

## **Minutes London meeting**

Present:

FXJ, FRC, GG, FF, MaxM, P.K.S, VS,LJ,HW,CD,AW,MM

### **Wednesday May 21**

#### ***Introductions by partners, meeting agenda and objectives***

FXJ- Opening the meeting

JW- introduces the concept of land uses according to the best needs of the communities, working from social to policy issues, merging ecosystems concepts.

#### ***Presentations; review of meetings/Conferences attended***

- European Bioenergy Conference in Amsterdam, 2002, by FRC-
- LAMNET-CARENSA\_SPARKNET Workshop in Durban by MM
- Mozambique Sugar Conference, FXJ.
  - o NEPAD New Partnership for African Development, it is a high profile initiative, but taking fossil fuel orientation
- ISAF, FXJ
  - o International Symposium on Alcohol Fuels, introduced economic and governmental policy issues, EIA (Mtbe vs ethanol)
- SADC Technical Sugar Committee Meeting, LJ and HW
- World Bank Energy Week, JW

#### **Comments:**

HW- CARENSA is a worthwhile network which can carry an independent message to SA Government.

HW- Obstacles to renewable energy are at policy level.

CD- Talks about subsidies crops vs biomass crops. Why don't we have biomass plants in Europe?

GG- Bagasse to become a resource where growers are not only paid by sucrose content in SA.

FXJ- Global Potential Scenarios

#### ***Lunch-***

#### ***Thematic Reports***

FXJ - overview of thematic report processes

Metrics:

1. Energy
2. Carbon
3. 'Value' (local, regional, substitution of natural and social capital)

#### ***Presentation of Thematic reports***

##### ***T 1: Agriculture (UND, AUA, FAO)-GG-HW***

#### **Discussion:**

key questions for WP 1 and 16 q's for WP2.

[ 4 papers given out, 2 prepared by Marian, i) WP1 and ii) WP2 plus a position paper by Sabatha T. Qwabe and iv) Draft thematic report]

Three Questions:

1. What is the potential for expanding sugarcane production in southern Africa impact of land reform, climate change, opportunity costs
2. What is the potential to increase yields
3. What is the potential to improve the harvesting and delivery of sugarcane.

Who will participate in SA Sugar Meeting next August

## **T 2: Industry - VS**

### Performance information:

Based on work in Mauritius, Reunion and SA mills will be surveyed. Reason for choosing particular mills is to get the best benchmarks for comparison.

1. To find the most efficient
2. What resources are being used
3. Then try to compare with lower efficiency mills-
4. Then try to identify best practices which have allowed increased levels of efficiencies.

### Other Questions:

- 1- Which Countries
- 2- Who are the stakeholders?
  - a. Sc product
  - b. Sc generation/dist. Stakeholders
- 3- What bioenergy cane options?
- 4- Findings
- 5- How to proceed?
- 6- What Co-products?

### **Comments:**

JW- There are two relevant issues:

- Topics of interest
- Which would be the barriers

LJ- CARENSA could eventually fill up current gaps of information. CARENSA brings an independent perspective to the dialogue with the industry. which facilitates policies when introducing CDM and other environmental issues.

JW- proposes to show a couple of scenarios from Nakambala, triangle and Mauritius at the industry stakeholder's and to the sugar factories to validate the data.

FJ- Should we have some sort of inception paper 15 days before we meet the industry, with a summary of what has been happening.

GG-HW-FXJ-JW- Discussed about SA consultant, eventually Anthony Williams.

He would get raw material/ work it and will present it to the industry.

Should we have a telephone interview? Maybe it would be repetitive if the same people would be called for a meeting?

Is it too early? Shall we have another stakeholders meeting in one year to present them with more results? Big Concern!

JW- will forward Zim data to Brazil, India, Mauritius and we will try to contact Dennis Tomlison (Illovo SA) and convince him to help us.

### DATA Sources:

- SMRI data set
- Interviews
  - o Economic
  - o Technical configuration

It seems that it is not enough information from these two parameters.

GG- Will circulate questions

Do we want to have an interview or a survey questionnaire?

If so, we should mark it under the confidentiality umbrella

When do we make the survey/interview, before the stakeholders meeting or after?

Should the survey/questionnaire go with the inception report (combined both report + questionnaire/survey?)

