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***Report from the SINCIERE Conference ***

Date: October 9, 2015

1. ***Summary***

**Conclusions**

*The SINCIERE Conference was successfully arranged on August 24-25, 2015. The goals of the Conference were satisfactory fulfilled. Important research findings and their relevance were presented, as well as the quality and strength of the bilateral cooperation. Experiences and recommendations for future cooperation were highlighted. It was emphasized that the CHINOR research projects had generated new issues needing further investigation. There is a need for improved follow-up towards governance issues to enhance relevance and facilitating impact and visibility of research findings. The Conference underlined the importance of establishing a stronger linkage between the RCN portfolio and the environmental governance project portfolio. The Conference was a first starting point in building a meeting place for scientists and policymakers, and representatives from the Environmental authorities and Ministry of foreign affairs were present throughout the arrangement.*

Environmental and Climate Research cooperation with China is going on at a substantial level, despite the political tensions. In general the importance of continued and strengthened cooperation was emphasized at the Conference. China represents a field laboratory allowing for the observation of effects of unprecedented pressures on the environment, with ample resources and large environmental datasets. This is turning China into the leading environmental research nation in the world.

China is a hot spot global polluter. How China deals with their environmental challenges has thus global consequences - not only due to the size, but also because China is showing the way for the developing nations. The Chinese government has the will and power to ensure a sustainable environment, though a prerequisite is knowledge. Spatial scales are inter-reliant, as solving a problem on a local scale may have co-benefits on the regional and global scale and vice versa. We need to be there and cooperate with our Chinese colleagues to produce the knowledge required to ensure a sustainable management of their environmental resources and ecosystem services. Shared knowledge for policy and mitigation strategies will be beneficial to both countries as well as the global environment.

The strong engagement by Norwegian scientists underlines the importance to strengthen research cooperation. Environmental research fields of great importance for China and Norway as well as globally, where we together have significant insight and expertise, should be prioritized. Particularly biogeochemical processes and effects on and by climate change as well as the linkage of East-Asian monsoons and Artic Oscillations should be noted.

In order to address issues of high societal focus and produce policy relevant knowledge the research needs to be interdisciplinary and across spatial scales from local to global. This opens for unique possibilities as Norway is very good on interdisciplinary environmental research, while China is comparably weak in this methodology.

***Project proposal guidelines***

**The Research Council of Norway (RCN):** China is one of eight prioritized countries. The International Strategy aims to pursue increased cooperation in science and in thematic areas of high relevance to Norway and China. The international strategy builds on mainstreaming of opportunities with all RCN-programs. (RCN: Roadmap for bilateral research cooperation; China).

* In 2016 following calls will be of relevance to increased cooperation; Miljøforsk, Klimaforsk, Energix and Marinforsk.
* Scholarships Norway-China (1st quarter for Norwegian applicants), 10 reciprocal exchange of students, PhD-students and researchers
* Specialist-guest scientists, reciprocal exchange up to 3 weeks. No deadline. Host country covers accommodation, home country covers travel costs.
* International Partnership for Excellent Education and Research (INTPART); fund partnerships between Norwegian higher education and research institutes and excellent partners in prioritized countries. Special emphasis on integrating higher education and research, may include business partners. INTPART will support established and/or further development of institutional collaborations. New call expected in 2016.
* CHINOR; planned dedicated call in 2015 cancelled. RCN considering pooling remaining CHINOR-funds into a larger thematic call during 2016.
* Horizon 2020; Mainstreaming of climate and sustainable development across the whole Horizon 2020. Encouraging cooperation with China in Societal Challenges (WP 2014/15; energy, agriculture, polar, water, waste, climate, ao). RCN may support implementation, influence on processes and calls for proposals, positioning and writing proposals.
* ERA-Net Co-fund mechanism; often to support Joint Program Initiative (JPIs); International cooperation beyond Europe often a priority (Climate, Water, Oceans, Energy, Biodiversity, Urban, Agriculture, Health. Norway participates in all ERA-Nets.
* Belmont Forum; research for global sustainability, both Norway and China are members. Joint actions with H2020 and JPIs. New calls expected in 2016

