MARCO Workshop on Technology Development for Mitigating Greenhouse Gas Emissions from Agriculture

Date: 15-17 November, 2011
Venue: Epochal Tsukuba (Tsukuba International Congress Hall), Tsukuba, Japan

3rd Paddy Rice Research Group Meeting, Global Research Alliance on Agricultural Greenhouse Gases

Date: 18 November, 2011
Venue: Epochal Tsukuba (Tsukuba International Congress Hall), Tsukuba, Japan

Sponsored by: National Institute for Agro-Environmental Sciences (NIAES)
Supported by: National Agriculture and Food Research Organization (NARO)
Agriculture, Forestry and Fisheries Research Council, MAFF
Japanese Society of Soil Science and Plant Nutrition
Monsoon Asia Agro-Environmental Research Consortium (MARCO)
Global Research Alliance on Agricultural Greenhouse Gases (GRA)
Rationale for the MARCO Workshop:
Agriculture currently produces 14 percent (6.1 Pg CO₂eq.) of the world’s annual greenhouse gas (GHG) emissions, about the same as the transport or stationary energy sectors. Agricultural emissions of GHGs could increase to 7.9-8.5 Pg CO₂eq./year by 2050, as the agricultural sector seeks to meet an expected doubling of food demand. On the other hand, there are opportunities to reduce agricultural GHG emissions or promoting soil carbon sequestration through improved management technologies of agricultural lands and livestock production.

National Institute for Agro-Environmental Sciences (NIAES) and National Agriculture and Food Research Organization (NARO) are organizing a research project entitled “Development of Mitigation Technologies to Climate Change in the Agriculture Sector” together with other research institutes and universities in Japan. The project has accumulated scientific knowledge for mitigating agricultural GHG emissions by a series of process studies, field monitoring, and modeling approaches.

This Workshop aims at exchanging the results of the Japanese research project with invited foreign experts in order to help better understanding about the issues related to mitigation of agricultural GHG emissions. The workshop will be jointly organized by the Monsoon Asia Agro-Environmental Research Consortium (MARCO).

Rationale for the Paddy Rice Research Group Meeting:
This is the 3rd group meeting of the Paddy Rice Research Group of the Global Research Alliance on Agricultural Greenhouse Gases, which follows the 1st meeting last September in Tsukuba and 2nd one last March in France. As a result of the 2nd meeting, the group set a research plan including both immediate and long term activities. The group will review the activities since the 2nd meeting and discuss the ways of progressing its research plan.

Official Language:
The official language of the Workshop will be English. However, voluntary services of simultaneous translation for any monsoon Asian languages are welcome, in particular during the discussion sessions.

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MARCO Workshop on Technology Development for Mitigating Greenhouse Gas Emissions from Agriculture
15-17 November 2011, Tsukuba, Japan

PROGRAM

Tuesday, November 15

One day Excursion

09:10 Participants meet at the Okura Frontier Hotel Tsukuba Epochal
09:10 Leaving the Okura Frontier Hotel Tsukuba Epochal
09:30 National Institute for Agro-Environmental Sciences, in Tsukuba city
  - An introduction to the Institute
  - Natural Resources Inventory Museum
  - GHG monitoring facility and equipment
11:30 Return to the Okura Frontier Hotel Tsukuba Epochal
12:00 Lunch
09:10 Participants meet again at the Okura Frontier Hotel Tsukuba Epochal
13:40 Leaving the Okura Frontier Hotel Tsukuba Epochal
14:20 Horticultural Institute, Ibaraki Agricultural Center, in Kasama city
  - An introduction to the Institute
  - GHG monitoring field
15:40 Local agricultural area and mini-sightseeing
17:20 Return to the Okura Frontier Hotel Tsukuba Epochal
Wednesday, November 16  

at Epochal Tsukuba, Room 300

Scientific Symposium for Oral Presentations of Research

09:00  

Participant Registration

**Opening Session**  
*Chair: K. Yagi and A. Miyata*

09:30  

Opening address  
Kiyotaka Miyashita  
*President, National Institute for Agro-Environmental Sciences, Japan*

09:40  

Outline of the Workshop  
Kazuyuki Yagi  
*National Institute for Agro-Environmental Sciences, Japan*

