# Table of Contents

Introduction........................................................................................................................................................................ 3  
Goals and Objectives ............................................................................................................................................................ 3 
Pre-workshop Activities.......................................................................................................................................................... 3 
Opening Remarks and Expectations .................................................................................................................................... 4 
Day 1: Overview of Regional Project Plans .................................................................................................................... 4 
Day 2: Detailed Discussions of Climate, Cropping Systems, Economics, and IT Goals and Round-robin Discussions ............................................................................................................................................. 5 
  Round-Robin on Collaboration, Management, and Outputs.......................................................................................... 6 
  Round-robin on Economic Data, Modeling and RAPs ................................................................................................. 7 
  Round-robin on Crop Data and Modeling ....................................................................................................................... 8 
  Round-Robin on Climate Data, Modeling and Scenarios ............................................................................................ 9 
Day 3 and 4: AgMIP Protocols and Integrated Assessments .......................................................................................... 9 
  Climate and IT Team Activities ................................................................................................................................. 10 
  Crop Modeling Team Activities ............................................................................................................................... 10 
  Economic Modeling Team Activities ......................................................................................................................... 10 
Day 5: Planning Work within Project Teams and Timelines .......................................................................................... 11 
  Timelines ............................................................................................................................................................................. 11 
Appendix I: AgMIP-SA: Identified Issues Relevant Across the Different Project Teams ............................................ 12 
Appendix II. Workshop Agenda and Detailed Program ............................................................................................... 14 
Appendix III. Participants for the First AgMIP South Asia Workshop on Integrated Regional Coordination in Colombo, Sri Lanka, 12-16th November 2012. .................................................................................. 20
Introduction
The Agricultural Model Intercomparison and Improvement Project (AgMIP) is a major international effort linking the climate, crop, and economic modeling communities with cutting-edge information technology to produce improved crop and economic models and the next generation of climate impact projections for the agricultural sector. AgMIP aims to utilize inter-comparisons of various types of methods to improve crop and economic models and ensemble projections and produce enhanced assessments by the crop and economic modeling communities researching climate change agricultural impacts and adaptation. The South Asian Regional Coordination team is working towards enhancing the capacities of regional teams of South Asia.

Goals and Objectives
The “Enhancing Capacities of the AgMIP South Asia Regional Teams through Capacity-Building Workshops and Knowledge-Sharing Platforms” project capitalizes on the partnership between the Agricultural Model Intercomparison and Improvement Project (AgMIP) and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). This Workshop is organized to help coordinate AgMIP Research Teams and facilitate compatible integrated regional assessments of climate change impacts and adaptation in selected agricultural systems. The workshop, organized by the South Asia Regional Coordination Team (RCT) and by the AgMIP Leadership Team aimed to:

1. Build capacity of the multi-disciplinary Research Teams throughout the region to prepare integrated assessments of climate change impacts and adaptation and
2. Design workshops, in collaboration with the AgMIP Leadership Team, to publish the results of the integrated assessments that each Research Team has put together during the project.

The goals of the workshop conducted are to build cohesiveness within and among regional AgMIP teams to achieve success across each region, consider stakeholders’ concerns and needs, review and refine protocols for AgMIP regional integrated climate change assessments, conduct training on AgMIP integrated assessment methods and tools, develop specific plans for carrying out AgMIP integrated assessments during the project, and develop a timetable for incrementally writing material such that the assessments are ready by the end of the project.

Pre-workshop Activities
The SA coordination team has done the following pre-workshop activities:

- The regional research teams were informed and advised on how to organize their own internal meetings so as to meaningfully prepare for the workshop. For example, some of the topics for discussion would be on how to develop an inventory of available data and sources of data that are needed for regional assessments (weather, site experiment, soil, and socio-economic parameters); how to prepare these details so as to present them appropriately at the workshop; how to identify the IT goals of the project (data management plans, project website, etc.); how to prepare a summary of their crop and economic model analysis that have either been done or are underway in the region; how to identify the team members who should be in each of the AgMIP teams (climate, crop, and economic modeling, and IT); and finally, how to identify key stakeholders who are suitable for participating in the workshop.

• Initiate activities to accomplish what is needed for the SA-wide workshop;
• Develop an inventory of available Knowledge-Sharing Platforms that are needed for capacity building of regional AgMIP teams;
• Select regions, study sites and teams that are to be targeted, and prepare a summary of each to discuss in the first workshop; and,
• Different opportunities to build capacity of the multi-disciplinary research teams throughout the region to prepare integrated assessments of climate change impacts and adaptation.

A two-page synthesis highlighting key aspects including training needs and areas for collaboration/synergy across teams is appended (Appendix I).

The pre-workshop activities thus ensured that knowledge platforms were well in place to augment the participation in the SA-wide meeting. The agenda for this workshop is contained in Appendix II and the list of participants in Appendix III. There were 77 participants including 13 from AgMIP leadership team, 8 from South India, 6 from Pakistan, 13 from the Indo-Gangetic Plains, 8 from ICRISAT, 22 from Sri Lanka and 2 from IWMI. Five participants were stakeholders. See Appendix III for details of individuals.

Opening Remarks and Expectations
Dr. Dileepkumar from the International Crops Research Institute for the Semi-Arid Tropics and PI for the South Asia Regional Coordination Team welcomed the delegates, especially all members of the SA region and other AgMIP members and underscored the following important aspects:

• Incorporate state-of-the-art climate products as well as crop and agricultural trade model improvements in coordinated regional and global assessments of future climate impacts to improve decisions and policies.
• Include multiple models, scenarios, locations, scales, crops, and participants to explore uncertainty and impact of data quality and methodological choices.
• Collaborate with regional experts in agronomy, economics, and climate to build strong basis for applied simulations addressing key climate-related questions.
• Improve scientific and adaptive capacity for major agricultural regions in the developing and developed world.
• Develop framework to identify and prioritize adaptation and mitigation strategies.
• Link to key on-going efforts.

During the session, Cynthia Rosenzweig (NASA GISS), Jim Jones (University of Florida), and Jerry Hatfield (USDA-ARS, Ames, Iowa), gave a presentation on AgMIP, its various activities and also briefed about the 5-day workshop. They mentioned that the growing agricultural risks, as a result of climate change, call for a consistent approach to enable the agricultural sector across relevant scales and disciplines.

Day 1: Overview of Regional Project Plans
The South Asia Regional projects Kickoff Workshop started with a welcome address from Dr. Dileepkumar Guntuku. Dr. Cynthia Rosenzweig and Dr. James W. Jones explained the overview of workshop goals and introduced AgMIP and South Asian
Regional Research Teams followed by brief introductions of stakeholders, participants and representatives from the media.

Each regional project team presented their project proposals and goals. Later the Regional Research Team Breakout sessions were organized to discuss the anticipated challenges, areas of concentration, and training requirements.

Further, discussion went on the various Regional Projects in South Asia on integrated analysis of food production systems with a focus on climate contribution to food insecurity with the projects being implemented in Pakistan, the Indo-Gangetic plain, Southern India, and Sri Lanka. For capacity building, it suggested to plan, coordinate, and organize workshops to build capacity for the AgMIP regional climate assessments and guide the projects. This discussion was concluded by emphasizing on coordination, capacity building, and knowledge sharing, giving examples of KSI Connect, AgED Open Course Ware, and Open Access Repositories.

Harvir Singh from IGB explained that the challenge is to focus on crop modeling, keeping in mind integrated farming like livestock. He discussed the challenges in approaching an integrated farming system keeping in mind the time frame. Achieving it at present is quite a task but the broader picture must be kept in view without losing track. The present challenge is to revise the activity mileage stance at regional and global levels to achieve an integrated farming system within a given time. Capacity building programs are to be conducted in collaboration with the partners to bring in an equal footing of understanding among partners on the different models.

The workshop was a good opportunity for cross-team understanding and sharing of ideas and identifying areas of collaboration. There were also discussions on the need to build regional scenarios that are consistent with global scenarios based on “shared social economic pathways” (SSPs). This arose from a presentation on integrated assessments made by Dr. John Antle that cut across the methods, outputs, and framework for integrating across climate, crop, livestock, economic, and IT teams as well as scaling up aspects. It was insisted to use TOA-MD in AgMIP regional projects because it provides a parsimonious, generic framework to assess impacts.