**The Ministry of Climate and Environment/The Norwegian Environment Agency** has special focus on cooperation with China. The cooperation is based on an agreement between The Chinese Ministry of Commerce (MOFCOM) and the Ministries of Climate and Environment (MEA and KLD). The aim of all projects is to strengthen the Chinese capacity on effective implementation of rules and policies. The project-portfolio is agreed in joint meetings with the Chinese authorities based on an agreed list of prioritized themes. They work together with the Norwegian Embassy in Beijing on prioritized projects. Proposals will primarily come from the Chinese side. There is no application system. Usually representatives from Chinese and Norwegian authorities within the climate and environmental sectors will have project-leadership. Science may be included when relevant. Norwegian scientists should contact the Norwegian authorities or the Norwegian Embassy for presenting ideas for future cooperation.

Prioritized areas:

* Air pollution and climate
* Hazardous substances
* Biodiversity

The Conference demonstrated that valuable contacts have been established with important partners in China. Cooperation with Chinese scientists offers entry to large resources and data-bases for renewed insight in complex matters. However, in China access to and sharing of data might be a sensitive issue.

The Conference also pointed out the need for merging or establishing closer contacts between several of the research groups to work together on larger interdisciplinary projects in order to build on a broader platform of expertise and knowledge.

In addition it was also recommended to build on and share already strong institutional contacts in China, to utilize the increasing number of Chinese scientists working in Norway as door openers to new contacts in China, and to draw upon the large Sino-Norwegian student alumni of Chinese students.

**Recommendations**

Continued research cooperation within Environmental and Climate research in general is recommended. This includes environmental disciplines such as biogeochemical processes and their effects on biodiversity and ecology by climate change and environmental contaminants. It also includes climate change studies in general as well as the effect on climate from pollutions and short lived climate forcers.

The CHINOR research projects have generated new insight and identified new issues needing further investigation. There is a need for improved follow-ups towards governance issues to enhance relevance and facilitating impact and visibility of research findings. From the science perspective issues regarding climate modelling and the need to study environmental and ecological issues in a more comprehensive way were highlighted.

Prime climatic topics are to understand the interference between artic climate and the monsoons in East Asia utilizing remote sensing, and the influence of short lived climate forcers on the climate as well as possible mitigation targets with short time effects.

Within environmental and ecological research, studying effects on air, water and soil by pollution and climate change, there is a need for joint catchment studies, thereby facilitating integration of data, allowing for a more comprehensive modelling.

Emerging thematic fields for future Sino-Norwegian cooperation is within Urban development and Energy strategies, both nationally as well as globally. This research needs to include environmental impact and climate change studies, as well as studies on societal and economic aspects.

Polar research could be an umbrella particularly related to air-pollution and climate studies, utilizing Svalbard as a platform for cooperation as both countries are present there. Aqua-Culture/Marine Science has a great potential for cooperation as well, utilizing the environmental understanding and capacity for the development of marine and coastal zone management.

The need for dedicated funds for this Sino-Norwegian cooperation were underlined in order to make sufficient progress, particularly keeping in mind the cultural differences and that patience and physical presence are needed in order to connect to the right people, build trust and relationships. Moreover, at the present political situation it may be a bit more difficult to furnace new collaboration compared to a normal situation. Dedicated funds will be very helpful in this situation.

Larger projects having longer project periods (5 years) and more continuity in thematic issues were recommended. However, it was also emphasized that support for cooperation-projects with China also should be sought within relevant RCN-programs as well as from EUs Horizon 2020 to mainstream the opportunities.