Anthony Williams to assess if two surveys are to happen!

### **T3- Markets - FXJ**

[gave out 2 pager outline of thematic report]

1. Introduction
2. institutional foundations for cane resources
3. The southern African context
4. Economic outlook
5. Co-product markets and strategies
6. Policies and regulations
7. CDM
8. Comparing different financing mechanisms (e.g. GEF, regional development banks, National programmes, etc. VS to prepare an outline of this chapter. FF- need to include a section in Chp 4 - could be a case study in Zambia with Prof. Yamba)
9. Conclusions

### **T4- Impacts- JW –**

See power point presentation (4 slides)

### **T5- integration- FXJ**

Gave out overview of potential book chapter and used this to provide overview of thematic report.

Integration could also be 'how to integrate into wider economy'

Max M - how to incorporate small-holders

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### **WP 1 – 2 Agronomy- HW -**

10 countries produce sugarcane in southern Africa but 5 hardly produce any.

Gave power point presentation titled 'maria London may03'

### **CD - Sweet Sorghum**

Yields in European trials have varied between about 40 and 140 fwt/ha.yr with dry matter yeilds of between 10 and 45 t/ha.yr with the highest yields being in Greece and Italy.

Sugar yields of between 4 and 14 t/ha.

Very water use efficient crop.

SS is sensitive to low temperatures but in southern areas irrigation is required.

Serious problem is lodging in windy areas.

#### **Comments:**

HW- need to get a good GIS mapping system in place for both SC and SS.

All need to establish the outline details of the thematic reports to see how and where they need to obtain data from the other thematic areas.

Technical benchmarks

Economic benchmarks

### **WP 3 – Industry- VS**

Power-point presentation

Only large factories above 300tph will survive.

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## **Thursday May 22**

### **Round Table**

Present:

FXJ, FRC, MaxM, Gerry G, FF, Anna Patten & David Cormack (Rabobank), Tony Cohen(Czarnikow Sugar), Vikram S, Sobhonbabu, Constantine D, Helen W, Francis Yamba, Lindsay J, Faraday (EDF Mann), Nick Malpeli (Greenheat), MM.

- Renewable transport fuels and future technology options (UK RTF, ppt presentation), JW
- Renewables in a global Perspective- (ppt presentation FR-C
- Diversification in the Sugarcane Industry, LJ
- Ethanol - Brazilian experience, lessons for Southern Africa, AW

Presentation on behalf of Suani on Brazilian regulations-AW

Estimated learning rate (but based on costs to consumers and not production costs) have shown a learning rate of about 20% since 1975 (see slide based on Goldemberg's work) Ford's flex-fuel engine has a lower compression ratio (c. 9) and so when run on ethanol the efficiency is not great.

The VW version has a compression ratio of 12 but variable ignition timing which makes the efficiency on ethanol higher.

Ford vehicle \$9200 and ethanol \$8700.

Brazil petroleum is taxed at about 50%.

Anhydrous ethanol is duty exempt in Brazil. Hydrous ethanol does pay duty but it is reduced.

- Gelfuel for cooking in Africa – markets and options Nick Malpeli – Greenheat-GelFuel

NM- Gave talk about range of gelfuel products that are being sold in the UK.

Products are WWF certified and have had to make a cellulose sachet version so that the sachet could be burnt. Discussed the problem with sales of gelfuel abroad because of transport costs.

Already use 15MI

Ethanol less risky than a bottle of brandy

Product born in Zimbabwe

6-9% pure ethanol

all products are biomass based: ethanol jar or barbecue gel are clean and no toxic

- Cogen experiences in India, Sobhan P.K.( ppt)

India has a target of 10% renewables in energy mix.

Incentives to mills to modernise and increase efficiency include:

Interest subsidies

Fiscal (tax and others)

During off-season also used other biomass fuels including:

Cane trash (up to 10%)

Maize stalks and cobs, mustard and cotton stalks

Paddy husk, and others

Technologies are dumping and travelling grates

Most common turbine is CEST

Energy requirements for electricity generation has improved dramatically- prior to the co-gen prog required 30 000 kcal/kWh and now down to 4 000 to 7 000 kcal/kWh.