**Day 2: Detailed Discussions of Climate, Cropping Systems, Economics, and IT Goals and Round-robin Discussions**

Jim Jones and John Antle introduced the agenda of the day. John Antle (AgMIP Global Economics Co-Leader) discussed about Representative Agricultural Pathways, explaining RCPs, SSPs and RAPs, their key issues and implementation. The participants, guided by the AgMIP leadership team, discussed on the best strategy to deliver outputs through a proof of concept based on one or two selected sites rather than multiple sites in the region for enabling fast track analysis. Long-term climate data and one future climate scenario will be used (simplest possible cases), running this for a number of sites to capture variability within the selected sub-region. This first set of runs is to evaluate impact of climate change on productivity and poverty levels, and results should include for example % gainers and losers. The idea is that participants go through the whole sequence of the integrated regional assessment using one sub-region/site. This should include also developing RAPs and looking at adaptation. The timelines set for the proof of concept activities is reported under timelines.
Round-robin discussions were scheduled ensuring that each of the RRTs spent time with AgMIP leadership to discuss collaboration, management, and outputs with IT, economics, and crop modeling experts to discuss relevant issues for the teams. The key aspects in each of these sessions are highlighted:

**Round-Robin on Collaboration, Management, and Outputs**

The purpose of these sessions was to build an understanding within teams on the expected timelines and reporting and training within teams and within the SA region. The following are the key issues discussed:

1. Synergies between different teams can be achieved through additional SA-wide training workshops addressing specific needs. Participation to these workshops should be restricted to only those persons that needed the specific capacity. Regional teams were requesting capacity building in the area of crop modeling, TOA-MD and climate modeling.

2. Dr. Cheryl Porter intimated to the regional teams that AgMIP website is being fine-tuned and includes public facing pages and AgMIP tools for integrated assessments. It was noted also that through the developed IT tools, modelers will be able to download datasets directly into the format they need, be it DSSAT or APSIM.

3. The functioning of data node was explained to each of the research teams. The Regional Coordination Team has expressed interest for hosting all the datasets of the region initially at ICRISAT. Data will be tagged depending on whether it is freely accessible or restricted. Different license types will be used as applicable. Also, standard formats for data arrangements are prepared for uploading climate, crop, and economic datasets into the database.

4. Since not all IT tools for data conversions are ready (climate tools, crop model data translation tools, web and desktop interfaces for modeling tools), teams will be informed as to when the IT tools are developed. Similarly, teams are encouraged to share training protocols and other methodologies if they develop any.

5. Revised timelines were requested due to the delayed program funding. Important reporting periods were determined (including March 2013 and February 2014). These will be enforced even if there is a project extension. Teams are requested to prepare the report as per the AgMIP protocols. The reporting will be more of methodologies, protocols, and abstracts.

6. For connections within projects (Climate-IT-Crop-Economics), tools are being developed for reporting in a standardized way. This is to ensure that data from each discipline are easily understood and usable by the other disciplines.

7. Plans for upcoming workshops were noted: all the proposed workshops will be organized in a common place which is mutually agreeable to all the teams. Nepal and Sri Lanka are identified as the potential places for future workshops.
8. Connections with the coordination team and AgMIP resource persons were explained in terms of communication and training workshops. For communication, each RRT will maintain communication within its members while the coordination team will ensure communication across teams. A number of listserves will be maintained for communicating with different groups. Each team is suggested to identify an individual as a point of contact for each domain (climate, crop, and economic modeling). The coordination team plans to send out updates every two weeks to the teams.

**Round-robin on Economic Data, Modeling and RAPs**

In this round-robin session, the economists in each RRT had detailed discussion with the AgMIP economic team consisting of John Antle, Roberto Valdivia, and S. Nedumaran (Regional expert in TOA_MD).

Each RRT selected one or two economists and they underwent a basic online training on TOA_MD model to understand the structure and the basic data requirement to construct the TOA model. Some RRTs are well versed with the TOA and some RRTs like the Pakistan, Sri Lanka, and Nepal economists were just introduced to the TAO_MD model training and they need still more hands-on training to start working in the TOA model.

The economists in each RRT explained the household survey data availability in each study site and discussed about the agricultural system and parameters needed to build the systems. The team discussed on the selection of crops and system for each of the study sites for the “fast track” study and the data required for running the crop model was discussed in detail.

In the round-robin discussion, the economists discussed how the crop model simulations can be used in TOA_MD to implement assessment of climate change impacts. The steps involved in characterizing the System 2 using the crop model simulation for climate change assessment was also explained. The household survey data in study regions does not have sufficient weather and soil data to run the crop model for each farm in the study region. For this unmatched data case, the minimum data required to extract from the farm survey was discussed with economists. The economists agreed to develop this minimum data from the survey information and share with the crop modelers to run the crop simulation for the representative farms.

The teams discussed and selected the site for constructing the fast track integrated assessment exercise. The economists will provided the necessary information like location of the farm site, crop management (date of sowing, fertilizer applied, irrigation, etc.), and farm yields to the crop modelers to run the simulation.

The rationale was to demonstrate the process of developing scenarios, get an understanding of the economics modeling and their data needs, and of how to develop representative agricultural pathways (RAPs). The reason for developing RAPs was explained as the need to look at socio-economic variables that influence climate change. In developing RAPs, stakeholders need to be involved. RAPs were defined as having qualitative story lines while scenarios have quantitative story lines. Participants expressed the need to distinguish between scenario analysis and RAPs, and also spend a lot more time on the TOA-Model.
Round-robin on Crop Data and Modeling

Dr. Ken Boote delivered a talk on “Scaling up Crop Model simulations to districts for use in Integrated Assessments: Case Study of Anantapur District in India”. During his presentation, he explained the activities needed to be done by each regional crop modeling team. In summary, he explained how to calibrate the Sentinel Site Experimental Data, the prediction of district level yields, and how to do bias adjustment and the various steps for Scaling up Crop Model Simulations for Region.

- Collect district-level historical yields and de-trend.
- Determine range of distribution of soils, weather stations, sowing dates, fertilization, and soil organic carbon for the region.
- Simulate district-level yields over the range of distributed inputs and compute simulated mean yield per year.
- Aggregate and plot observed district-level yields (per year) versus simulated mean annual yields. Compute bias (ratio or slope with zero intercept).
- Simulate with baseline and climate scenarios, using distribution of weather sites, soils, and management inputs.
- Crop model outputs to economic models to simulate for same regions, with management inputs and economic cost inputs.

The Parallel Breakout Round-Robin Sessions were organized separately for crop modeling, climate and economic teams from each regional project team. The crop modeling breakout sessions were represented by K. Boote, J. Hargreaves, C. Porter, P. Singh, and Dr. Nedu as resource persons and they met crop modeling experts of each team. They discussed the crop models they are using, level of expertise, and training requirements. Each team explained in detail their proposed activities, crops they are going to study, and training requirements. The kind of data needed was explained; this included planting date, planting density, and fertilizer application. A detailed account of data requirements for modeling is contained in a DSSAT book that was provided to crop modelers (through RRT PIs) during the workshop.

Fast track calibrations for selected regions/sub-regions suggested using 2-3 varieties, days to anthesis and days to maturity as the most important. Absolute yield comes out in the bias correction (further studies required). Varieties differ from local to OPV to hybrids, and variety trial datasets are important for the calibrations. For coarse calibrations, weather and soil may have more influence than the variety.

The role of local experts (e.g. agronomists & soil scientists) in helping to make good assumptions on soil initial conditions, soil characteristics, fertilizer use, irrigation, etc. was emphasized. All assumptions should be clearly and rigorously documented—both to identify weaknesses in exercise, and so that if additional data are obtained, they can be used to replace the assumptions and improve the exercise.

Many of the crop modelers required an understanding of what RAPs really are and whether they need to work with economists to produce crop-modeling output for the RAPs. There are problems in getting survey data and many groups expressed survey data lacks information required to run crop model, which requires a lot of assumptions. Many centers even have problems with quality weather data. There is no systematic approach for filling gaps beyond expert opinion. AgMIP’s climate team assured they
would fill the missing data based on their models. For fast track analysis all the teams should send the study areas with available weather data, so that the climate team will be able to do the gap filling and also send the one scenario data for future climate. Dr. Jones delivered a lecture on bias correction for comparing model output and actual yield data.

