	Zambia: Agricultural National Plan exists, but		Capacities in GHG observations and

	people do not know about it, limited capacity of extension officers.		measurements often lacking
	Inadequate equipment in terms of computer software (GIS, remote sensing)		Inaccurate data use - missing experience in data analysis (e.g. if data are used by students the processes of data validation and sensitivity analysis is in some cases omitted, which leads to inaccurate results).
	Zimbabwe: lack of training, land reform led to farming without agricultural knowledge.		
Infrastructures	Missing decentralization and capacity building.	GHG observation infrastructure in Zambia, Botswana, Angola, Namibia: Hardly anything. And if there is anything, it is unclear what happens to the data and how the data can be accessed	Missing research infrastructure on GHG observations.
	There is a need for information platforms/centers like SASSCAL		
	Lack of information for farmers about processing infrastructures.		
	Angola: Food waste due to lack of transport infrastructure.		
Obstacles	<p>LUC drivers identified:</p> <ul style="list-style-type: none"> - Economy - Agriculture (including beef production) - Mining - Infrastructure development - Illegal logging - Land grabbing - Urban/residential development- urban migration - Water management - Energy demand- e.g. charcoal production leading to deforestation - Population growth - Governmental policy's- 	Financial resources	Gap between educational programs and demand of future employers (gap between industrial and governmental demand for skills of the graduates and the actual focus of university programs. Educational programs at universities often do not respond to the demand of the labour market).

	<p>especially in case when subsidies for seeds, fertilizer, etc. increase the expansion of agricultural land</p> <ul style="list-style-type: none"> - Inadequate information and integration of indigenous knowledge on mitigation of insect/pests infestation - Lack of secure land tenure among rural people (land tenure inequality) - Land tenure- depends where people are from, even in one country the land tenure system may vary. Differences appear when land is private land, traditional administrated or public administrated 		
	Zambia: Agriculture is intensified, often monocultures established.	Short-term economic interests usually prevail over long-term environmental interests.	Duplication of efforts (too much of duplications between different efforts that do not know about each other).
	<p>Botswana: Mining for diamonds in the game reserves (Kalahari Reserve) is a problem. Beef export and tourism important economic factors affecting LUC.</p>		Financial constraints (e.g. Zambia: the country has National Biodiversity Strategy and Action Plan (NBSAP), but no financial mechanisms to support the goals of this Strategy. When donors offer funding, in some cases it covers goals of the strategy only partially, or in a fragmented way. The external funding is also unstable, can be halted or interrupted at any time.)
	Angola: Slash and burn practices for agricultural land. Charcoal and timber logging drivers for LUC.		Unstable political environment
	Namibia: Bush clearing for feed stock, biomass for biofuel and charcoal.		
	Better infrastructure for	Need for GHG data,	Need for practical

Solutions	farming (irrigation and other farming facilities)	established research infrastructure network across African continent.	“hands-on” experience during the university education (e.g. in form of internship, traineeship programmes) that would enrich training of students and support them to provide knowledge and capacities for start of their professional carrier. The imbalance in training was mentioned in case of Angola and Zambia.
	Encouraging crop diversification, promotion of traditional farming and sustainable practices	When properly measured, the GHG data should be consolidated, verified/scrutinized in order to ensure their quality.	Coordination of activities across SADC countries (e.g. establishing a land use change platform that would provide monitoring and evaluation).
	Need for encouraging people for more efficient production	Need for a long time series which implies a certain level of sustainability that is usually not achieved with the research projects carried out in Africa.	Initiatives coming from the countries - The driving force for the capacity development should preferably come from the countries themselves. It should be rather self-driven process, which would increase the ownership concerning capacity development.
	Employment opportunities (in agriculture people are normally not employed)	Focus on regional and continental information (compared to one species or narrow area focus).	Educational programmes reflecting labour market demand.
		Newly acquired data would feed into the national reporting processes (where calculations often use emission factors that are not suited for Africa) and the modelling activities.	Educational programmes on GHG observations - need for particular training when establishing the network.
	Namibia: Biochar project, to produce biochar from bushes and combine it with manure leading to reduced fertilizer use.	Need for educating, informing, training the local communities for sustainable practices.	Appropriate use and monitoring of NDCs - Nationally determined contributions that were established by Paris Agreement in order to achieve long-term goals and can be used for CC mitigation and capacity

			development, also in the area of GHG monitoring.
			Capacity building across various levels and stakeholders - needs to be done at different levels – students, researchers, government officials, public society as well as institutional capacity building (not only capacity building of the individuals).
			Linking research with applications - outcomes not only for use of researchers, but also to be applicable for end-users (e.g. governmental, private sector).
			Science-policy interface and communication of science and research results - need to share and communicate the research results with end-users, such as private and governmental stakeholders to support decision-making based on research outcomes.

Annex 1: Transcript of world café discussions

1. LUC implications for food security

Topics focusing on land use and land use changes, adaptive land management, climate smart agriculture, with the objective to support food security in Africa

- What are the main trends in land use and land cover change in Southern Africa?

The main drivers for LUC in Southern Africa were determined as:

- Economy
 - Agriculture (including beef production)
 - Mining
 - Infrastructure development
 - Land grabbing
 - Urban/residential development- urban migration: people end up without job and go into the nearby forests for logging
 - Water management
 - Energy demand- e.g. charcoal production leading to deforestation
 - Population growth
 - Governmental policy's- is related especially to the point agriculture as it was claimed that subsidies for seeds, fertilizer... increase the expansion of agricultural land
 - Inadequate information and integration of indigenous knowledge on mitigation of insect/pests infestation
 - Lack of secure land tenure among rural people (land tenure inequality)
 - Land tenure- depends where people are from, even in one country the land tenure system may vary. Differences appear whether land is private land, traditional administrated or public administrated
 - Illegal logging
- Zambia: "The system is good, but if it comes to public/governmental land more land is given to the elites."
 - Zambia: "Indigenous people are led to very small parcels."
 - Illegal logging is a problem in many forest reserves. Same as in Zambia people migrate to live in forest reserves, for example in Lusaka forest. People were encouraged to go into the forests when roads were built.
 - Zambia: The smaller cities do not face the same development of fast urbanisation. Most development and expansion of the city happens in Lusaka.
 - Zambia: in the 1990th building of houses suddenly exploded in areas around cities/Lusaka, because previously building in those areas was forbidden.