Cost of generation is US\$0.064/kWh (3.3 Rupees per USD)

[Handbook on Sugar Mill Cogeneration in India. eds. Gollakota,S.V., and Sobhanbabu,P.R.K. Winrock International India. Oct 2002. Winrock International, New Delhi, India.]

- Cane Cogen in Brazil and lessons for Southern Africa, AW, (see ppt)

Experience is much less important compared to ethanol.

CEST systems are costing up to US\$850/kW installed

Price paid for surplus electricity is about US\$35/MWh (3R\$ per US\$; 105 R\$/MWh)

New contracts c. 23 US\$/MWh

Case study with partial CEST (450 US\$/kW) IRR6% per year and payback 5 years.

Gov. subsidises 80% of capital cost and provides 'reasonable interest rates' of 20% per year.

New regulation aiming at fostering electricity production from renewables: first phase (1.1 GW for biomass)...

Errors made in Brazilian situation may be more important to southern Africa rather than the limited successes.

- Potential in Southern Africa, Nakambala, Zambia- FY (see ppt)

Potential projected for bagasse surpluses in the region over the next 30 years of about 35Mt? Southern African Power Pool will be important in generating a market

Coal will remain very important in future scenarios.

Biomass energy is negligible so far.

Project a contribution of 80.2 GW from biomass by 2030.

Critical Barriers:

- Decision making process and behaviour (uncertainty and risks due to high investment requirements and low returns.)
- Lack of adequate financial support (in particular commercial capital)
- Relatively low tariff.

Is expected that CDM will contribute only 1 to 10% towards the IRR.

Emerging Green Venture Capital

Advance payments of carbon credits.

If implement above biomass scenario then about 8 Mt per year could be saved. 14 Mt by 2030.

A 60MW plant will cost about US\$100 million to install (US\$1670/kW installed).

Tariffs in the region are extremely low ranging between US\$0.02 to 0.04 per kWh. Carbon prices of between US\$5 and 15 per t CO<sub>2</sub> makes about 5% difference to the IRR but tariff is much more important.

A tariff of between US\$0.05 and 0.06 /kWh then get an IRR of 15 to 20% and if settle on these tariffs then the carbon payments can make a difference.

## **Lunch**

### **Discussion with the sugar industry, Industry Perspectives:**

Mr. Toby Cohen, TC, Czarnikow Sugar, email tcohen@czarnikow.com

Mr David Cormack, DC, Rabo Bank, Director Commodities Relationship Group, cormackd@rabo-bank.com

Dr. Nick Malpeli, NM, greenheat, nick@greenheat.com

- Renewable energy and diversification opportunities in the sugar industry-LJ

Commercial viability is an essential pre-requisite to new ethanol markets.

markets in EU and US could reach 14 to 18 Bl respectively by 2010.

Economics over the past years has always spoken in favour of fossil fuels

Production costs vary with feedstock costs which are related to scale.

- Risk Analysis and Competition - FXJ

Puts-up an equation for calculating the value of the products and co-products.

### **Comments:**

DC- David Cormack (Rabobank International)

Are a Food and Agri business bank and associated areas which provides and 'association' to renewable energy.

Financiers are not investors, social engineers. Role is to lend money and get money back.

Re-iterated problems to do with minimising long term risk.

Project sponsor and credit and country risk are key factors in emerging markets.

Need guaranteed supply and off-take. Put together through a tolling agreement where one company is in charge of supply and off-take.

Income streams- e.g. from CDM, grid provide the 'income streams' and these need to be sufficient to service debt.

If Zambian sugar mill wanted financing to upgrade mill to be an efficient cogen plant. Then would look at existing cash flow and can it cover the debt servicing.

Latest attraction is CDM as an additional financial income to the bank which could provide a firm amount of cash to work a principle and interest rate from.

If can sell to the grid then this would be an additional cash flow but if this is a variable cash flow e.g. differing markets with different tariffs, then would be much more difficult to work out the loan.

Key issues:

- Low tariff price in southern Africa is a fundamental problem.
- If CDM is the thing that brings IRR up to commercial level then any risk associated with it makes it difficult.

Faraday- tax breaks provide good certainty. In India, tax breaks made a considerable difference.

DC- tax breaks are for the benefit of the investor and Rabobank is not an investor it is a lender.

TC- if mandate a significant share of ethanol this could destabilise the sugar market, particularly in areas where erratic rainfall drives demand.