**Round-Robin on Climate Data, Modeling and Scenarios**

Teams expressed the challenge in acquisition of climatic data from Agro-Meteorological Stations in host countries. The climate team within AgMIP (led by Alex Ruane) can generate weather data if longitudes and latitudes data are provided for specific sites, but usually this data is not as good as that obtained from the stations directly. Other aspects discussed in this round-robin session are highlighted below:

- Coordinates of locations selected for simulation and for which no reliable climate data is available should be sent to Alex Ruane in order to obtain a climate dataset in the AgMIP format.
- Baseline (historical data) weather information is needed for each of the sentinel sites for the period of 1980–2010 (i.e. for each region, identification of historical time series is needed).
- The quality of data (including that from station observations) needs to be checked for biases. Procedures to follow are well elaborated in the draft Guide for Regional Integrated Assessments. Different approaches to data quality control and how to fill in missing data were discussed. This includes adjusting and correcting for:
  - Number of rainy days.
  - Rainfall distribution.
  - Rainfall and temperature means to match the observed data records.
- Use of other data sources like IMD data to supplement for the missing data.
- Conversion of the climate data into DSSAT and APSIM compatible formats.
- Highlight of production of future scenarios for each crop modeling.

**Day 3 and 4: AgMIP Protocols and Integrated Assessments**

The teams were grateful for the round-robins as these provided a lot of insight and provided answers to issues within and across the teams. Areas needing further attention/elaboration were suggested and include:

- Emphasis should be on capacity building in crop models and each team is expecting only one model. Scenarios and their development since this is a new topic. Materials/supportive documents on this topic are needed.
- Need for practical sessions on the use of R for climate data analysis.
- Regular meetings with the stakeholders to identify the actual requirements.
- Clarity on some concepts including the many acronyms employed in AgMIP protocols such as SSPs and their association with RCPs and RAPs.
- Examples with climate, crop, and economic modeling applications.
- As most of the teams are working on rice crop, a separate DOME for rice needs to be prepared immediately.

There were discussions about importing and translating crop model data and AgMIP’s harmonized data bases with examples. Also discussed about the need to address
broader issues associated with climate change at regional/global scales, regional scale impact and adaptation research, and scaling from point/field to regional scale.

**Climate and IT Team Activities**

Alex Ruane presented AgMIP climate team activities for regional integrated assessments. The team described their tasks in support of AgMIP RRT which include characterization of the climate in the region (to identify the unique characteristics or climate zones), and baseline climate series for each crop-modeling location. The IT team provided an overview of their tools for importing and translating crop model data including finished products and those in the works. This included information of how to access the tools and data sets online. Steps to data preparation and translation were demonstrated as well as different ways to input/upload and download data into the database. Participants were also provided with a newly developed user interface (QuadUI) for use as desktop application for data conversions.

**Crop Modeling Team Activities**

On the 3rd day, the crop modeling team had a hands-on exercise on integrated assessment tools, use of QuadUI, DOME, etc. Machakos Centre data was used for the hands-on exercise and also had a lecture from Dr. Jones on bias correction and related topics. Dr. Cheryl Porter explained importing and translating crop model data using data translators. After the exercise, each regional team presented their proposal for fast track analysis.

On the 4th day after a successful breakout session, each team presented their integrated assessment plans for the fast track analysis:

**South India Team**
Crops: Rice (Tamil Nadu, Maize - Andhra Pradesh)
Require training in APSIM

**Sri Lanka**
Crops: Rice, Sugarcane
Require training in DSSAT and APSIM

**Indo-Gangetic**
Crops: Wheat
Require training in DSSAT

**Pakistan**
Crops: Rice
Require training in DSSAT and APSIM

The South Asia Region Coordination, Capacity Building and Knowledge Sharing team assured to arrange required capacity building activities in the crop modeling aspects to the required regional teams. The team also suggested the regional team to aim for few publications in peer reviewed journals.

**Economic Modeling Team Activities**

The global economic group explained the step-wise process involved in the development of RAPs using the inputs from relevant stakeholders including those from
the crop model and climate teams. They also explained how to translate the story line which include qualitative and quantitative information into plausible ranges of quantitative values for the parameters in the TOA-MD model. The team also explained to RRTs the Excel sheet tool called **DevRAP**, which is used to facilitate the development of RAPs. This tool provides a structure to guide the RAPs development process and to record and document the information systematically during the RAPs meeting with stakeholders. The economists also got a hands-on training to construct the RAPs using the tool. The economists from each RRT did an exercise in developing RAPs for a particular case study region by involving the other team members and they presented and discussed with the global economic team members.

**Day 5: Planning Work within Project Teams and Timelines**

Each of the project teams had enough time to sit together and plan their work especially for fast track activities. The activities were planned with the agreed timelines in mind. The research plans for each of the teams are already uploaded in the [AgMIP CONNECT website](https://www.agmip.org).

**Timelines**

The agreed timelines towards the delivery of the proof of concept and other SA-wide activities is shown below. It was cautioned that fast track should not be a reason to slow down on other aspects of the outputs by the RRTs. The following are the revised timelines.

---

**AgMIP South Asia Regional Projects Timeline**

<table>
<thead>
<tr>
<th>Task</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kickoff workshop – Colombo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stakeholder interaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fast-track – Climate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fast-track – Crop model calibration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fast-track – Economic survey and model calibration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fast-track – Crop model simulations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fast-track – Analysis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calibration of additional integrated assessment sites</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calibration of additional sentinel sites for crop models</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic Model Training Workshop</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd South Asia Projects Workshop</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simulations and analysis of all sites</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality control and revised simulations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th AgMIP Global Workshop</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connecting analyses across sentinel sites and assessments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final report preparation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final South Asia Projects Workshop – Writing</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix I: AgMIP-SA: Identified Issues Relevant Across the Different Project Teams

AgMIP project teams provide unique opportunities for:

1. Enhancing the capacities in the areas of climate, crops, and economics modeling of South Asia Teams.
2. Adding value to available data and information. No field experimentation, no farmer surveys for data collection, etc. are envisaged.
3. Drawing valuable conclusions by using already available datasets.
4. Providing a platform to interact and work in close collaboration with global experts.
5. Bringing visibility to the work in the region through sharing of experiences nationally, regionally, and globally.
6. Enhancing regional capacity through improved skills in use of tools.
7. Helping policy makers in understanding the climate change impacts by preparing farming community to face climate change challenges.
8. Developing adaptive strategies based on the results obtained in this project for sustaining crop yields.

Common challenges

1. Availability and access to data, especially climate data (temperature and radiation). Farm survey data needed for economic models.
2. Interactions among groups: thematic teams must work in close collaboration. Inter-country interactions are needed. This could point to a need for development of clear intra-project communication strategies. Each team comprised of individuals already engaged in various other activities. So regular contact is a big challenge. Communication problems with some countries because of Visa issues.
3. Reliance on existing datasets. Cannot conduct new experiments to acquire data as required for calibration and validation. Accessing already available datasets such as crop yields and genetic co-efficient is a big challenge because it needs formal permission from the authors/agricultural universities/ICAR. Even getting climate datasets from IMD is difficult and requires a lot of ground work and is time consuming. For generation of climate datasets including filling in missing data, it may be best to use similar/consistent approaches across teams.
4. Need for clear information strategy for data sharing within and across teams. ICRISAT has promised to work out a common platform for storing data of Regional Research Teams of South Asia.

Capacity building needed

5. Training on new AgMIP tools for all the regional teams, as the training given during this workshop was not sufficient. Also, training in R for climate data analysis, suggested by all regional research teams.

6. IGB, Pakistan, and Sri Lanka teams require immediate training on DSSAT model and South India and Sri Lanka teams require APSIM training.