- Zambia: Shifting agriculture is vanishing, because of population growth. Agriculture is intensified, becomes permanent and often monocultures are established. This leads to low soil fertility.
Now there is a new smallholders approach. People are encouraged to work and have small farms aside. This leads to a smallholding urban expansion in the woodlands.
 - Botswana: Shifting cultivation is not common. There is a lot of land gazetted for cattle. People can get land presold for 99 years. Only for urban land, you pay rates. People cannot decide what to do with their land; they need permits.
 - Botswana: mining for diamonds in the game reserves (Kalahari Reserve) is a problem. Other factors like beef export and tourism are as well important economic factors for the country. All influence LUC.
 - Botswana: cities are encroaching into rural areas- people in the rural areas lose their land.
 - Angola: Shifting Agriculture is performed often using slash and burn practices. Charcoal and timber production is a driver for LUC.
 - Namibia: Bush-clearing efforts are drivers for change (bush clearing for stock feed or biomass for biofuel and charcoal)
The government in Namibia identified the problem of bush-encroachment. The people panicked and cleared the bushes down without knowing the effects. There is the need to look into the effects seriously, for example in terms of carbon stocks.
- What observational network and data is used to monitor these trends?
- Zambia: National Remote Sensing Centre registers urbanisation, agriculture, LUC... through earth observation
 - The forest department of Zambia faces a lack of capacity, especially in terms of funding. Therefore forest monitoring is limited.
 - There has been lack of an observational system for natural hazards in Angola. Now there is work done on this topic. The main risk zones are identified and multiple risk maps prepared/in preparation.
 - Botswana: Land board
 - Zambia: land ownership is registered depending if it is communal (traditional) or public land. When villagers want to sell communal land it needs to be titled.
 - The Ministry of Agriculture keeps data in Zambia. And the ILUA (The Zambia Integrated Land-use Assessment (ILUA) project funded by FAO was implemented by the Government of the Republic of Zambia (GRZ) through the Forestry Department of the then Ministry of Tourism, Environment and Natural Resources (MTENR) between 2005 and 2008, it provides large amount of data, public available.

- What research infrastructure (observational network) is currently lacking?
 - There is a need for information platforms/centres like SASSCAL (common platform for information sharing).
 - Inadequate equipment in terms of computer software (GIS, remote sensing)
 - Transboundary information share is needed
 - Better access to data is needed in Zambia- the structure is very centralized, data/information centres need to be decentralized
 - There exists a Zambia agricultural national plan, but people don't know about it as the extension services do not have enough capacity. Challenges are the transport to remote places, lack of equipment and human capacity (sometimes 200-500 people and 1 single extension officer at one meeting). The long-run perspective/sustainability is missing.
 - In Botswana data might be available, but the link between research and extension officers is weak. The communication is difficult and it is not easy that information arrives in policy or at farm-level.
 - Angola: Mining is a huge problem. There is a gap in the governmental organisation. It is complicated to get information, as the communication about land occupation is low.
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- What limits food production in your country / region today?
 - Zambia: sometimes it lacks preservation methods for storage/storage systems- post-processing of products could be a solution
 - Angola: there is a lot of food waste, as local markets cannot take up the current harvests. The lack of transport of food limits the distribution of food.
 - Zambia: Accurate weather forecasts are lacking. Especially in the Northern Province there are not enough weather stations to feed in data in the forecast (only 33 meteorological stations in Zambia)
 - Zambia: lack of information for farmers about processing infrastructures Greenhouses could be a solution or irrigation and water harvesting systems to get less dependent on rain feed agriculture. Dams for irrigation exists, but are mostly limited to commercial farmers.
 - Zambia: More/better infrastructure (e.g. irrigation and other farming facilities) for local people is important.
 - Zambia: Local people should be encouraged to produce a variety of crops.
 - Zambia: Regions select representatives of farmers, but information to the institutions and from the institutions get lost along the way and is not reaching the farmers.
 - Zambia: Chemicals are expensive, but people became dependent. The promotion of traditional farming would be good.

- Zambia: the traditional land system is endangered. Land is getting sparse/land is fragmented. Empowerment for traditional landownership is needed.
 - Zimbabwe: The land reform program led many people into farming without knowledge. There is/was no training. This led to problems like erosion and lack of food. The governmental policy needs to be set in place earlier.
 - Zambia: Diversification of crops is a governmental issue, but not applicable by local farmers. Local farmers do not have the financial capacity to grow diverse crops. Micro crediting and farmers cooperation's are not common.
 - There is a lack of communication! The government set's wrong priorities; they build infrastructure for agricultural zones only when a donor comes in.
 - What is missing in terms of infrastructure: Decentralization and capacity building!
 - Zimbabwe: Extension officers are vanished
 - Transport to local market very difficult due to road/transport related issues.
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- What are the expected impacts of land use change on agricultural production?
 - What are possible responses to the impacts of land use change on agricultural production? (e.g. through adaptive land management, climate smart agriculture...).
- Zambia: Need to encourage people to produce more efficient, but not to expand.
 - Need for adaptable intervention for sustainable practices
 - Zimbabwe: The solution needs to be inclusively. Without including farmers in the approaches it is not working.
 - Governments only look on economic values but minor on the environment. It needs to be balanced.
 - Zambia: People need employment opportunities. In Agriculture people are normally not employed- thus if there is an urgent need (for example school fees) people sell their stored food fast, even so the price might be not high due to price fluctuations. This would change if people were employed.
 - Namibia: Biochar project, to produce biochar of bushes and combine it with manure- leading to reduced fertilizer use
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- What data are needed to support decisions regarding adaptive management, while ensuring food security?
- Soil data
 - Meteorological data
 - Mostly important: communication of data!

- Are these data available and easily accessible/sharable among different stakeholders categories? No, just poorly and inadequately.

2. GHG observations, carbon stocks and climate change mitigation

Topics focusing on research infrastructure for GHG measurements and carbon cycle, and their implication to climate change mitigation.