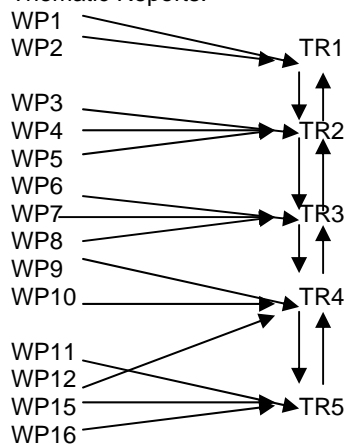
Who are our main stakeholders?

- Sugar Industry:
  - Big companies
  - Small holders
  - Millers
  - Growers
- Financiers/lenders
- 
- Government:
  - National Ministry level
  - Regional level
  - **Industries**
- Other agricultural industries
- NGO's
- Intermediate Consumers
- 
- Final consumer organizations
- 
- automobile Industry:
  - vehicle engine manufact.
- Electricity utilities
- Petrochemical
- Aviation
- Coal Mining, SASOL
- Traders, shipping
- Public health/Environment

Should focus on Gov and NGOs and then the finance will fall into place. Electric Utilities. Ranking and order will follow from the matrix of key factors but will probably be dependent on the final output.

- Risk Analysis and Competitiveness (WP11), FXJ

Thematic Reports:



Links should be established, as to how information passess from one to another working package. It is valuable to know how/what revenue will flow back to local people, at both national and regional level (global competitiveness

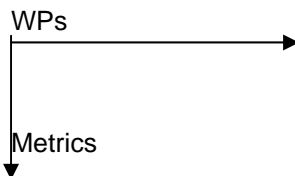
How do we create a working structure so that we can pass information form one WP to the other? Intranet? Our website?

Passwords, should they be one for all or individual? We all decided one password for all!

JW will create a glossary in the Web.

Subst. f social:

- i) Energy
- ii) Carbon
- iii) Local values
- iv) Global competitiveness



Filters we need to account for:

- Scales
- Co-product type
- Rural vs Urban

**Work Packages continuation.....**

**WP 4 - Fibre resources and co-product options- V S**

Amount of cane tops and leaves is 6.29t dry matter /ha.yr c.f. yield of 44.72 odt/ha.yr total dry matter (including roots and tops & leaves). Roots 5.3 odt/ha  
30t cane tops and leaves is available for every 100 tonnes of cane harvested for sugar manufacture.

GCV = 16 MJ/kg and NCV= 14.74 MJ/kg

Energy content is slightly lower than bagasse.

Cane tops and leaves can have moisture reduced by shredding and passing through a 2 or 3 roller mill.

Bulk density is 110 kg/m<sup>3</sup>.

The juice fraction is fermentable (4.5% fermentable and nitrogen content) and can be used to produce additional alcohol.

**WP5 - Sugar resources and co-product options- FRC**

Is existing small area of land under sugarcane in southern Africa a constraint?

**WP 6,7 and 8 was covered by Prof. Yamba in his earlier presentation.**

**WP 9 - socio-economic Impacts-MaxM (see ppt)**

Section 3 - page 11.

**WP12 – Contributions to Sustainable Development-FF (see ppt)**

Plans to start in May 2003.

**Friday May 23**

FXJ, pointed new structures, and open questions about case studies, how to properly incorporate them in a WP. Maybe could be incorporated under innovative projects?

JN, WP9 is very critical. There are several indicators that have to be id i.e. Nitrogen parameters.

**WP 15- International Experiences and Comparisons - VS- (see ppt)**

VS- the Sugar industry going towards centralization in Mauritius, most factories in the South to be closed. They have reached life time and new factories will be constructed by 2006. Critical issues are the scale factor, efficiency of scales (specially if considering upgrading). Crushing season is from June to November in Mauritius.

Seasonal factories:

180 tch per h

3.0 MPa

Steam temp 415 deg C

10 MW

Permanent:

240 tch

see powerpoint file.

110t/h bagasse and coal boiler

High pressure 4.0 MPa

? deg C

22 MW

Electricity Prices: USD per MWh

Intermittent 6.6\$

Seasonal 42

Permanent coal 57.2

Bagasse 63.6

Belle Vue Power House

capacity: 300 tch

Steam pressure 8.5MPa

Steam temperature 530 deg C

Prime movers are electrified

Investment US\$5 million for conversion

Investment in the power house was \$96 million and can use bagasse and coal.