7. South India (AP) and Sri Lankan teams need refresher on TOA-MD Model.

Opportunities for reaching stakeholders
8. Initial ideas for publications to reach out different target groups have been identified and planned as shown below:

<table>
<thead>
<tr>
<th>Target groups</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers</td>
<td>Stakeholder’s workshop, Focus group meetings, Publication in regional languages.</td>
</tr>
<tr>
<td>Fellow Researchers / Students</td>
<td>Scientific publications in peer reviewed journals, Arranging capacity building workshops.</td>
</tr>
<tr>
<td>Policy makers</td>
<td>Status reports, Fact sheets</td>
</tr>
</tbody>
</table>

**Target crops**

<table>
<thead>
<tr>
<th>Sri Lanka</th>
<th>South India</th>
<th>IGB</th>
<th>Pakistan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>Rice</td>
<td>Wheat</td>
<td>Wheat</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>Maize</td>
<td>Rice</td>
<td>Rice (Fine)</td>
</tr>
<tr>
<td></td>
<td>Groundnut</td>
<td>Maize</td>
<td>Cotton</td>
</tr>
<tr>
<td></td>
<td>Sorghum</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Suggested models**

Most teams mentioned DSSAT, APSIM, Info-Crop and TOA-MD.
Appendix II. Workshop Agenda and Detailed Program

## AgMIP Sub Saharan Regional Workshop
### November 12-16, 2012
### Colombo, Sri Lanka

<table>
<thead>
<tr>
<th>Day/Date/Time</th>
<th>Session</th>
<th>Facilitator</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Day 1</strong></td>
<td><strong>Monday</strong></td>
<td><strong>12 November</strong></td>
</tr>
<tr>
<td>0800-0830</td>
<td>Registration</td>
<td></td>
</tr>
<tr>
<td>0830-0930</td>
<td>Welcome; Goals; Introductions</td>
<td>Dileepkumar, Guntuku, Cynthia Rosenzweig</td>
</tr>
<tr>
<td></td>
<td>o Brief Welcomes from AgMIP PIs and Leaders, Workshop Organizers, Host Country Project Leader</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Overview of Workshop Goals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Brief Introductions of Stakeholders</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Brief Introductions of Participants</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Welcome to representatives from Media</td>
<td></td>
</tr>
<tr>
<td>0930-1030</td>
<td>Overview of Regional Project Plans (20 min, 10 min discussion)</td>
<td>L Zubair, P Paramasivam</td>
</tr>
<tr>
<td></td>
<td>o Sri Lanka Regional Project Plan</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Southern India Regional Project Plan</td>
<td></td>
</tr>
<tr>
<td>1030-1100</td>
<td>Tea/Coffee Break</td>
<td></td>
</tr>
<tr>
<td>1100-1230</td>
<td>Continue Overview of Regional Project Plans</td>
<td>B Gangwar, A Ashfaq, D Guntuku</td>
</tr>
<tr>
<td></td>
<td>o Indo-Gangetic Basin Regional Project Plan</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Pakistan Regional Project Plan</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o AgMIP Regional Coordination Plan</td>
<td></td>
</tr>
<tr>
<td>1230-1300</td>
<td>Facilitated Discussion: Stakeholder inputs</td>
<td>J Jones</td>
</tr>
<tr>
<td>1300-1430</td>
<td>Workshop Photo, Lunch</td>
<td></td>
</tr>
<tr>
<td>1430-1515</td>
<td>Presentation: Integrated Assessments</td>
<td></td>
</tr>
</tbody>
</table>
1515-1530 Anticipated Challenges and Charge to Research Team Breakouts

1530-1600 Tea/Coffee break

1600-1715 Regional Research Team Breakouts

- Responding to Stakeholder inputs
- Anticipating Challenges
- Areas of Concentration and/or Additional Training
- Synergies with other programs

1715-1745 Regional Team Report Back and Discussion

1745-1800 Wrap-up Day 1; Anticipate Day 2

Day 2

Tuesday

13 November

Focus on specific project activities with guidance from AgMIP Team Leaders. Early plenary and then full-team round-robin breakouts with interactive discussions focusing on each disciplinary activity and overall project integration

0830-0930 Plenary Session

- Goals for Day 2
- Scaling up Crop Model simulations to districts for use in Integrated Assessments: Case Study of Anantapur District in India
- Methods for developing RAPs for regions
- Intent of Breakout ‘Round Robin’ Sessions

0930-1100 Parallel Breakout ‘Round Robin’ Sessions

- Crop data, modeling, and IT – Pakistan
- Climate data, modeling and scenarios – Sri Lanka
- Economic data, modeling and RAPS – Southern India
- Collaboration, management and outputs – Indo-Gangetic Basin

1100-1130 Tea/Coffee Break

1130-1300 Parallel Breakout Sessions (Continued)
Crop data, modeling, and IT – Sri Lanka
Climate data, modeling and scenarios – Southern India
Economic data, modeling and RAPS – Indo-Gangetic Basin
Collaboration, management and outputs – Pakistan

K. Boote, J. Hargreaves, C. Porter, P. Singh, Nedu, A. Ruane, D. Murthy

J. Antle, R. Valdivia, C. Bantilan, P. Craufurd C. Rosenzweig, J. Jones, D. Guntuku, C. Mutter

1300-1400 Lunch
1400-1530 Parallel Breakout Sessions (Continued)
Crop data, modeling, and IT – Southern India
Climate data, modeling and scenarios – Indo-Gangetic Basin
Economic data, modeling and RAPS – Pakistan
Collaboration, management and outputs – Sri Lanka

K. Boote, J. Hargreaves, C. Porter, P. Singh, Nedu, A. Ruane, D. Murthy

J. Antle, R. Valdivia, C. Bantilan C. Rosenzweig, J. Jones, D. Guntuku, C. Mutter

1530-1600 Tea/Coffee break
1600-1730 Parallel Breakout Sessions (Continued)
Crop data, modeling, and IT – Indo-Gangetic Basin
Climate data, modeling and scenarios – Pakistan
Economic data, modeling and RAPS – Sri Lanka
Collaboration, management and outputs – Southern India

K. Boote, J. Hargreaves, C. Porter, P. Singh, Nedu, A. Ruane, D. Murthy

J. Antle, R. Valdivia, C. Bantilan C. Rosenzweig, J. Jones, D. Guntuku, C. Mutter

1730-1800 Plenary
Discussion, Wrap-up Day 2, Anticipate Day 3
Day 3  
Wednesday  
14 November

### Integrated assessments Morning Plenary and then interactive breakout discussions with a focus on integrated assessment methodologies for the fast-track integrated assessment and beyond

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>0830-1030</td>
<td>Plenary Session &lt;br&gt;  o Goals for Day 3 &lt;br&gt;  o Highlights of Day 2 breakout sessions (10 min each) &lt;br&gt;  ➢ Sri Lanka &lt;br&gt;  ➢ Southern India &lt;br&gt;  ➢ Indo-Gangetic Basin &lt;br&gt;  ➢ Pakistan &lt;br&gt;  ➢ Regional Collaboration &lt;br&gt;  o Discussion</td>
<td>Rosenzweig, Jones&lt;br&gt;Sri Lanka Team&lt;br&gt;Southern India Team&lt;br&gt;Indo-Gangetic Basin Team&lt;br&gt;Pakistan Team&lt;br&gt;Regional Collaboration Team</td>
</tr>
<tr>
<td>1030-1100</td>
<td>Tea/Coffee Break</td>
<td></td>
</tr>
<tr>
<td>1100-1300</td>
<td>Breakout Sessions (climate, crop modeling, economic modeling, and IT) &lt;br&gt;  o Simulating regional crop productivity – methods and tools for modeling and assessment (combined crops, climate, IT teams) &lt;br&gt;  ➢ Crop modeling &lt;br&gt;  ➢ Climate &lt;br&gt;  ➢ IT &lt;br&gt;  o Economic &lt;br&gt;  o Coordination planning</td>
<td>K. Boote, J. Hargreaves (A. Ruane; for first hour, then meeting individually) C. Porter J. Antle, R. Valdivia Jim, C. Rosenzweig, D Guntuku C. Mutter, P. Craufurd, C. Bantilan</td>
</tr>
<tr>
<td>1300-1400</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>1400-1530</td>
<td>Continue each breakout group</td>
<td></td>
</tr>
<tr>
<td>1530-1600</td>
<td>Tea/Coffee break</td>
<td></td>
</tr>
<tr>
<td>1600-1630</td>
<td>Plenary &lt;br&gt;  o Preliminary feedback Wrap-up Day 3, Anticipate Day 4</td>
<td></td>
</tr>
<tr>
<td>1630-1700</td>
<td>Web tools and resources</td>
<td>C Porter and D Guntuku</td>
</tr>
</tbody>
</table>