- From your professional perspective, why are GHG observations and carbon stocks important?
 - Compilation of national GHG inventories, intended nationally determined contributions (INDCs), reporting to UNFCCC
 - Carbon cycle is crucial for ecosystems
 - Understand which mitigation measures to take and where. Understand which (economic/land use) activities to allow and which ones to avoid
- What is the actual situation in Southern Africa concerning GHG observation infrastructure?
 - Zambia, Botswana, Angola, Namibia: Hardly anything. And if there is anything, it is unclear what happens to the data and how the data can be accessed.
- What kind of research infrastructure (observational network) for GHG observation is available in your country?
- What research infrastructure (observational network) is currently lacking?
- What data (e.g. on-site measurements, satellite data, model projections,...) are used to compile GHG emission inventories in Southern Africa?
- Since countries are non-Annex I parties to UNFCCC, most GHG emission inventories are calculated based on Tier I indicators and coefficients. Therefore very coarse and lacking accuracy
- What are additional data needs and constraints?
 - Data sharing needs to be improved – often hard to access data as ministries and other owners do not share data readily
- Who are the major stakeholders for GHG observation/climate change research in your country / region?
 - Focal points to UNFCCC and in charge of corresponding data: normally environmental ministries

- Other challenge: Short-term economic interests usually prevail over long-term environmental interests

The need for GHG data is acknowledged by most participants. Data is needed to improve the close the carbon budgets and improve the regional balance of carbon fluxes. This means that data from atmospheric or remote-sensing measurements are not sufficient and in situ data is also needed, especially for oceans and terrestrial fluxes. The data would feed into the national reporting processes (where calculations often use emission factors that are not suited for Africa) and the modelling activities. Some participants insisted on the fact that climate models are usually developed elsewhere in the world and do not answer the African needs.

The GHG data should be consolidated, verified/scrutinized in order to ensure their quality. There should also be long time series which implies a certain level of sustainability that is usually not achieved with the research projects carried out in Africa. These projects often concentrate on one species (tree) or one narrow area, although there is need for regional or continental information.

Having accurate GHG data could help connect the management practices to the observed carbon sinks or sources in order to assess the efficiency of the practices and preserve ecosystems. Some participants mentioned that a value should be given to ecosystem services so that people are more aware of their importance. More generally, the importance of educating, informing, training... the local communities has been stressed. The example was given of farmers who are sanctioned because they cut trees without anyone explaining why it is forbidden to do so.

Referring to the dual nature of SEACRIFOG (GHG observation and climate-smart agriculture), the participants insisted on the competition between different interests, timelines, or targets. Policies that support debushing might support agricultural practices but represent a negative impact in terms of carbon sinks. Politicians want policies that produce immediate results (during the period of their own term) which is not always compatible with climate-smart objectives. In the same manner, the efforts made by an individual to adopt climate-smart practices might produce benefits that do not come to them, but to a larger community. The burden is then carried by an individual but the return has to be shared with others.

Finally, the question of feeding back the results of any research project to the users on the ground, at the lowest level, has been stressed. It is essential that SEACRIFOG (like any research project) produces tangible impact for the people.

3. Capacity development

Topics focusing on training, educational programmes and other methods to develop the capacities needed to manage the two above mentioned topics.

- Who are the end user groups that should receive information related to LUC and GHG observations?
- Are the results of the research sufficiently transferred to these groups? Through which channels are the results communicated?
- Do the potential users have the capacity to interpret and apply research results? What is missing to make research results applicable in effective way by potential users?
- What capacities are needed to better address LUC and implications to food security / GHG observations and climate change mitigation?
- What training and educational programmes are needed?
- Who can supply this training and educational programmes? (science, research institutes and universities)

Challenges in capacity development (regarding land use change monitoring, GHG observations and climate change mitigation)

➤ *ArcGIS capacities, availability of software*

Missing capacities in mapping software, such as ArcGIS. Software needs to be updated, open source software in research field is often not available. Need to keep up with the latest developments and cooperation in issue related to remote sensing in order to effectively respond to challenges linked to land use changes.

➤ *Capacities in GHG observations and measurements*

Capacities in GHG observations and measurements are currently often lacking and need to be developed when establishing the observational network on greenhouse gas measurements and observations.

➤ *Practical “hands-on” experience during the university education*

In many cases opportunities for internships are missing at regional and national levels in SADC countries. Students lack practical experience during the university education (e.g. in form of internship, traineeship programmes) that would enrich their training and support them to provide knowledge and capacities for start of their professional carrier, or for development of their own start-ups, so that the graduates can become self-starters. The imbalance in training was mentioned in case of Angola and Zambia. For instance, in Zambia, more emphasis is given to achieving the results, passing exams than on practicality and practical experience.

➤ *Gap between educational programmes and demand of future employers*

Discussed gap between industrial and governmental demand for skills of the graduates and the actual focus of university programmes. Educational programmes at universities often do not respond to the demand of the labour market.

➤ *Inaccurate data use - missing experience in data analysis*

Due to missing capacities, data can be used in inaccurate way. For instance, if data are used by students the processes of data validation and sensitivity analysis or in some cases omitted, which leads to inaccurate results.

➤ *Duplication of efforts*

Too much of duplications between different efforts that are not known between each other.

➤ *Data needs and gaps – land use mapping*

Missing detailed mapping concerning land use changes, information and data are often fragmented, coming from various sources.

➤ *Financial constraints*

Example of Zambia: the country has National Biodiversity Strategy and Action Plan (NBSAP), but no financial mechanisms to support the goals of this Strategy. When donors offer funding, in some cases it covers goals of the strategy only partially, or in a fragmented way. The external funding is also unstable, can be halted or interrupted at any time.

➤ *Unstable political environment*

Need for stable political settings and stable instruments to support capacity development in the countries. Unstable government, or frequent change in government (e.g. fluctuation of the political parties) have negative influence on capacity development in the area of LUC and GHGs observations

Solutions for capacity building and development (in the area of land use change monitoring, GHG observations and climate change mitigation)

➤ *Coordination of activities across SADC countries*

Coordination of activities across stakeholders in SADC countries is needed – for instance in form of a land use change platform that would provide monitoring and

evaluation of land use changes – or platform coordinating GHGs monitoring across SADC countries.

Need to make the system more sustainable for instance, by establishing these platforms. Necessity for the platforms and institutions to be independent of/from the government, independent from current political situation.

➤ *Initiatives coming from the countries*

The driving force for the capacity development should preferably come from the countries itself. It was mentioned that the driving force should not be led by experts from developed countries, but it should be rather self-driven process, which would increase the ownership concerning capacity development. Discussed need for National system to support and coordinate national capacity development in the particular country.

➤ *Internship and traineeship programmes at universities*

Internship programmes are needed to provide students with hands-on real life experience to deal with practical aspects, tasks and job duties. Students would need to acquire their knowledge also in practical examples and application. Practical experience is need for contextualization of the particular focus/educational area and will increase graduates chance for employment.