Management and policy impact of the research projects needs to be strengthened. This entails follow-ups towards governance and policy issues, enhancing relevance and facilitating impact of research findings. A greater involvement of Norwegian commerce with abatement technology, introducing the problem owner to problem solver, should be encouraged.

These elements are included in some of the projects presented, but the contacts to actors in China are individually established for the different projects, and there are no common learning and utilization of the same contacts.

It is therefore suggested that RCN establish a mechanism for strengthening the impact phase together with potential end-users both from the governance side as well as from industry. An existing mechanism that could facilitate a follow-up of the research projects is the environmental management aid program. The problem is that the priorities of projects financed by RCN and by the Ministry of Climate and Environment/The Norwegian Environment Agency are based on different criteria and different goals. This is causing a large divergence between the research project portfolio and the environmental governance projects, both with regards to themes chosen as well as facilitators. It is thus strongly recommended that RCN and Ministry of Climate and Environment/Environment Agency discuss how to proceed in establishing a better link between research activities and governance related activities to make sure a better visualization and ensure a greater impact of financial resources utilized in total. The Conference was intended as a first starting point in building such a meeting place for scientists and policymakers.

Finally it is recommended that the RCN utilize the remaining CHINOR-funds for positioning activities by pooling some of the previous CHINOR-projects to joint larger activities in a more systematic approach towards Chinese partners, identifying mechanisms for bringing in end-users from the governance side as well as industry.

***Highlights from the Keynotes and Introductory talks***

* Short lived climate forcers (Black Carbon, CH4, Tropospheric O3) plays increasing important role in global mitigation and strategies – reductions give immediate results – of benefit to the environment and health
* Understanding paleoclimate for our future: lessons from past warm climate increases our understanding of what to expect of today’s climate change
* The Acid rain project (IMPACTS, Integrated interdisciplinary environmental monitoring in 5 acid sensitive catchments) demonstrates what is needed for success; good financial possibilities, larger projects addressing the same issue in several localities, identifying useful models, critical data and involving local authorities at several places
* The Hg projects demonstrate the importance of good linkage between science and governance in a long term activity building up capacity in China.
* Airborne - human dimensions of air pollution in China in a historical perspective. How do people’s experiences and fears of air pollution transform into new visions of sustainability and creative forms of action?
* Air quality forecasting for mega cities - Wuhan my serve as an example on how to involve local authorities
* CIENS Urban- environmental issues in a multi-institutional perspective. How to create blue/green cities building on democracy, smart solutions and innovation? A model useful for China?
* CHINA has become the home to many of the world´s most polluted cities. Present growth is not sustainable. May we expect an energy revolution in China?
* The energy landscape in China and in Norway is quite different. Based on investments in secure and sustainable energy in both countries we have common interests in material sciences, CCS, system energy informatics, smart cities and energy policy and economics/ legal aspects

**About the Conference**

This interdisciplinary environmental and climate Conference was arranged in cooperation with the [Research Council of Norway](http://www.forskningsradet.no/no/Forsiden/1173185591033) (RCN). The Program is given at the SINCIERE home-page. The arrangement was supported by RCN.

The scientific platform for the Conference was the 15 CHINOR-projects presented and discussed in three parallel sessions: Climate modeling, effects and remote sensing; Sources of Greenhouse gasses; Environmental issues.  Important research findings and their relevance were presented, as well as the quality and strength of the bilateral cooperation. Experiences and recommendations for future cooperation were highlighted. This part of the program was enveloped by key-note lectures and talks about other major Sino-Norwegian research projects and their experiences from working in China.

All PowerPoint presentations are available from the SINCIERE homepage: <http://www.mn.uio.no/kjemi/english/research/projects/sinciere/>.

Around [80 persons](http://www.mn.uio.no/kjemi/english/research/projects/sinciere/sinciere-arrangements/SINCIERE-environmental-conference/deltakerliste-alfabetisk(1).pdf) of which around 20 Chinese living and working in Norway, attended the Conference. The participants represented the authorities, the Research Council and major research institutions within the environmental and climate field. In addition to the natural sciences the Conference had a broad representation from relevant institutions within social sciences and humanities.