Day 4
Thursday  
15 November

### Continued focus on integrated assessments and other team activities Morning Plenary and then breakout discussions on integrated assessment methodologies and disciplinary

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th></th>
</tr>
</thead>
</table>
### Day 4

**0830-0900**  
Plenary  
- Goals for Day 4  
- Charge to Breakout Groups  
  Rosenzweig, Jones

**0900-1045**  
Parallel Breakout Sessions (Integrated Assessment Emphasis)  
- Crop productivity (Crop modeling and IT teams)  
- Economic  
- Climate

**1045-1115**  
Tea/Coffee Break

**1115-1300**  
Parallel Breakout Sessions Continue

**1300-1400**  
Lunch

**1400-1530**  
Breakout Sessions by disciplinary team  
- Crop modeling  
- Climate  
- Economic  
- IT  
  K. Boote, J. Hargreaves, A. Ruane, J. Antle, R. Valdivia, C. Porter

**1530-1600**  
Tea/Coffee break

**1600-1730**  
Breakouts by AgMIP Regional Project Teams  
- Assessment of progress  
- Adjustment of research plans to address requirements of integrated assessments, etc.  
- Summary of outstanding team needs for RCT synthesis among all teams  
- Targeted publications and other outputs  
- Preparation of research presentation for Day 5 morning Plenary

**1730-1800**  
Plenary Session  
- Discussion, Wrap-up Day 4, Anticipate Day 5

### Day 5  
**Friday 16 November**

**0745**  
Depart Cinnamon Hotel to IWMI

**0830-0900**  
Arrival and Welcome to IWMI
0900-0915  Plenary
  o  Goals for Day 5  
  Rosenzweig, Jones

0915-1030  Breakouts by AgMIP Regional Project Teams
  o  Completion of research presentation for Day 5

1030-1100  Plenary - Regional Coordination Feedback
  o  Synthesis of team needs
  o  Provisional outline and timeline for SSA special publication or book
  o  Discussion
  Guntuku

1100-1200  IWMI Walkabout

1200-1300  Working Lunch

1300-1430  Regional Research Team Synthesis and Report-back
  o  Pakistan  
  Pakistan Team
  o  Indo-Gangetic Basin  
  Basin Team
  o  Southern India  
  Southern India Team
  o  Sri Lanka  
  Sri Lanka Team
  o  Regional Collaboration  
  Coordination Team

1430-1530  Concluding Session
  o  General discussion – what worked, what didn’t; recommendations
  o  Next steps
  o  Wrap-up