➤ *Educational programmes reflecting labour market*

For graduates, who just finished the studies, it is difficult to find employment. Usually they do not have any practical experience and educational programmes often do not reflect the demand of labour market and job opportunities for particular skills and research focus. For instance, in Zambia, there is very limited employment opportunities for GIS graduates, which leads to the loss of the developed capacity of individuals.

➤ *Educational programmes on GHG observations*

Need for educational programmes on GHG observations, so far no measurement stations in Africa, data used for reporting do not usually originate from the reporting country and are taken from elsewhere. Training and updating capacity knowledge, internship programmes to develop protocols and experiments related to the particular region. Mentioned capacity building courses organized by GERICS for capacity development in the area of regional climate data analysis. In the beginning, users by questionnaire assessed their demands and capacities and at the end assessed gained skills.

➤ *Land use mapping data*

Improving data collection and coordination of land use change mapping in order to make information available for decision-makers, monitoring and evaluation purposes.

➤ *Establishment of exchange programmes*

As one of the participants mentioned, a “game changer” could be exchange programmes for researchers as well as students. Contribution among African countries to establish exchange programmes has been discussed.

➤ *Appropriate use and monitoring of NDCs*

Use of UNFCCC NDCs - Nationally determined contributions that were established by Paris Agreement in order to achieve long-term goals. 78% of African countries have ratified their NDCs. However, in many countries is limited awareness about NDCs. NDCs can be used for CC mitigation and capacity development, also in the area of GHG monitoring. Moreover, cooperation at the governmental level about GHG issues is needed.

➤ *Capacity building across various levels and stakeholders*

Capacity buildings needs to be done at different levels – students, researchers, government officials, public society as well as institutional capacity building (not only capacity building of the individuals).

➤ *Linking research with applications*

Outcomes to be applied. Outcomes not only for use of researchers, but also to be applicable for end-users (e.g. governmental, private sector). Participant from Namibia mentioned cooperation with farmers and farmer’s research planning workshop as part of the research agenda. In this case, farmers are end-users, who can benefit from the research outcomes.

➤ *Involving private sector in capacity development*

Need to involve private sector in capacity building, private sector has particular demands for skills and background of the potential employees, but the university education do not respond to these demands. Therefore, there is a need to connect research and academia with private and government sectors.

➤ *Science-policy interface and communication of science and research results*

Connecting research to governmental policy demands. Need to share and communicate the research results with end-users, such as private and governmental stakeholders to support decision-making based on research outcomes.

Annex 2: Workshop participants

SEACRIFOG Project 3rd Stakeholder Consultation Workshop – “Needs and knowledge gaps in the area of land use, land use change, food security, GHGs, and capacity development”

18th April 2018, side event of SASSCAL Science Symposium 2018, Lusaka, Zambia

Organization	Type of organization	Number of participants	Country
University of Zambia	Academia	13	Zambia
University of Botswana	Academia	1	Botswana
Council for Scientific and Industrial Research	Academia	1	South Africa
Zambia Youth Water Network	Non-governmental institution	1	Zambia
Instituto Superior de Ciências da Educação	Academia	1	Angola
University of Namibia	Academia	1	Namibia
Botswana University of Agriculture and Natural Resources	Academia	2	Botswana
Department of National Parks and Wildlife	Governmental institution	1	Zambia
Climate Service Center Germany (GERICS)	Academia	1	Germany
WWF	Non-governmental	1	Zambia
Namibia University of Science and Technology	Academia	1	Namibia
Agostinho Neto University	Academia	1	Angola
National Commission on Research Science and Technology	State Owned Enterprise	1	Namibia
National Remote Sensing Centre (NRSC)	Governmental institution	1	Zambia
Copperbelt University	Academia	1	Zambia
University of Jena	Academia	1	Germany
Global Change Research Center of the Czech Academy of Sciences (CzechGlobe)	Academia	2	Czech Republic
Euro-Mediterranean Center on Climate Change (CMCC Foundation)	Academia	1	Italy
Thunen Institute	Academia	1	Germany
Integrated Carbon Observation System (ICOS)	Academia	1	Finland
Southern African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL)	Academia	2	Germany

Annex 3 - Workshop Evaluation Report

SEACRIFOG Project Stakeholder Consultation Workshop
on user needs and knowledge gaps in the area of land use, land use change, food security, GHGs and capacity development
Side event of
SASSCAL Science Symposium 2018

18 April 2018, Mulungushi International Conference Center, Lusaka, Zambia

This report presents results of the evaluation of the SEACRIFOG Project Stakeholder Consultation Workshop, which was held on 18 April 2018 at Mulungushi International Conference Center, Lusaka, Zambia. The workshop evaluation is based on Workshop Evaluation Form, which was distributed among the participants of the workshop. In total, 29 participants attended the stakeholder workshop. We received 14 evaluation forms, which makes a response rate of 48%. The Workshop Evaluation Form comprised 11 questions. From these, 2 questions were based on 1 – 10 points scale, 3 were open-ended, and in 6 questions, participants could select one of 5 (a-e) predefined responses.

1. How would you rate this workshop overall?

The initial question was on the overall workshop evaluation. Participants could check boxes at the scale from 1 (bad) to 10 (good). Figure 1 illustrates the frequency of responses. The range of responses was from 7 to 10.