**Keynote Lectures**  
*Chair: K. Yagi and A. Miyata*

09:50  

Management of agricultural soils for greenhouse gas mitigation: opportunities and challenges  
Charles W. Rice, Miguel Arango, and Ganga Hettiarachchi  
*Kansas State University, U.S.A.*

10:40  

Nitrous oxide mitigation in UK agriculture  
Robert Rees, John Baddeley, Anne Bhogal, Bruce Ball, David Chadwick, Michael MacLeod, Alan Lilly, Rachel Thorman, Christine Watson, and John Williams  
*Scottish Agricultural College, U.K.*

11:30  

Risk management of climate change and expectation of agricultural sector  
Taishi Sugiyama  
*Central Research Institute of Electric Power Industry, Japan*

12:20  

Group Photo and Lunch
**GHG Mitigation in Livestock Production**  
*Chair: A. Takenaka and A. Ogino*

13:30 The possibility of controlling flow of hydrogen into methane production and alternatives in the rumen  
Makoto Mitsumori, Osamu Enishi, and Takumi Shinkai  
National Institute of Livestock and Grassland Science, NARO, Japan

14:00 Methane production and mitigation from ruminant livestock in Thailand  
Kritapon Sommart, Chatchai Kaewpila, and Akio Takenaka  
Khon Kaen University, Thailand

14:30 Evaluation for greenhouse gas emission from slurry storage of dairy cattle  
Takashi Osada and Keiko Minato  
National Institute of Livestock and Grassland Science, NARO, Japan

15:00 *Coffee Break*  
**POSTER PRESENTATION** at the corridor: Results of Research Project: “Development of Mitigation Technologies to Climate Change in the Agriculture Sector”  
*Chair: T. Osada and A. Takenaka*

15:30 Mitigating strategy of greenhouse gas emission from dairy manure composting process  
Kouki Maeda, Sakae Toyoda, Dai Hanajima, Riki Morioka, Naohiro Yoshida, and Takashi Osada  
National Agricultural Research Center for Hokkaido Region, NARO, Japan

16:00 Nitratation promotion process for reducing N$_2$O emission from swine manure composting  
Yasuyuki Fukumoto  
National Institute of Livestock and Grassland Science, NARO, Japan

16:30 Reduction of greenhouse gas emissions from livestock manure management by feeding low-protein diet  
Akifumi Ogino and Takashi Osada  
National Institute of Livestock and Grassland Science, NARO, Japan

17:00 Adjourn

18:00 *Workshop Reception*  
*at Café “berger”*
GHG Mitigation in Croplands  

Chair: N. Koga and A.W. Kishimoto-Mo

09:00 Effect of manure application on greenhouse gas emissions from managed grasslands in Japan

Mariko Shimizu, Ryusuke Hatano, Takatoshi Arita, Yasuyuki Kouda, Akinori Mori, Shoji Matsuura, MitsuihiroNiimi, Masayoshi Mano, Ryuichi Hirata, Tao Jin, Attfriedy Limin, Osamu Kawamura, Masayuki Hojito, and Akira Miyata
Hokkaido University, Japan

09:30 Characteristics of soil carbon sequestration and CO₂ emission from arable land of China based on long-term experiments

Minggang Xu, Xubo Zhang, Wenju Zhang, Yilai Lou, and Hui Li
Institute of Agricultural Resources and Regional Planning, Chinese Academy of Agricultural Sciences, China

10:00 Simulating soil organic carbon stock change in Japanese agricultural land with the RothC model

Yasuhito Shirato and Yasumi Yagasaki
National Institute for Agro-Environmental Sciences, Japan

10:30 Evaluation of technologies for sequestering carbon by using organic filter underdrains

Iwao Kitagawa, Yasutaka Tsukamoto, and Satoshi Nakatsu
National Institute for Rural Engineering, NARO, Japan

11:00 Fallow management alters plant species composition and soil carbon profile after cessation of cultivation

Seiji Shimoda
National Agricultural Research Center for Western Region, NARO, Japan

11:30 Effects of the partial cooling on tomato (Solanum lycopersicum) with the method of the undersurface heat exchange

Shohei Shibata, Teruo Hidaka, and Johshin Tsuruyama
National Agricultural Research Center for Western Region, NARO, Japan