1530  Adjourn

Transportation to Cinnamon Lakeside Hotel
### Appendix III. Participants for the First AgMIP South Asia Workshop on Integrated Regional Coordination in Colombo, Sri Lanka, 12-16th November 2012.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name</th>
<th>Address</th>
<th>Contact information</th>
<th>Team / Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dr John Antle</td>
<td>AgMIP Economics PI, Rm #220A Ballard Extension Hall, Oregon State University Corvallis, OR 97331, USA</td>
<td>E: <a href="mailto:John.Antle@oregonstate.edu">John.Antle@oregonstate.edu</a></td>
<td>AgMIP Team</td>
</tr>
<tr>
<td>2</td>
<td>Dr Guillermo A Baigorria</td>
<td>AgMIP Resource Person, 261 Frazier Rogers Hall Agricultural and Biological Engineering Dept Gainesville, FL 32611, USA</td>
<td>E:<a href="mailto:gbaigorrr@ifas.ufl.edu">gbaigorrr@ifas.ufl.edu</a> (Old); <a href="mailto:gbaigorria@unl.edu">gbaigorria@unl.edu</a></td>
<td>AgMIP Team</td>
</tr>
<tr>
<td>3</td>
<td>Dr Ken Boote</td>
<td>AgMIP Crop Modeling PI, 304 Newell Hall, PO Box 110500, Gainesville, FL 32611, USA</td>
<td>E:<a href="mailto:kiboote@ufl.edu">kiboote@ufl.edu</a></td>
<td>AgMIP Team</td>
</tr>
<tr>
<td>4</td>
<td>Dr John Hargreaves</td>
<td>Crop Modeling, CSIRO, Ecosystem Sciences, 203 Tor Street, Toowoomba, Qld, Australia 4350</td>
<td>E:<a href="mailto:John.Hargreaves@csiro.au">John.Hargreaves@csiro.au</a></td>
<td>AgMIP Team</td>
</tr>
<tr>
<td>5</td>
<td>Dr Gerrit Hoogenboom</td>
<td>AgMIP Resource Person; Director, AgWeatherNet, and Professor of Agrometeorology, Washington State University 24106 North Bunn Road Prosser, Washington 99350-8694, USA</td>
<td>T: 1-509-786-9371 E:<a href="mailto:gerrit.hoogenboom@wsu.edu">gerrit.hoogenboom@wsu.edu</a></td>
<td>AgMIP Team</td>
</tr>
<tr>
<td>6</td>
<td>Dr Jim Jones</td>
<td>AgMIP PI, Florida Climate Institute, 289 Frazier Rogers Hall, PO Box 110570, Gainesville, FL 32611, USA</td>
<td>E:<a href="mailto:jimj@ufl.edu">jimj@ufl.edu</a></td>
<td>AgMIP Team</td>
</tr>
<tr>
<td>7</td>
<td>Dr Sonali McDermid</td>
<td>AgMIP Resource Person, NASA Goddard Institute for Space Studies, 2880 Broadway, New York, NY 10025, USA</td>
<td>E:<a href="mailto:sps2113@columbia.edu">sps2113@columbia.edu</a></td>
<td>AgMIP Team</td>
</tr>
<tr>
<td>8</td>
<td>Dr Carolyn Z Mutter</td>
<td>AgMIP International Project Coordinator, Columbia University Center for Climate Systems Research, Armstrong Hall - 2880 Broadway, New York, NY 10025, USA</td>
<td>E:<a href="mailto:czm2001@columbia.edu">czm2001@columbia.edu</a></td>
<td>AgMIP Team</td>
</tr>
<tr>
<td>9</td>
<td>Dr Cheryl Porter</td>
<td>AgMIP IT PI, Dept of Agricultural and Biological Engineering, 243 Rogers, PO Box 110570, Gainesville FL 32611, USA</td>
<td>E:<a href="mailto:CPorter@ufl.edu">CPorter@ufl.edu</a></td>
<td>AgMIP Team</td>
</tr>
<tr>
<td>10</td>
<td>Dr Cynthia Rosenzweig</td>
<td>AgMIP PI, NASA Goddard Institute for Space Studies 2880 Broadway, New York, NY 10025, USA</td>
<td>E:<a href="mailto:crosenzweig@giss.nasa.gov">crosenzweig@giss.nasa.gov</a></td>
<td>AgMIP Team</td>
</tr>
<tr>
<td>11</td>
<td>Dr Alex Ruane</td>
<td>AgMIP Climate PI, Research Physical Scientist, Climate Impacts Group, NASA GISS, 2880 Broadway, New York NY 10025, USA</td>
<td>T: +001 212 678 5640 E:<a href="mailto:aruane@giss.nasa.gov">aruane@giss.nasa.gov</a></td>
<td>AgMIP Team</td>
</tr>
<tr>
<td>12</td>
<td>Dr Roberto</td>
<td>Economics, Ballard Extension Hall,</td>
<td>E:</td>
<td>AgMIP Team</td>
</tr>
<tr>
<td>No.</td>
<td>Name</td>
<td>Affiliation</td>
<td>Contact Information</td>
<td>Location</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>13</td>
<td>Dr Daniel Wallach</td>
<td>AgMIP Resource Person, INRA, UMR1248, BP 52627 F-31326 Castanet-Tolosan Cedex, France</td>
<td>E: <a href="mailto:wallach@toulouse.inra.fr">wallach@toulouse.inra.fr</a></td>
<td>AgMIP Team</td>
</tr>
<tr>
<td>14</td>
<td>Dr P Paramasivam</td>
<td>Professor, Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore -641 003. Tamil Nadu, India</td>
<td>T: 91-94423 44051 E: <a href="mailto:params@tnau.ac.in">params@tnau.ac.in</a></td>
<td>South India</td>
</tr>
<tr>
<td>15</td>
<td>Dr R Balasubramanian</td>
<td>Professor, Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore -641 003, Tamil Nadu, India</td>
<td>T: +91 99655 72120 E: <a href="mailto:rubalu@gmail.com">rubalu@gmail.com</a></td>
<td>South India</td>
</tr>
<tr>
<td>16</td>
<td>Dr D Suresh Kumar</td>
<td>Associate Professor, Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore -641 003. Tamil Nadu, India</td>
<td>T: +91 94422 06169 E: <a href="mailto:rithusuresh@yahoo.com">rithusuresh@yahoo.com</a></td>
<td>South India</td>
</tr>
<tr>
<td>17</td>
<td>Dr V Geethalakshmi</td>
<td>Professor and Head, Agro Climate Research Centre, Tamil Nadu Agricultural University, Coimbatore -641 003. Tamil Nadu, India</td>
<td>T: 91-9994433479 E: <a href="mailto:geetha@tnau.ac.in">geetha@tnau.ac.in</a></td>
<td>South India</td>
</tr>
<tr>
<td>18</td>
<td>Dr A Lakshmanan</td>
<td>Associate Professor, Department of Nano Science and Technology, Tamil Nadu Agricultural University, Coimbatore -641 003. Tamil Nadu, India</td>
<td>T: +91-9994 666113 E: <a href="mailto:lakshmanantnau@yahoo.com">lakshmanantnau@yahoo.com</a>; <a href="mailto:microlaxman@yahoo.com">microlaxman@yahoo.com</a></td>
<td>South India</td>
</tr>
<tr>
<td>19</td>
<td>Dr R Krishnan</td>
<td>Associate Professor, Department of Remote Sensing &amp; GIS, Tamil Nadu Agricultural University, Coimbatore -641 003. Tamil Nadu, India</td>
<td>T: E: <a href="mailto:agrikrish@gmail.com">agrikrish@gmail.com</a></td>
<td>South India</td>
</tr>
<tr>
<td>20</td>
<td>Dr Raji Reddy Danda</td>
<td>Director, ACRC, ANGRAU, Rajendranagar, Hyderabad, India</td>
<td>T: +91 9989625220 E: <a href="mailto:dandareddy009@gmail.com">dandareddy009@gmail.com</a></td>
<td>South India</td>
</tr>
<tr>
<td>21</td>
<td>Dr Medha Dakshina Murthy Kadiyala</td>
<td>Scientist (Agronomy), ACRC, Rajendranagar, ANGRAU, Hyderabad, India</td>
<td>T: +91 9618956219 E: <a href="mailto:dakshu2k@gmail.com">dakshu2k@gmail.com</a></td>
<td>South India</td>
</tr>
<tr>
<td>22</td>
<td>Dr Syed Aftab Wajid</td>
<td>Co-PI University of Agriculture, Faisalabad, Crop modelling, Pakistan</td>
<td>T: E: <a href="mailto:aftabwajid@hotmail.com">aftabwajid@hotmail.com</a></td>
<td>Pakistan</td>
</tr>
<tr>
<td>23</td>
<td>Dr Tasneem Khaliq</td>
<td>Co-PI University of Agriculture, Faisalabad, Crop modelling, Pakistan</td>
<td>T: E: <a href="mailto:drtasneem@uaf.edu.pk">drtasneem@uaf.edu.pk</a></td>
<td>Pakistan</td>
</tr>
<tr>
<td>24</td>
<td>Dr Muhammad Ashfaq</td>
<td>Professor and Director, Institute of Agricultural and Resource Economics, University of Agriculture, Faisalabad 38040, Pakistan</td>
<td>T: +92-300-6626237 E: <a href="mailto:ashfaq9@hotmail.com">ashfaq9@hotmail.com</a></td>
<td>Pakistan</td>
</tr>
<tr>
<td>25</td>
<td>Dr Shakeel Ahmad</td>
<td>Co-PI, Crop modelling, Associate Professor (Agronomy), Bahauddin Zakariya University, Multan-60800, Pakistan</td>
<td>T: E: <a href="mailto:shakeelahmad@bzu.edu.pk">shakeelahmad@bzu.edu.pk</a></td>
<td>Pakistan</td>
</tr>
<tr>
<td>No.</td>
<td>Name</td>
<td>Position and Contact Information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 26  | Dr Ahsan Raza Sattar  | Co-PI University of Agriculture, Faisalabad, Pakistan  
T: E: ahsan_raza@uaf.edu.pk                                        |
| 27  | Dr Wajid Nasim        | Co-PI, Asst. Professor, Dept. of Environmental Science, COMSATS-Institute of Information Technology (CIIT), Off Multan Road, Vehari 61100, Pakistan  
T: E: wajidnasim@ciitvehari.edu.pk                                         |
| 28  | Dr B Gangwar          | Project Director, Project Directorate for Farming Systems Research, Modipuram-250110, Meerut, Uttar Pradesh, India  
T:+91-9412202070  
E: directorpdfsr@yahoo.com |
| 29  | Dr N Subash           | Senior Scientist, Project Directorate for Farming Systems Research, Modipuram-250110, Meerut, Uttar Pradesh, India  
T:+91-9457248070  
E: n_suby@rediffmail.com |
| 30  | Dr Harbir Singh       | Principal Scientist, Project Directorate for Farming Systems Research, Modipuram-250110, Meerut, Uttar Pradesh, India  
T:+91-9458403937  
E: hs.pdfsr@yahoo.com |
| 31  | Dr Anup Das           | Senior Scientist, ICAR Research Complex for NEH region, Umiam, Meghalaya-793103, India  
T:+91-9436336070  
E: anup_icar@yahoo.com  |
| 32  | Dr B U Choudhury      | Senior Scientist, Division of Soil Science, Indian Council of Agricultural Research Complex for NEH Region, Umiam, Meghalaya-793 103, India  
T: +91-364-2570589  
E: burhan3i@yahoo.com |
| 33  | Dr. Yashpal Sahrawat  | Senior Scientist, Division of Soil Science and Agricultural Chemistry, IARI, Pusa, New Delhi 110012, India  
T: E: yssaharawat@gmail.com |
| 34  | Dr Rajendra Darai     | Senior Scientist, National Grain Legumes Research Program, Nepal Agricultural Research Council, Rampur, Chitwan, Nepal  
Cell +9779845051523  
E: rajendra5042@yahoo.co.uk |
| 35  | Dr Andrew McDonald    | Cropping System Agronomist, CIMMYT-South Asia Regional Office, Kathmandu, Nepal  
T: E: a.mcdonald@cgiar.org |
| 36  | Dr Dinesh Thapa Magar | Socio-Economist, Nepal Agricultural Research Council (NARC), Kathmandu, Nepal  
T: E: darlami.dinesh@gmail.com  |
| 37  | Dr Sk. Ghulam Hussain | Independent Researcher  
Former Member-Director (Planning & Evaluation)  
Bangladesh Agricultural Research Council, Bangladesh  
T: 608-5885-0171  
E: ghussain@agni.com; hussain@hussainsg.net |
| 38  | Dr M Abeed Hossain Chowdhury | Director (Computer & GIS Unit)  
Bangladesh Agricultural Research Council, Farm Gate, New Airport Road, Dhaka 1215, Bangladesh  
T:  
E: abeed_chowdhury@yahoo.com |
| 39  | Dr. Sohela Akhter     | Senior Scientific Officer, Division of Soil Science, Bangladesh Agricultural Research Institute (BARI), Joydebpur, Gazipur 1701, Bangladesh  
T: E: sohela_akhter@yahoo.com |

Pakistan

Dr Ahsan Raza Sattar  
Co-PI University of Agriculture, Faisalabad, Pakistan  
T:  
E: ahsan_raza@uaf.edu.pk