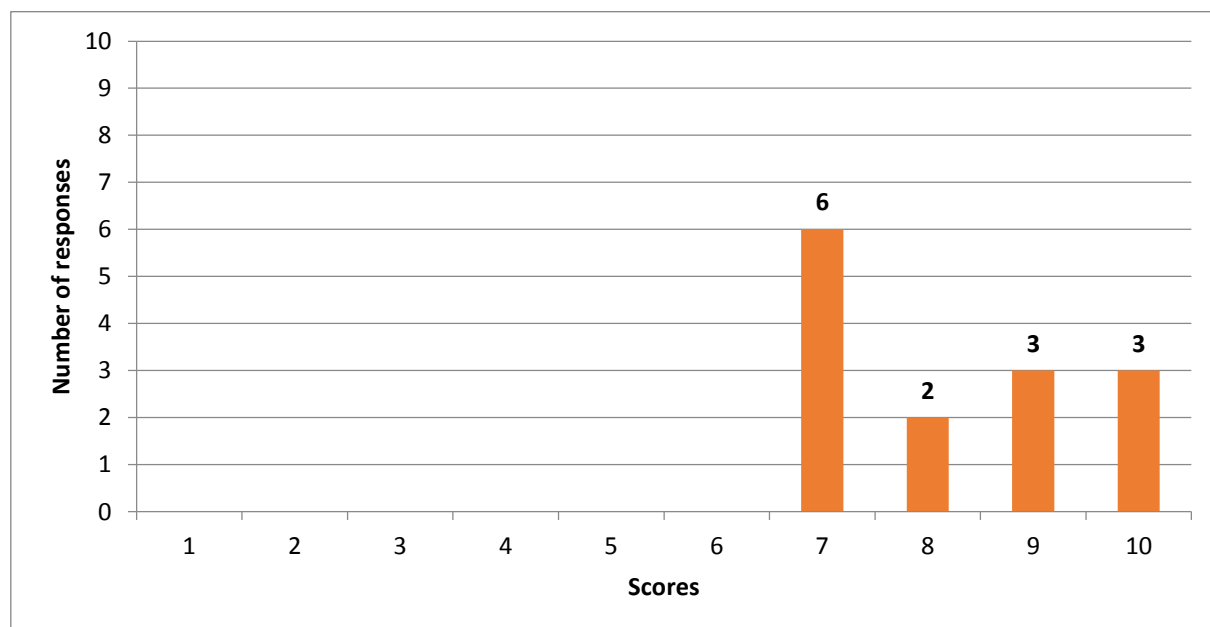


Figure 1. Number of responses for the overall rating of the workshop.

2. How was the duration of the workshop?

The second question was related to the duration of the workshop. Here, the participants had a choice on a bipolar scale, from “too long” to “too short”. The workshop started at 8.30 AM and was closed at 1 PM. Almost all participants felt that the workshop duration was “just fine”, with 4 responses shifted towards the “short” end of the scale (Figure 2).

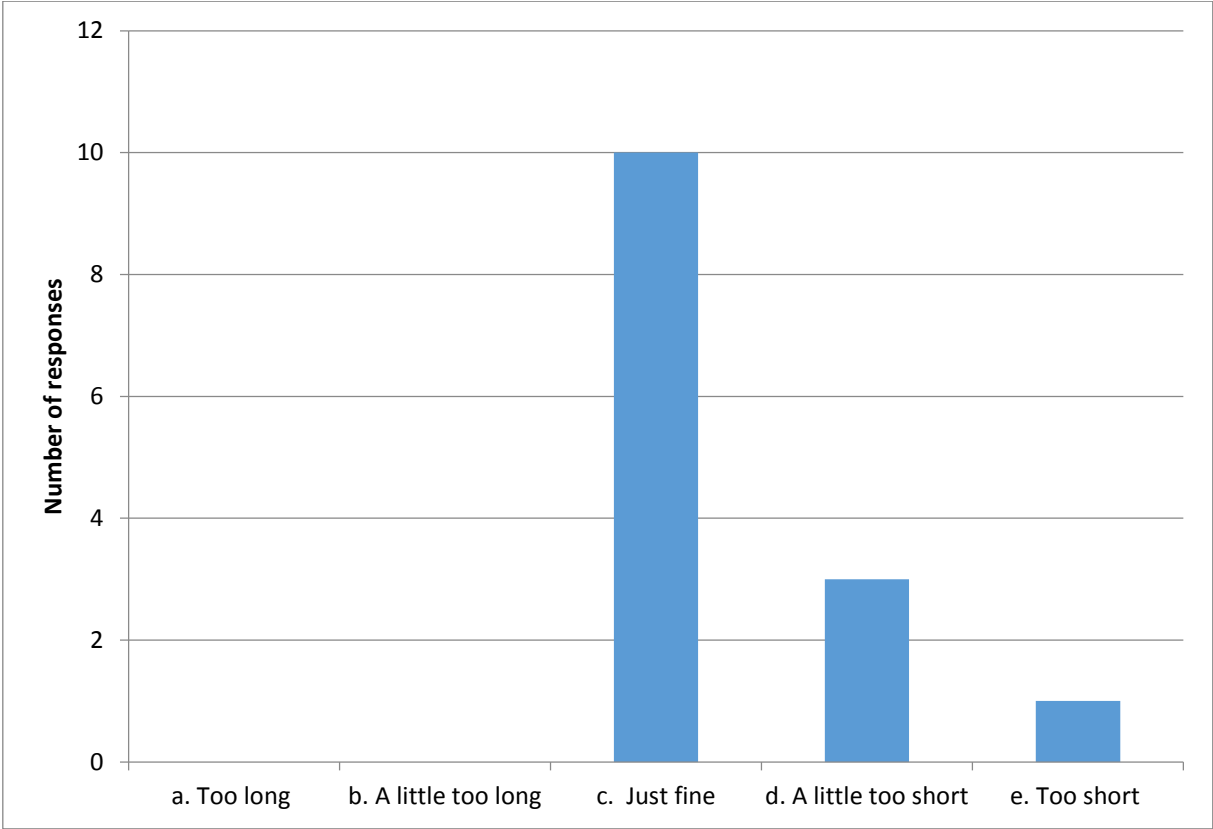


Figure 2. Responses on the duration of the workshop.

3. What were the main expectations you had from the workshop?

Third question was focusing on the expectations from the workshop. Here, participants could check more options. However, majority of participants checked 3 options on average.