The organizers wish to thank all the participants, speakers, chairs and rapporteurs for their contributions to the success of the Conference as well as for their substantial contributions to this report.

1. ***Conference report***
   1. ***Final discussion (Round table discussion)***

The final discussion (Round table discussion) was primarily between the Round table moderator and a Panel. This chapter builds on input from the rapporteur of the final session as well as the underlying reports and personal notes.

**The bilateral political problems are not a major impediment to research co-operation**

Research cooperation with China is going on at a substantial level. When relations are already established, they are not impacted by the political tensions. However, it may be a bit more difficult to furnace new collaboration as well as arrange larger more visible events particularly in China. Institutional building and participation by representatives at dissipation meetings etc. is very difficult. Ensuring stakeholder involvement and impact of research at high level is thus impaired.

At the moment there are no bilateral fora that are open for planning and financing joint calls or centers, as many other countries do with China. However, these other countries also experience strange impediments in their collaborations with China. There is sometimes a tendency to put too much emphasis on bilateral problems between Norway and China.

International research funding programs and fora such as H2020 or Belmont Forum often include Chinese participation and thus act in practice as joint calls also for Sino-Norwegian collaboration.

**Co-operation benefits Norwegian researchers**

The standing of Chinese researchers in co-operation with Norwegian researchers is becoming more equal so that the Norwegian scientists are clearly benefitting from collaborating with Chinese scientists. In particular, the Chinese research infrastructure is far larger, often much better and also cheaper to use than infrastructure in Norway. Some Norwegian researchers make use of this, to get more value for money.

This infers that the logic of dedicated development aid funds for research collaboration with China is becoming obsolete. Alternative Norwegian funding sources, e.g. the ministries of climate and environment, education or of industry and fisheries as well as other sectorial ministries, may be more relevant. Calls based on such funding sources will not carry a "China tag" but inclusion of Chinese partners is generally welcome.

There are also Chinese funding sources for Norwegian researchers, including from companies. In China, research is very instrumental. It means there are strong connections between research and industry. Research can also be instrumental in the social sciences, as politicians are very interested in studies of people's perceptions and worries ("ear on the ground").

Furthermore, despite that China is a large country, it should be noted that scientists have unique access to Chinese high-ranking politicians as many of them have PhDs and are scientists. It entails that they are more receptive to research. "Science diplomacy" with China should therefore be used more.

**What areas should Norway prioritize in environmental research co-operation with China?**

Environmental issues high on the Chinese agenda requiring knowledge generation within scientific disciplines where Norwegian researchers are strong should be prioritized. This includes biogeochemical response and its effects on biodiversity and ecology by changes in climate and environmental contaminants. It also includes biodiversity studies in general as well as environmental and ecological effects on climate change and climate systems. There are also economic sectors where the two countries can learn from each other through research, as in abatement and remediation technology, as well as environmental effects of aquaculture (and in the coastal zones) where both countries are large producers yet in different ways.

A steady course with continued research cooperation within established Environmental and Climate research is recommended. If new topics are to be included a highly relevant novel course for future cooperation seems to be Urban development and Energy strategies, at local to global scale, including mitigation and adaptation to environmental and climate change as well as societal and economic aspects.

Possible new focus areas may include:

Environmental effects of

* Urban and rural development under strong urbanization
* Energy production and transport (offshore wind, solar, CCS, oil and gas, nuclear)
* Short lived Climate forcers
* Process industry
* Material sciences (nanomaterials)
* Aqua Culture/Marine science

Environmental effects on

* Extreme events and climate change in polar regions, utilizing Svalbard as a research platform
* Health

All areas should be addressed in a multi/trans - disciplinary manner to utilize and enforce the scientific platform as well as the ability to address challenges of high societal focus.