Dr Wajid Nasim  
Co-PI, Asst. Professor, Dept. of Environmental Science, COMSATS-Institute of Information Technology (CIIT), Off Multan Road, Vehari 61100, Pakistan  
T:  
E: wajidnasim@ciitvehari.edu.pk

Dr B Gangwar  
Project Director, Project Directorate for Farming Systems Research, Modipuram-250110, Meerut, Uttar Pradesh, India  
T:+91-9412202070  
E: directorpdfsr@yahoo.com

Dr N Subash  
Senior Scientist, Project Directorate for Farming Systems Research, Modipuram-250110, Meerut, Uttar Pradesh, India  
T:+91-9457248070  
E: n_suby@rediffmail.com

Dr Harbir Singh  
Principal Scientist, Project Directorate for Farming Systems Research, Modipuram-250110, Meerut, Uttar Pradesh, India  
T:+91-9458403937  
E: hs.pdfsr@yahoo.com

Dr Anup Das  
Senior Scientist, ICAR Research Complex for NEH region, Umiam, Meghalaya-793103, India  
T:+91-9436336070  
E: anup_icar@yahoo.com

Dr B U Choudhury  
Senior Scientist, Division of Soil Science, Indian Council of Agricultural Research Complex for NEH Region, Umiam, Meghalaya-793 103, India  
T: +91-364-2570589  
E: burhan3i@yahoo.com

Dr. Yashpal Sahrawat  
Senior Scientist, Division of Soil Science and Agricultural Chemistry, IARI, Pusa, New Delhi 110012, India  
T:  
E: yssaharawat@gmail.com

Dr Rajendra Darai  
Senior Scientist, National Grain Legumes Research Program, Nepal Agricultural Research Council, Rampur, Chitwan, Nepal  
Cell +9779845051523  
E: rajendra5042@yahoo.co.uk

Dr Andrew McDonald  
Cropping System Agronomist, CIMMYT-South Asia Regional Office, Kathmandu, Nepal  
T:  
E: a.mcdonald@cgiar.org

Dr Dinesh Thapa Magar  
Socio-Economist, Nepal Agricultural Research Council (NARC), Kathmandu, Nepal  
T:  
E: darlami.dinesh@gmail.com

Dr Sk. Ghulam Hussain  
Independent Researcher  
Former Member-Director (Planning & Evaluation)  
Bangladesh Agricultural Research Council, Bangladesh  
T: 608-5885-0171  
E: ghussain@agni.com; hussain@hussainsg.net

Dr M Abeed Hossain Chowdhury  
Director (Computer & GIS Unit)  
Bangladesh Agricultural Research Council, Farm Gate, New Airport Road, Dhaka 1215, Bangladesh  
T:  
E: abeed_chowdhury@yahoo.com