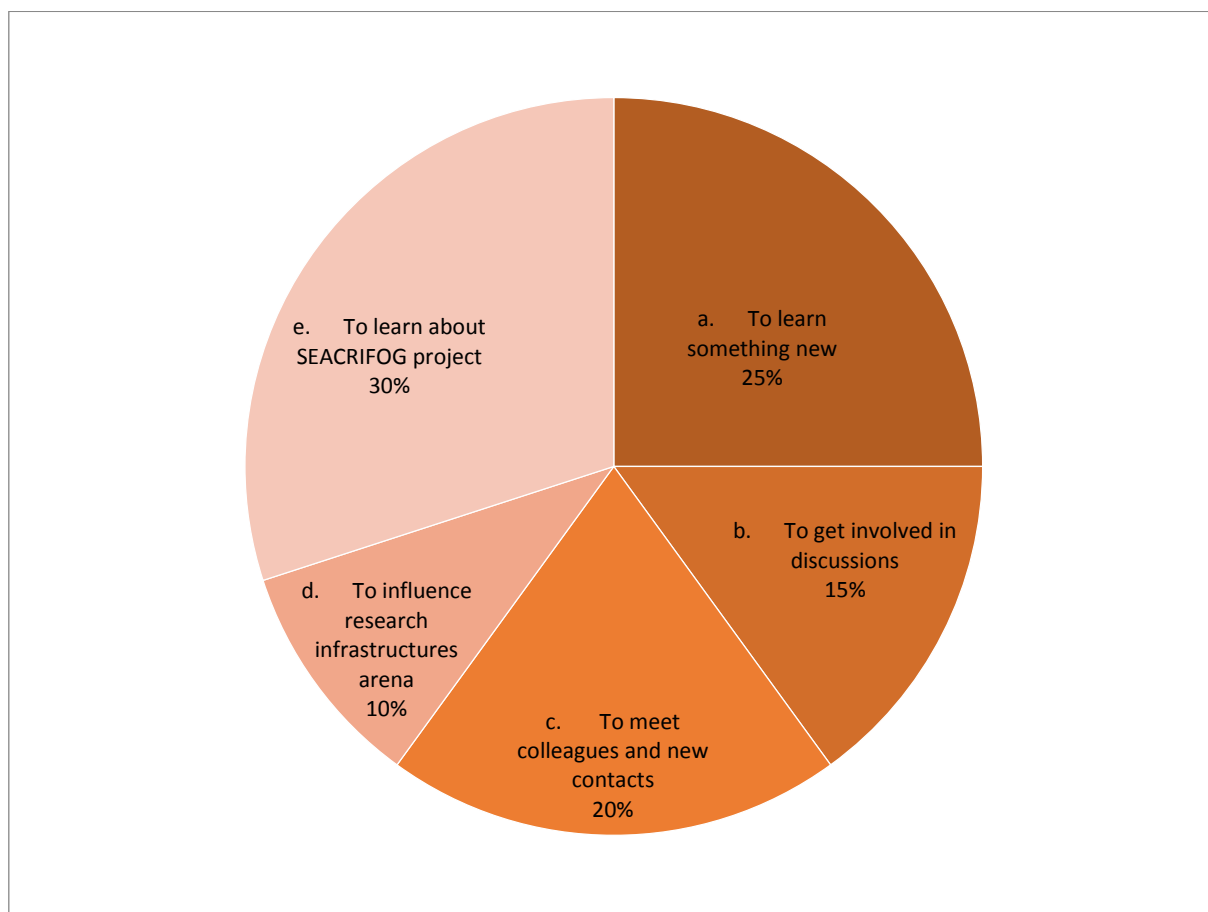


Figure 3. Expectations from the workshop.

Therefore, the frequency of responses was more equitable than in more straightforward questions. The highest number of responses (12) received the option “To learn about SEACRIFOG project” (30% of responses), followed by a response “To learn something new” (10 responses, 25%) (Figure 3). Other expectations included a possibility to get involved in discussions, to meet colleagues and new contacts, and to influence research infrastructures arena. Participants had a chance to comment on other expectations. They listed an option whether we can have infrastructure to support research, and to contribute to the project.

4. How helpful were presentations at the workshop?

As the introduction to the workshop, a series of presentation was conducted (see the main report from the workshop). We asked participants to evaluate the usefulness of introductory presentations. All participants considered presentations as helpful, quite helpful and very helpful, making the workshop objectives easier to understand.

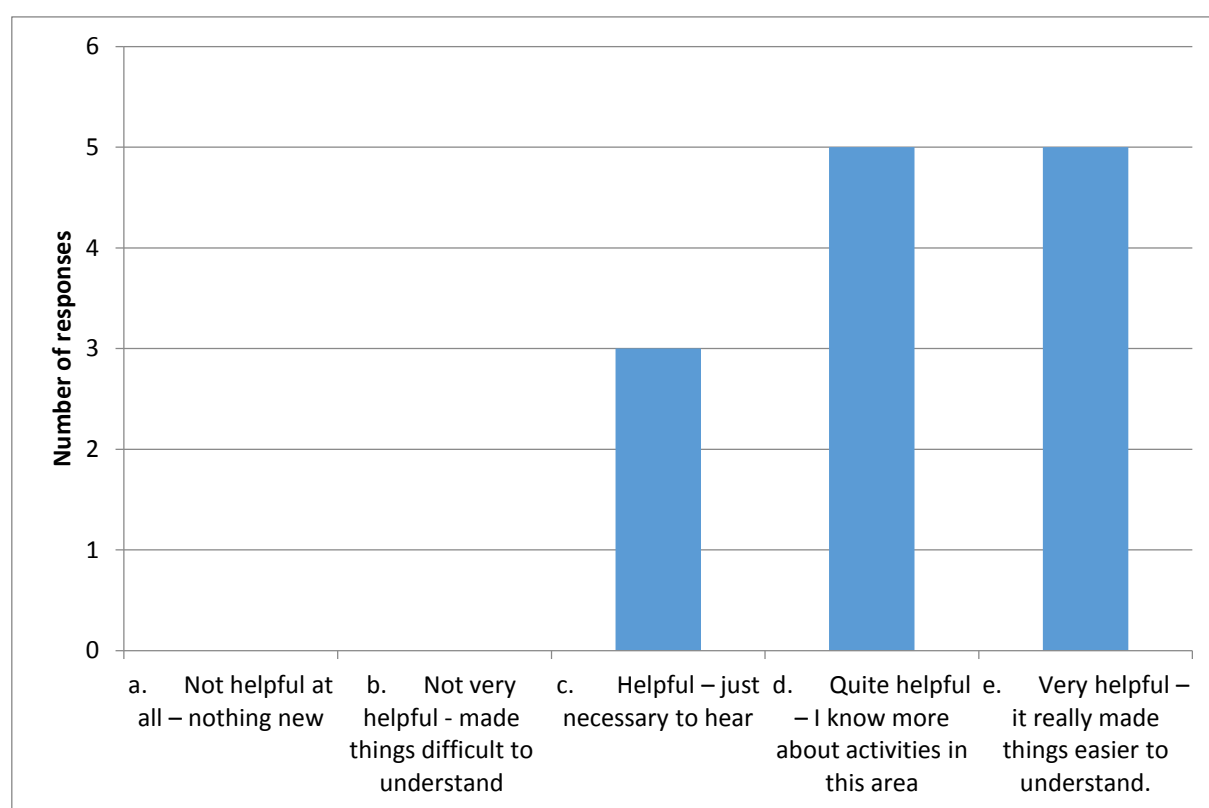


Figure 4. Responses on the usefulness of presentations.