**What is needed to build research collaboration?**

Patience and physical presence is required in order to identify the right partners, build Sino-Norwegian relationships and overcome cultural and linguistic barriers. Time spent in building relations is an important investment to achieve the trust needed to share ideas and join forces. Often, a typical 3-4 year project will be too short. Research centers (e.g. Centers of excellence – SFF) provide a more long-term and more institutional, less changeable "nursery" for such relationships.

There are an increasing number of Chinese researchers at Norwegian institutions: They can be of great help in building collaborative relationships, particularly in the first stages.

It is a matter of concern that the number of Norwegian students in China is declining, but it is not obvious which tools could amend the situation (for example, mobility grants for China are unused). As for receiving Chinese students at Norwegian research institutions, it should be observed that the existing financial schemes are underfinanced, not covering the host-institutions expenses.

**What challenges should Norwegian researchers pay particular attention to when seeking to collaborate with Chinese partners?**

In addition to the general cultural barriers to communicate, researchers should be aware that

* access to and sharing of public data can be a more sensitive issue in China than in Norway
* information flows are more hierarchical in China
* for innovation activities, intellectual property rights of foreign partners may not always be respected by Chinese partners
  1. ***Session reports***

The following reports are based on input from the session rapporteurs.

**2.2.1. Wrapping up from the science perspective**

More than 25 years of successful collaboration within environment and climate research was reported. This wrap up will sum up common reflections from each of the scientific parallel sessions and the plenary discussion. Important achievements, what we have learned and points for possible ways forward will be covered. More specific reflections are given under each scientific session report.

A broad specter of approaches and methods were presented, covering modeling, in situ monitoring systems, satellite monitoring, assessment of environmental status, local population interview, development of tools for decision making and increased process understanding.

**Important achievements**

In general scientific progress was reported in all areas presented, reflected by the large number of joint publications in international journals. The cooperation have also build up long term relations on personal and institutional level, and established contact with policymakers on local levels.

During the years, two-ways collaboration have developed based on increasing science investments and capability in China and competence sharing between the two countries.

**What we have learned**

* The most important success criteria are good science, mobility at all levels and activities based on inter/trans-disciplinary approaches, including natural and social science as well as observations and modeling.
* Arranging seminars or workshops, preferably in China, to get broader Chinese involvement are important tools. Important to meet in person to discuss possibilities, common interests and to ensure mutual progress.
* Challenges exist particularly related to information flow and access to data. And for new fields tofind the right people both at research institutions as well as within the authority units.
* It must be realized thatit takes time to build up a close collaborationand thatcultural and language understanding may represent barriers.

**Possible ways forward**

Both topical and organization elements should be considered, for continuity and to be built on existing contacts. Topically several options exist;

* Address future priorities both as climate and environmental issues related to air-pollution, water quality, biodiversity and hazardous substances
* Address societal/problem oriented topics as
* Urbanization studies
* Energy (Offshore wind, Solar cells, CCS, Oil and gas, Nuclear)
* Process industry
* Material sciences
* Health – including indoor pollution

Organizational elements for further discussion

* Setting up an organizational structure for long term collaboration (RCN, universities, institutes, industry) with tasks among others
  + Establish a low level Sino-Norwegian groups for developing common research projects, including educational component
  + Guidelines for Intellectual Property Rights (IPR) issues
  + Guidelines for/policy for data access and sharing
  + Establishing how center of excellence in Norway may include Chinese partners
  + Clarify the terminology – trans/inter/multi - disciplinary projects (may refer to http://ciens.no/media/1086/2\_2010.pdf)
* RCN to establish suitable financial measures as integrated in relevant RCN-programs as well as bilateral, dedicated means to support larger projects, positioning/up-starts, mobility and travel expenses and arrangement of seminars/workshops
  + InnovationNorway and Norwegian Embassy should continue their support for project development. Their portfolio should be communicated and, when appropriate, coordinated with the RCN portfolio.