This system has increased the use of coal in Mauritius

In 1998 produced 257 GWh of coal and by 2001 coal production had reached 710 GWh.

A new factory is now being built with higher pressure and temperature but will also use coal.

Are looking for methods to reduce coal use by using cane tops and leaves but still at pilot scale.

Comments:

JW- they are taking steps towards rationalisation due to losses in the past years.

GEF don't provide aid to new plants in Mauritius due to increases in the use of coal in the last years. Coal has been imported from SA, and grew from 24% to 54%.

FXJ- Do we make a 6<sup>th</sup> Thematic report out of the international comparisons?

Should we have a matrix for all case studies among developing countries? Malawi is to be included here and not in WP5.

JW- Units to be used are MEGAPASCALS, add tables of equivalents to binders. We would like to make the cases of Brazil, India and Mauritius, and then capture special features of the rest of the documents.

### **WP13- FXJ - Coordination**

Membership agreements need to be signed.

JW- IC to:

Need to get our three membership agreements signed with CIRPS, CENBIO and BUN.

Need to get King's to sign for first period plus:

Need to get Imperial to sign for second period!

Section 2 of binder but we need to use the loose versions that Mila sent to us separately.

Cost Statements:

need to be submitted to FXJ by Sept 15 and original and electronic needs to be sent (see Section 3, page 22)

Cost Categories: Section 7, page 19 of binder:

FXJ- Contact the Commission for:

- Different people signing the membership agreements
- Natal will join another university in one more year
- CIRPS- change of name

Costs statements- IC to:

- Get originals and send to SEI
- Get always both, electronic and original versions
- Check invoices from KCL
- Check article 17, page 19 section 7

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### **WP 14. Dissemination-JW**

#### **Website-**

check/input key words and CARENSA name when searching in Google. Have a set of hierarchical key word for each of the working packages under the umbrella of each thematic report.

JW- check 'end note' and 'reference manager' to share references used in WP and Website

#### **Book-**

have one environmental briefing, policy briefing (as our newsletters perhaps) which at the same time will serve as advertising for the book.

IID Case studies, how to place them within reporting structure:

- Vikram- Mauritius
- Arnaldo-Brazil
- 2 X Francis- Zambia-Luena
- Sobhan- India
- Max-Zimbabwe

Executive summaries for each thematic report!

JW- International journal  
FRC-Try to publish as soon as you have good material for publications

FXJ- Each Thematic linked to one journal article  
Couldn't we have a master publication plan, and show where a particular publication fits?

GG- will check if proposed journals fits requirements of UND (see list of journals at JW minutes)

**Chapters:**

- Introduction
- International context
- SC in the context of bioenergy: Scenarios
- Agriculture
- Industry
- Economics, policies and Institutions
- Impacts and Stakeholders
- Conclusions

**Potential publishers:**

Elsevier, James X James, Island Press, Taylor and Frances.

**Markets:**

- Industry
- Policy makers
- Academics
- CDM
- Project developers
- Sustainable development specialists

**Funders:**

WWF

Workshops:

- October-November- 2003, Durban
  - April-May- 2004, Mauritius
  - W3 to be defined
- Ask Dirk Pottier for funding for later workshops. Check other DG (FRC ) that are willing to fund workshops.

**Other Comments:**

IC doesn't have any responsibilities but is listed for 20 days work. Same for CIRPS in WP11

Industry perspectives, Section 3, page 16 in binder.

Stakeholders divided into two groups:

1. cane producers
2. energy production

Person chosen must have credibility with both groups.

1. Which countries in region being focussed on?
2. Who are the stakeholders?  
HW - poss two categories (i) sugarcane growers and ii) energy generation sector)
3. What info do we actually need from them?

TOR for Industry liason focal point:

1. Facilitate interaction with list of stakeholders and source for mtg.

2. Compile the scenario 'inception' report with data with background produced by SEI and CEEZ.
3. Market outlook.
4. Entrance into policy debate (barriers).
5. Go to SASA mtg in Guatemala.

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 Survey?

Will get some type of questionnaire / survey in combination with the report.