12:00 Lunch
GHG Mitigation in Paddy Fields  

Chair: O. Nagata and T. Fumoto

13:00 When should mid-season aeration begin and nitrification inhibitor be applied to reduce CH4 and N2O emissions from rice fields
   Hua Xu, Jing Ma, Xianglang Li, Guangbin Zhang, and Kazuyuki Yagi
   Institute of Soil Science, Chinese Academy of Sciences, China

13:30 Effects of surface drainage during fallow seasons on mitigating methane emissions from poorly-drained paddy fields in Japan
   Yutaka Shiratori and Yuichiro Furukawa
   Niigata Agricultural Research Institute, Japan

14:00 Greenhouse gas emissions from Indian rice paddies using DNDC model
   Jagadeesh B. Yeluripati, Steve Frolking, Changsheng Li, Dali Rani Nayak, and T.K. Adhya
   University of Aberdeen, U.K.

14:30 Nation-scale estimation of methane emission from paddy fields in Japan using a biogeochemistry model
   Michiko Hayano, Tamon Fumoto and Kazuyuki Yagi
   National Institute for Agro-Environmental Sciences, Japan

15:00 Coffee Break
   POSTER PRESENTATION at the corridor: Results of Research Project: “Development of Mitigation Technologies to Climate Change in the Agriculture Sector”

15:30 Mitigation of greenhouse gas emission from paddy fields (provisional title)
   Tapan K. Adhya
   Central Rice Research Institute, India

General Discussion Session  

Chair: K. Yagi and A. Takenaka

16:00 Summary presentations for key categories of research targets

16:20 Discussion by all participants

16:50 Closing remark

17:00 Adjourn
## AGENDA

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<th>Session</th>
<th>Presenter / Moderator</th>
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<td>0900</td>
<td>Opening:</td>
<td>Kaz Yagi, Alvaro Roel, Akihiko Uchikawa</td>
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<td>- Welcome addresses</td>
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<td>- Participants’ self-introductions</td>
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<td>- Overview of the Paddy Rice Research Group</td>
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<td>- Review of decisions made by the 2nd group meeting at Versailles (March 2011)</td>
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<td>- Review of today’s Agenda and Objectives</td>
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<td>0930</td>
<td>Overview of the Alliance:</td>
<td>Deborah Knox</td>
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<td>- Review of Ministerial Summit and Council meeting (Rome, June 2011)</td>
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<td>- Membership</td>
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<td>- Communications policy development</td>
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<td>- Policy on partnership</td>
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<td>- Other Research Group activities</td>
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<td>- Upcoming milestones</td>
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<td>0930</td>
<td>Brief reports for research update in each member country</td>
<td>Delegates from member countries (maximum 10 min presentation)</td>
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<td>- Stock-take for paddy rice research</td>
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<td>- Recent research activities</td>
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<td>- Priorities of research needs</td>
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<td>1030</td>
<td>Coffee break</td>
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<tr>
<td>1100</td>
<td>Brief reports for research update in each member country (continued)</td>
<td>Delegates from member countries</td>
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<td>1230</td>
<td>Lunch - Venue TBD; each participant responsible for paying for his or her own meal.</td>
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<td>1330</td>
<td>Action Plan discussion:</td>
<td>Moderated by Kaz Yagi</td>
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<td>- Standardization of measurement techniques</td>
<td>Presentations by: Kazunori Minamikawa, Shigeto Sudo</td>
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<td>- Databases for publications and experts</td>
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<td>- the future of the stocktake</td>
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<td>- Longer term action: an experimental protocol for a pilot multi-site/country experiment</td>
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<td>1500</td>
<td>Coffee break</td>
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<td>1530</td>
<td>Linking to the other Research Groups and cross-cutting issues</td>
<td>Moderated by Alvaro Roel</td>
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<td>- Reports for the activities of other groups</td>
<td>Reports: Participants from other groups</td>
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<td>- Discussion</td>
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<td>1600</td>
<td>Linking with partners and resource persons</td>
<td>Moderated by Alvaro Roel</td>
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<td>- Reports from partners and others</td>
<td>Reports: Participants from partners, etc.</td>
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<td>- Discussion</td>
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<td>1630</td>
<td>Future activities:</td>
<td>Kaz Yagi</td>
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<td>- Next steps to implement the Action Plan</td>
<td>Alvaro Roel</td>
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<td>- Upcoming milestones</td>
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<td>1700</td>
<td>Meeting close</td>
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