**2.2.2. Session A: Climate modeling, Effects and Remote Sensing**

Four talks were presented related to 1. Advanced modeling and observations on solar radiation of Artic sea-ice, 2. Long range transport of black carbon and snow albedo in North-East China and in the Artic, 3. Satellite remote sensing of atmosphere/surface systems and ground truth measurements, and 4. Exploring decadal to century scale variability and changes in East Asian climate during the last millennium.

Themes discussed/ingredients; unique data/time series (instrumentation, research vessels, buoys), coupling models to observations/data important tool, satellite remote sensing (f. instance biosensors/phytoplankton, suspended materials, Yellow substances), utilizing the Bergen Climate Model, linkage between the East-Asian monsoons and Artic Oscillations

What have we learned? Calls should be topically open, not too narrow. Aim to identify possible synergies between the portfolios presented today to create larger projects with longer project duration (5 years)

Communicate in China in Chinese the need for research to policymakers and governance agencies.

Future research themes;

* Short lived Climate forcers (BC, CH4, O3, Aerosols,….)
* Teleconnection between SE Asian monsoons and the Artic
* Extreme events
* Artic Climate Change.
  + China will soon be the words largest on earth observations
  + Svalbard as a base for research collaboration, Kongsfjorden/Ny Ålesund large potential

**2.2.3. Session B: Sources of Greenhous gasses**

Five talks were presented related to 1. Sources of Greenhouse gasses in China, 2. Climate Change and Chinese agriculture, 3. Transforming China onto a low carbon pathway, 4. Designing effective emission trading and 5. Spatial planning and climate change.

Themes discussed/ingredients; Broad specter of Greenhouse gasses and their importance as climate forcers, China a major emitter and part of the solution, impressive quality of science development in China.

Chinese partners from different regions included.

What have we learned? Capability of effective progress through competence exchange. Questionnaires require top-down clarification.

Future research themes;

* Emission MRV (Measure, reporting and verification) systems - with special attention to validation issues
* Short lived climate forcers (SLCF) and co-benefit studies – Climate and Air Quality
* Implementation and governance of control mechanisms and measures

Needs; International agreements for communication and data exchange

**2.2.4. Session C: Environmental Issues**

Four talks presented related to 1. Air-surface exchange of organic pollutions and Hg in Chinese subtropical forests, 2. Adsorption to nanotubes, bioavailability and ecotoxicity to aquatic organisms of organic pollutions, 3. Watershed Eutrophication management in China based on system oriented process modeling and 4. Forests in South China as sink and hot spot for reactive nitrogen.

Themes discussed/ingredients; Environmental assessment and problem identification; Mapping. Monitoring, (air, water, soil,) basic data about state of environment, pollution source identification and magnitude. Tools (modelling) and DDS development. Increased biogeochemical process understanding. Should the focus be science cooperation or China as a laboratory?

What have we learned?

* Chinese partners have received important positions in management and policy – increased policy impact
* Air pollution is severe – sign of improvements. Coupling to Climate Change is uncertain.
* New environmental law in 2014, Water10plan 2015 underlines the importance of the presented themes in China.
* Norway recognized as good in interdisciplinary and environmental research. China is world leading in many academic disciplines (although weaker in environmental sciences)
* Norwegian scientists with good scientific CVs are attractive
* Hindrance; Access to environmental data
* Too much single researcher careers vs institutional long term cooperation

Future research themes / Recommendations

* Environmental research with China for mapping, monitoring and problem identification is still and increasingly important.
* RCN/MFA/Embassy; to continue bilateral research with focus on projects that solve real problems
* Include mitigation/co-benefit aspects and environmental education in the research projects
* Management and policy impact needs to be strengthened.
* Follow up of successful RCN projects - lack of mechanisms. Establish an impact phase with potential end-user value. Improve contact between KLD/environment Agency and the science community/RCN.