Dr. Sohela Akhter  
Senior Scientific Officer, Division of Soil Science, Bangladesh Agricultural Research Institute (BARI), Joydebpur, Gazipur 1701, Bangladesh  
T:  
E: sohela_akhter@yahoo.com
<table>
<thead>
<tr>
<th></th>
<th>Name</th>
<th>Position/Role</th>
<th>Contact Information</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>Dr Balwinder Singh</td>
<td>Post-Doctoral Fellow, IRRI, DAPO 7777 Metro Manila, Philippines</td>
<td>T: +63 2 580 5600 ext. 2445 E: <a href="mailto:b.singh@irri.org">b.singh@irri.org</a></td>
<td>Indo-Gangetic Plains</td>
</tr>
<tr>
<td>41</td>
<td>Dr Peter Q. Craufurd</td>
<td>Research Program Director, Resilient Dryland Systems, ICRISAT, Patancheru PO 502324, Andhra Pradesh, India</td>
<td>T: +91 9849053480 E: <a href="mailto:p.craufurd@cgiar.org">p.craufurd@cgiar.org</a></td>
<td>ICRISAT</td>
</tr>
<tr>
<td>42</td>
<td>Dr G. Dileepkumar</td>
<td>Global Leader, Knowledge Sharing and Innovation, ICRISAT, Patancheru PO 502324, Andhra Pradesh, India</td>
<td>T: 91 40 30713205 E: <a href="mailto:g.dileepkumar@cgiar.org">g.dileepkumar@cgiar.org</a></td>
<td>ICRISAT</td>
</tr>
<tr>
<td>43</td>
<td>Dr MCS Bantilan</td>
<td>Research Program Director, Markets, Institutions and Policies, ICRISAT, Patancheru PO 502324, Andhra Pradesh, India</td>
<td>T: 91 40 30713517 E: <a href="mailto:c.bantilan@cgiar.org">c.bantilan@cgiar.org</a></td>
<td>ICRISAT</td>
</tr>
<tr>
<td>44</td>
<td>Mr S V Prasad Rao</td>
<td>Senior Administrative Officer, Knowledge Sharing and Innovation, ICRISAT, Patancheru PO 502324, Andhra Pradesh, India</td>
<td>T: 91 40 30713361 E: <a href="mailto:s.prasadrao@cgiar.org">s.prasadrao@cgiar.org</a></td>
<td>ICRISAT</td>
</tr>
<tr>
<td>45</td>
<td>Ms V. Manvitha</td>
<td>Research Fellow, Knowledge Sharing and Innovation, ICRISAT, Patancheru PO 502324, Andhra Pradesh, India</td>
<td>T: +91 9533382494 E: <a href="mailto:v.manvitha8@gmail.com">v.manvitha8@gmail.com</a></td>
<td>ICRISAT</td>
</tr>
<tr>
<td>46</td>
<td>Mr Jeetendra Singh</td>
<td>System Analyst, Knowledge Sharing and Innovation, ICRISAT, Patancheru PO 502324, Andhra Pradesh, India</td>
<td>T: 09450838830 E: <a href="mailto:jeetendrasingh@gmail.com">jeetendrasingh@gmail.com</a></td>
<td>ICRISAT</td>
</tr>
<tr>
<td>47</td>
<td>Dr Nedumaran Swamikannu</td>
<td>Scientist Economics, Markets, Institutions and Policies, ICRISAT, Patancheru PO 502324, Andhra Pradesh, India</td>
<td>T: 91 40 30713522 E: <a href="mailto:s.nedumaran@cgiar.org">s.nedumaran@cgiar.org</a></td>
<td>ICRISAT</td>
</tr>
<tr>
<td>48</td>
<td>Dr Piara Singh</td>
<td>Consultant, Markets, Institutions and Policies, ICRISAT, Patancheru PO 502324, Andhra Pradesh, India</td>
<td>T: 91 40 30713334 E: <a href="mailto:p.singh@cgiar.org">p.singh@cgiar.org</a></td>
<td>ICRISAT</td>
</tr>
<tr>
<td>49</td>
<td>Dr S P Nissanka</td>
<td>PI, Department of Crop Science, University of Peradeniya, Sri Lanka</td>
<td>E: <a href="mailto:nissankasp@yahoo.com">nissankasp@yahoo.com</a></td>
<td>Sri Lanka</td>
</tr>
<tr>
<td>50</td>
<td>Dr Lareef Zubair</td>
<td>Co-PI, Foundation for Environment, Climate and Technology (FECT), Digana Village, Rajawella, Sri Lanka</td>
<td>E: <a href="mailto:lareefzubair@gmail.com">lareefzubair@gmail.com</a></td>
<td>Sri Lanka</td>
</tr>
<tr>
<td>51</td>
<td>Dr W L Keerthipala</td>
<td>Co-PI, Economics, Sugarcane Research Institute, Udawalawe, Sri Lanka</td>
<td>E: <a href="mailto:apkeerthipala@yahoo.com">apkeerthipala@yahoo.com</a></td>
<td>Sri Lanka</td>
</tr>
<tr>
<td>52</td>
<td>Dr W M W Weerakoon</td>
<td>Co-PI, FCRDI, , Department of Agriculture, Maha Illupallama, Sri Lanka</td>
<td>E: <a href="mailto:weerakoonwmw@gmail.com">weerakoonwmw@gmail.com</a></td>
<td>Sri Lanka</td>
</tr>
<tr>
<td>53</td>
<td>Ms B D Sandya Ariyawansha</td>
<td>Co-PI, Sugarcane Research Institute, Sri Lanka</td>
<td>E: <a href="mailto:asandyakumari@yahoo.com">asandyakumari@yahoo.com</a></td>
<td>Sri Lanka</td>
</tr>
<tr>
<td>54</td>
<td>Mr Vidhara Ralapanawe</td>
<td>Co-PI, MAS Holdings, IT, Foundation for Environment, Climate and Technology (FECT), Digana Village, Rajawella, Sri Lanka</td>
<td>E: <a href="mailto:vidhurar@masholdings.com">vidhurar@masholdings.com</a></td>
<td>Sri Lanka</td>
</tr>
<tr>
<td></td>
<td>Name</td>
<td>Position</td>
<td>Institution/Location</td>
<td>Email 1</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------</td>
<td>-----------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>55</td>
<td>Mr Prabodha Agalawatte</td>
<td>IT, Foundation for Environment, Climate and Technology (FECT), Digana Village, Rajawella, <strong>Sri Lanka</strong></td>
<td></td>
<td><a href="mailto:pr.agalawatte@gmail.com">pr.agalawatte@gmail.com</a></td>
</tr>
<tr>
<td>56</td>
<td>Prof. Piyasena Wickramagamage</td>
<td>Co-PI, Climate and IT/GIS, Department of Geography, University of Peradeniya, <strong>Sri Lanka</strong></td>
<td></td>
<td><a href="mailto:wickramagge@yahoo.com">wickramagge@yahoo.com</a></td>
</tr>
<tr>
<td>57</td>
<td>Mr Kanagaratnam Shanmuganathan</td>
<td>Investigator, Crop Modelling, Sugarcane Research Institute, <strong>Sri Lanka</strong></td>
<td></td>
<td><a href="mailto:ashanmu@gmail.com">ashanmu@gmail.com</a></td>
</tr>
<tr>
<td>58</td>
<td>Dr Rasnayaka Herath</td>
<td>Investigator, Economics, SEPC, Department of Agriculture, Peradeniya, <strong>Sri Lanka</strong></td>
<td></td>
<td><a href="mailto:herath.rasnayaka1@gmail.com">herath.rasnayaka1@gmail.com</a>; <a href="mailto:herathrm@yahoo.com">herathrm@yahoo.com</a></td>
</tr>
<tr>
<td>59</td>
<td>Mr. Dumindu Herath</td>
<td>Econ/Climate, Foundation for Environment, Climate and Technology, Digana Village, Rajawella, <strong>Sri Lanka</strong></td>
<td></td>
<td><a href="mailto:duminduherath@gmail.com">duminduherath@gmail.com</a></td>
</tr>
<tr>
<td>60</td>
<td>Ms. Zeenas Yahiya</td>
<td>Econ/Climate Coordination, Foundation for Environment, Climate and Technology, Digana Village, Rajawella, <strong>Sri Lanka</strong></td>
<td></td>
<td><a href="mailto:zeemail827@gmail.com">zeemail827@gmail.com</a></td>
</tr>
<tr>
<td>61</td>
<td>Mr Sampath Deegalla</td>
<td>Lecturer, Department of Computer Engineering, Faculty of Engineering, University of Peradeniya, <strong>Sri Lanka</strong></td>
<td></td>
<td><a href="mailto:dsdeegalla@pdn.ac.lk">dsdeegalla@pdn.ac.lk</a></td>
</tr>
<tr>
<td>62</td>
<td>Dr Chamilla Walgampaya</td>
<td>Lecturer, Department of Engineering Mathematics, Faculty of Engineering, University of Peradeniya, <strong>Sri Lanka</strong></td>
<td></td>
<td><a href="mailto:ckw@pdn.ac.lk">ckw@pdn.ac.lk</a>; <a href="mailto:chamilla9657@gmail.com">chamilla9657@gmail.com</a></td>
</tr>
<tr>
<td>63</td>
<td>Mr Janaka Gunaratna</td>
<td>Crop Science/Climate, Faculty of Agriculture, Rajarata University, Mihintale, <strong>Sri Lanka</strong></td>
<td></td>
<td><a href="mailto:janaka78@gmail.com">janaka78@gmail.com</a></td>
</tr>
<tr>
<td>64</td>
<td>Ms Erandika Wijekoon</td>
<td>Economics, Foundation for Environment, Climate and Technology, Digana Village, Rajawella, <strong>Sri Lanka</strong></td>
<td></td>
<td><a href="mailto:erandikawijekoon@gmail.com">erandikawijekoon@gmail.com</a></td>
</tr>
<tr>
<td>65</td>
<td>Mr Chamila Perera</td>
<td>Research Officer, Field Crops Research and Development Centre, Department of Agriculture, Maha Illupallama, Anurhadhapura, <strong>Sri Lanka</strong></td>
<td></td>
<td><a href="mailto:chamilaperere@yahoo.com">chamilaperere@yahoo.com</a></td>
</tr>
<tr>
<td>66</td>
<td>Ms. Punya Delpitiya</td>
<td>Research Officer, Department of Agriculture, Aralanganwila, <strong>Sri Lanka</strong></td>
<td></td>
<td><a href="mailto:punya14@yahoo.com">punya14@yahoo.com</a></td>
</tr>
<tr>
<td>67</td>
<td>Mr Yasas Harischandra</td>
<td>Research Officer, Foundation for Environment, Climate and Technology (FECT), Digana Village, <strong>Sri Lanka</strong></td>
<td></td>
<td><a href="mailto:yasasclmd@gmail.com">yasasclmd@gmail.com</a>; <a href="mailto:yasasgeethall@gmail.com">yasasgeethall@gmail.com</a></td>
</tr>
<tr>
<td>68</td>
<td>Prof Champa Navaaratne</td>
<td>Department of Agricultural Engineering, University of Ruhuna, <strong>Sri Lanka</strong></td>
<td></td>
<td><a href="mailto:champa@agricc.ruh.ac.lk">champa@agricc.ruh.ac.lk</a>; <a href="mailto:champa_m2004@yahoo.com">champa_m2004@yahoo.com</a></td>
</tr>
</tbody>
</table>
Prof K D N Weerasinghe  
Department of Agricultural Engineering, University of Ruhuna, Sri Lanka  
E: kdnweerasinghe@yahoo.com; kdnw@ageng.ruh.ac.lk  
Sri Lanka

Mr Chandrajith de Silva  
Research Officer, Sugarcane Research Institute, UdaWalawe, Sri Lanka  
E: alc.desilva@yahoo.com  
Sri Lanka

Mr S K Cyril  
Chairman/ Sugarcane Research Institute, Phelawala Road Ratmalana, Sri Lanka  
E: cyrilsk@hotmail.com  
Sri Lanka Stake Holders

Mr Ajith Silva  
Director, Planning and Biodiversity Division, Ministry of Environment, Sri Lanka  
E: koralage2001@yahoo.com  
Sri Lanka Stake Holders

K.N.Kannangara  
Research officer, FCRDI, Mahailuppallama, Sri Lanka  
E: kannangara@gmail.com  
Sri Lanka Stake Holders

Dr. D.P.T. Wijeratne  
Additional Secretary, Ministry of Agriculture, Baththaramulla, Sri Lanka.  
E: dbtwij@hotmail.com  
Sri Lanka Stake Holders

Ms. Anoja Herath  
Deputy Director, Climate change Division, Ministry of Environment, Sampathpaya, Baththaramulla, Sri Lanka.  
E: anoja.herath@yahoo.com  
Sri Lanka Stake Holders

Dr Herath Manthrithilake  
Head, Sri Lanka Development Initiative, International Water Management Institute PO Box 2075, Colombo  
E: h.manthri@cgiar.org  
IWMI

Dr Peter G. McCormick  
Deputy Director General (Research), International Water Management Institute PO Box 2075, Colombo  
E: p.mccornick@cgiar.org  
IWMI

**Acknowledgements:**
AgMIP RCT-South Asia Team is very thankful to Job Kihara of RCT-SSA, for providing template which was helpful in preparing this workshop report. Also thankful to AgMIP leadership team for providing valuable input.