5. How would you rate the discussions in focus groups?

The core part of the workshop was the “world café” format with rotating focus groups discussions. We asked participants how they were satisfied with the level of discussions at the tables. We again used a scale from 1 to 10 (worst to extremely good). Similarly to the first question, we received responses at the range from 7 (quite good) to 10 (extremely good), see Figure 5.

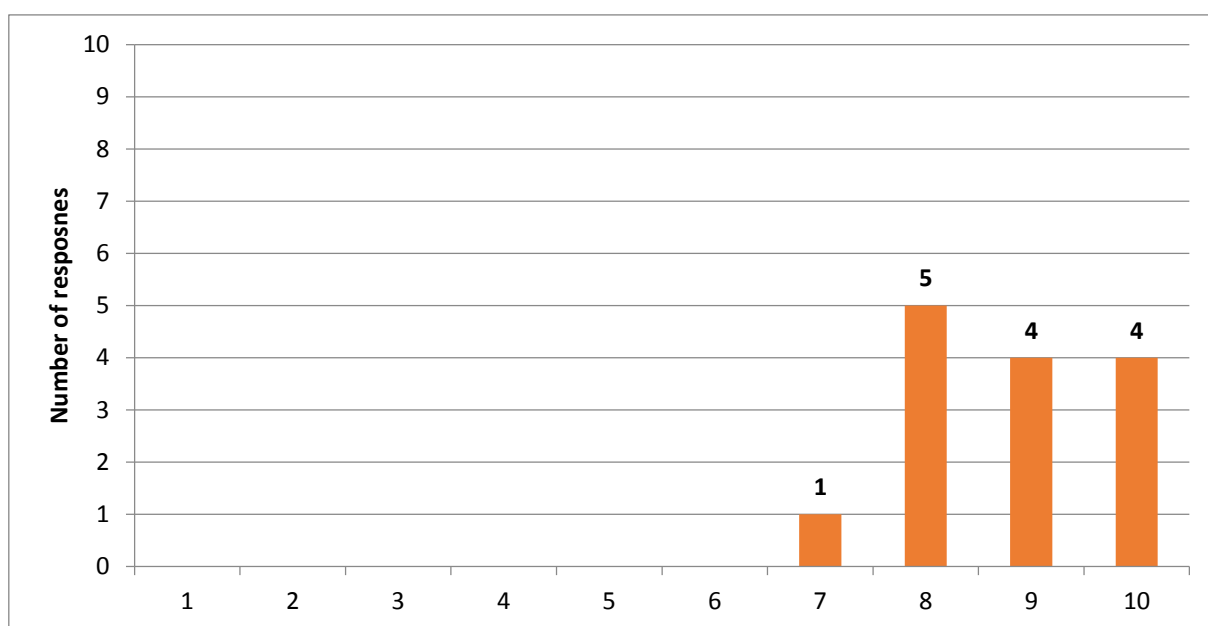


Figure 5. Rating of discussions in focus groups.

6. How well do you think the workshop was organised?

Next question was oriented around the workshop organization (Figure 6). We received highest number of responses for “Well organized” (10).

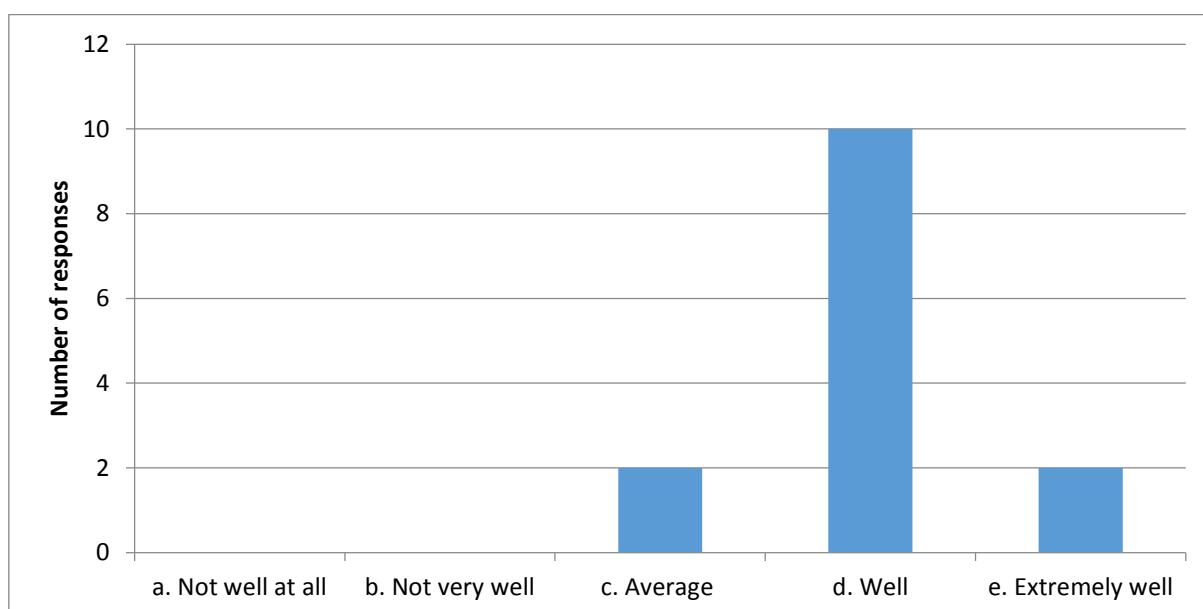


Figure 6. Responses on workshop organization.

7. What was the best aspect of the workshop for you and why? (Please describe)

The survey followed with 2 open-ended questions on best and worst aspects of the workshops, i.e. what participants liked most and what they did not like. Below are listed responses to the best aspect of the workshop question.

Generally, participants liked the participative discussion segment (world café) of the workshop:

- The group discussion because of the interaction a knowledge sharing.
- All aspects discussed were ok, but capacity development was the best because in Africa it is the most challenging aspect and something need to be done!
- Group discussion - they were interactive and very informative.
- World café concept enabled all participants to get a wide understanding of the whole project.
- Group discussion - getting some insight from other sectors that can be involved.

Another important aspect was the sharing of knowledge and information exchange aspect of the workshop acknowledged:

- Sharing different ideas from people was really mind opening.
- People interacting and sharing ideas.
- The consultation and open mindness of participants.
- The focus group discussion.
- Exchange of important views on global climate and land management.
- Knowledge that there is room for carbon research and GHG monitoring.