1. Which countries
2. What stakeholders
3. What bioenergy - cane options
4. Findings
5. How to proceed
6. What co-products / opportunity costs?
7. Barriers & opportunities?

Survey must go to all Stakeholders listed above.

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**Small Groups Discussions: JW, MM, FF-Thematic Report 4-**

Sections:

4.1. Socio-economic impacts

Co-product perspectives:

Work from scenarios and then assess impact on:

Job quality, quantity and sector (particularly small holders)- Livelihoods

Then apply indicators that are/may be relevant:

Health:

Malnutrition

Access to fresh water

Incidence of disease

Access to energy services

Gender

List of data from other WPs:

Scenarios:

Need Jobs & Job Qal and idea of landuse change.

Land use change and demographics (GIS?)

Cultural impacts (Maria quoted model)

4.2. Environmental Impacts

Based on scenarios for co-products.

Near-field and far-field

Nutrient cycles and nutrient balances

- Nitrogen
- Potassium
- Phosphorus
- SOM / SOC / soil micro-organisms

Pollutants:

- Pesticides
- Water quality / hydrology (BOD/COD; sediment load; stream flow reduction activities; pathogens)
- Particulate (negative and positive) - atmospheric

Water use and hydrology

GHG - carbon balances (GWPs)

- leakage (soil carbon?)
- substitution
- coal use
- climate change / local rainfall issues / weed competition
- soil carbon / root mass

Marine impacts

- fisheries
- marine fauna e.g. dolphins

Biodiversity  
 4.3. Contributions to Sustainable Development  
 Substitution of capital (natural, economic and social)  
 Services provided by natural capital (Balmford et al. 2002)  
 IUCN methodology for indicators  
 CIFOR (Criterion Indicators for Forestry)  
 MDGs  
 CDM  
 Direct & Indirect use of woodland / savanna products [get from Helen]  
 Opportunity costs [speak to Gavin Fraser]  
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**ACTION ITEMS**

	1 Month	6 Month
TR1	<ul style="list-style-type: none"> <li>▪ Factual checks on reports</li> <li>▪ Different presentations</li> <li>▪ Provide references to JW</li> </ul>	<ul style="list-style-type: none"> <li>▪ Sweet Sorghum Material</li> <li>▪ Full revision</li> <li>▪ Final comment/review</li> </ul>
TR2	<ul style="list-style-type: none"> <li>▪ Document Industry survey for Mauritius/Reunion</li> <li>▪ Compare with India + Brazil</li> </ul>	<ul style="list-style-type: none"> <li>▪ Resource utilization</li> <li>▪ Bench Marks</li> <li>▪ Draft Report (3,4,5)</li> </ul>
TR3	<ul style="list-style-type: none"> <li>▪ SMRI data (questions about tech. Cent. Fig)</li> <li>▪ Zim data from JW distributed to CEEEZ, UM, WII, CENBIO/UNICAMP</li> </ul>	<ul style="list-style-type: none"> <li>▪ Divide the data set by 2 scales: s,m,l factories</li> <li>▪ Request cost data factory, India and Brazil (cost of distillery from Brazil)</li> <li>▪ CEEEZ runs com models, IRR + CDM assumption</li> <li>▪ Policy issues</li> <li>▪ Technical scenarios-SADC Reg</li> </ul>
TR4	<ul style="list-style-type: none"> <li>▪ Circulate internally the outline (ext with indicators for action items)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Develop at least 1 indicator for each of the 3 subsectors of social, economic and environmental</li> <li>▪ Need land Area, employment, ecosystems values/nature</li> </ul>
WP15 (TR6)	<ul style="list-style-type: none"> <li>▪ Matrix with structure for data info from all countries</li> </ul>	<ul style="list-style-type: none"> <li>▪ SASA conference</li> </ul>
WP 16	<ul style="list-style-type: none"> <li>▪ Develop TOR for IS + contract the consultant</li> <li>▪ Diplomacy with SASA</li> </ul>	<ul style="list-style-type: none"> <li>▪ Obtain data for position paper</li> </ul>

**Coordinative action points:**

i) determine dates for second wkshp and who are co-chairs?

**Action Items for all:**

- TR-Outlines (+ structured)
- Sign membership agreements
- Agree the minutes within one month