8. What was the worst aspect of the workshop for you and why? (Please describe)

Majority of forms left the field with the “worst” aspect of the workshop blank. Or there were statements like “Didn’t encounter any, I really enjoyed throughout”, “N/A”.

However, there were some comments concerning the workshop structure and organization:

Comments on workshop organization and structure:

- A wide participation of stakeholders from different institutions would have been ideal.
- Not all the experts in the area of discussions were represented. Some discussions and suggestions maybe biased.

- Being a parallel session, made it difficult to stay throughout the whole workshop.
- Time - we needed more time for discussions.

9. Contributed the workshop to the improvement of your knowledge about the SEACRIFOG project?

In the form, we incorporated a question on the knowledge about the SEACRIFOG project. Majority of participants (9) responded that “I found the workshop very informative in this aspect” (Figure 7). Of course, the SEACRIFOG project was new for participants but presenting topics with which the participants were at least partly familiar. Considerable number of participants found some new information with regard to SEACRIFOG project.

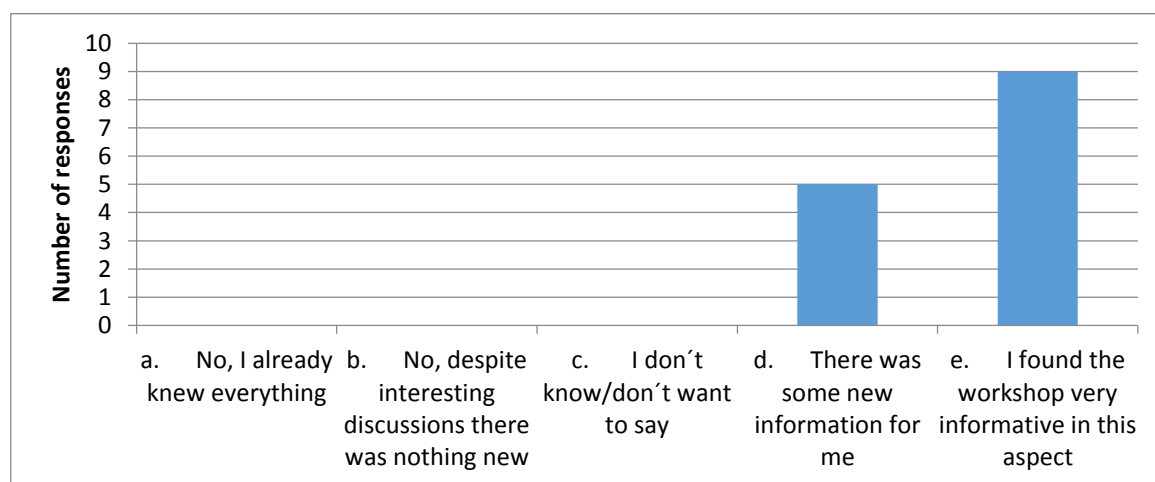


Figure 7. Responses on the knowledge about SEACRIFOG project.

10. Contributed the workshop to the improvement of your knowledge about the topics of interest – land use change, food security, greenhouse gases, and capacity development?

We incorporated direct questions on the improvement of knowledge of participants about the topics of interest of the workshop – land use change, food security, greenhouse gases, and capacity development. We expected also some educational element in the workshop structure. Indeed, majority of participants found the workshop informative in this aspect, very informative (7 responses), or there was at least some new information for them (7 responses), see Figure 8.

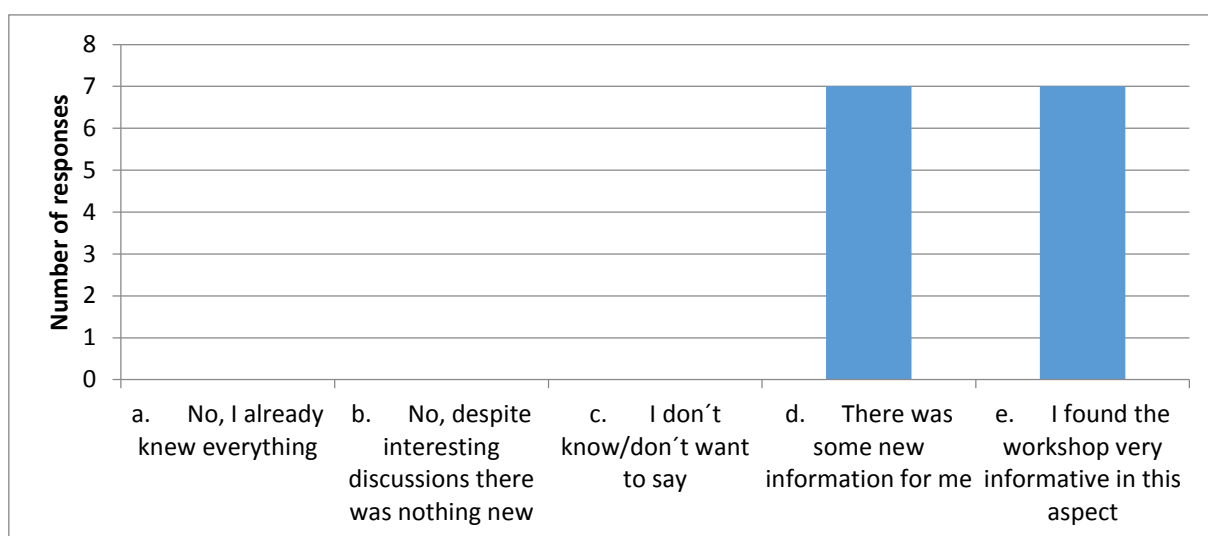


Figure 8. Responses on the improvement of knowledge in the areas of interest.

11. Other comments

As a last question, we incorporated an option of “closing remark” – open-ended question on other comments.

Some of participants suggested the **workshop to be continued/repeated** after some time (“The organizers should hold more workshops in the future to address effects of climate change and set positive tone to environment and sustainability. We hope to interact more in the future on these important issues that affect the globe.”). As one of the participants noted, “We need more of these discussions at a lower level.” Other participant mentioned that “Such initiatives must continue and include policy makers that influence decisions.”

They would also welcome **the cooperation with the SEACRIFOG project** (“I would like to be part of this project.”) or more detailed information about the project (“The next step or process should be communicated to the participants.”).