# Adaptation and Mitigation Program for Aral Sea Basin (CAMP4ASB)

*Terms of Reference for Consultant (firm) for*

**Capacity building and research on crop yield prediction using crop modeling system**

**Background**

The Climate Adaptation and Mitigation Program for Aral Sea Basin (CAMP4ASB) aims to enhance regional access to improved climate change knowledge services for key stakeholders (e.g., policy makers, communities, and civil society) in participating Central Asian countries as well as to increase investments and capacity building that, combined, will address climate challenges common to these countries.

This assignment is to be carried under the Component 1 of the CAMP4ASB project, “Regional Climate Knowledge Services”, and refers to the following sub-activities of the project: 1.3. “Methodologies, approaches, and tools”; 1.4. “Developing knowledge products”; 1.5. “Capacity building”.

The hydrometeorological services of the Central Asia countries have identified the need for developing a Cropping System Model to simulating the growth and development of crops and anticipating the yields in a climate change context. The model should also take into consideration the existing natural conditions in the region. The model accuracy will be based on data inputs such as daily weather data, soil characteristics, and crop management.

The model should be developed for scenario assessment. The model will be used for strategic analyses for long-term planning, tactical analyses for -seasonal management as well as for simulating the potential impact of climate change on crop production, resources use, and environmental impact on selected pilot areas in the region.

**Objectives:**

The goal of these Consulting Services is to build the capacity of hydrometeorological services staff on the use and application of crop simulations models for crop yield prediction. Specific objectives include the following:

1. Organize training workshops on crop modeling;
2. Support local specialists who will attend the regional training workshops on crop yield prediction (distance consultation);
3. Develop an introductory online course on the application of crop modeling for crop yield prediction;
4. Deliver an analytical report on the application of crop models for the selected territories in collaboration with local specialists based on the research outcomes.
5. **Specific Activities:**
6. **Organize at least two regional training workshops on crop modeling**

The Consultant will develop the capacity building program, which will be also agreed with CAMP4ASB RCU. The capacity building program will be developed based on the interests and the needs expressed by the local specialists and in consultation with CAMP4ASB RCU. and will include at least two workshops and continuous technical support throughout the duration of the project (activity ii). The first workshop will introduce the concepts of systems analysis and modeling and the operation of the model. The second workshop will introduce the application of the model with local data provided by the specialists and will discuss climate change applications. During the workshop, the participants will develop their own case study on selected pilot territories. The forecast outcomes will be used for further research and publication of analytical report (activity iv) and will discuss seasonal yield forecasting applications. Evaluations of the workshops and capacity building program will be conducted. The evaluations will take place before (diagnostic evaluation), during the training (formative evaluation), at the post-conclusion (summative evaluation). The consultant will develop a detailed evaluation of the modules/workshop(s) by the participants so that the workshop/training materials can be improved according to the participant feedback.

The logistics for the participants of the regional training will be supported by the project’s RCU.

* Outputs for this activity will include: An outline of the training courses and content for each regional workshop;
* A short description of the proposed topics and expected outcomes;
* A plan for the evaluation of the training.
1. **Provide technical support to local specialists on crop yield prediction**

Following the first regional training workshop, the Consultant will provide technical support for the specialists from the hydrometeorological services who attended the training. The technical support consist in providing consultations to the specialists of hydromet services in mastering the model on the selected pilot areas. This technical support will be provided through e-mail exchange and one-on-one sessions using either Skype or Zoom technology that allows screen sharing over the contracting period.

1. **Develop an introductory online course on the application of crop modeling and model for crop yield prediction**

Following the first training workshop, the Consultant will prepare an introductory crop modelling system video course (webinar) including a short description, structure and themes etc. The course will be uploaded and served from the Central Asian Climate informational platform (CACIP)

1. **Produce analytical report on the application of crop models for the selected territories in collaboration with local specialists based on the research outcomes.**

The second regional workshop will focus on the application of the model for regional yield prediction in Central Asia including climate change applications and seasonal yield forecasting. During these two regional workshops, the pilot agricultural areas will be indicated with the National Hydrological and Meteorological Services (NHMS), and other responsible agencies (e.g. Ministry in charge of agriculture, water, etc.) in Central Asia. The Consultant, in collaboration with trainees and their institutions will prepare an analytical report based on the outcomes of the crop modeling approach in the selected agricultural areas. This report will be shared with the broader audience through CAREC’s platforms.

1. **Scope of Work - Tasks, Deliverables and Schedule**

The following deliverables will be produced in this consulting service:

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| **#** | **Deliverables:** | **Timeline:** |
| 1 |  Training program including applications on crop modelling for the first regional technical workshop; prepared associated exercises. | March 30, 2020 |
| 2 | First 5-days regional technical workshop.  | May 20, 2020  |
| 3 | Continuous technical support for workshop participants. | Over the contracting period |
| 4 | Report on the first technical workshop.  | May 30, 2020 |
| 5 | Detailed evaluation of the workshop’s participants on the level of the course mastering through online evaluation form. | June 15, 2020 |
| 6 | Improved training materials for the first workshop.  | June 31, 2020 |
| 7 | Developed training program with applications on crop modelling for the second regional technical workshop; prepared associated exercises. | July 31, 2020 |
| 8 | Developed climate change scenarios for implementation in the crop model. | September 20, 2020 |
| 9 | Second 5-days regional technical workshop. | August 30, 2020 |
| 10 | Report on the second technical workshop. | September 10, 2020 |
| 11 | Detailed evaluation of the workshop’s participants on the level of the course mastering through online evaluation form. | September 15, 2020 |
| 12 | Improved training material for the second workshop. | September 31, 2020 |
| 13 | Concept note on introductory online course on crop modeling. | September 31, 2020 |
| 14 | Webinars based on agreed concept note; uploaded and served on the informational platform CACIP | December 31, 2020 |
| 15 | Seasonal weather scenarios for implementation in the crop models | November 15, 2020 |
| 16 | Respective analytical report based on the research outcomes of the crops modeling developed; consolidated report on crop modelling for selected pilot agricultural areas is submitted. | December 31, 2020 |
| 17 | Local specialists from the national hydrometeorological services in Kazakhstan, Tajikistan, Turkmenistan and Uzbekistan have received support in development/finalization and evaluation of crop yield predictions for selected agricultural territories. | March 30, 2021 |
| 18 | Participation and presentation at climate related events organized by CAMP4ASB`s RCU.  | Over the contracting period |

1. **Qualification Requirements**
* At least two specialists with PhD degree in agriculture, environmental science, and other related fields;
* At least five years of experience in the field of dynamic crop growth simulation models;
* Proven experience (at least 5 years) in the development of relevant software tools and methods;
* Excellent understanding of the target audience and user perceptions in Central Asia;
* Demonstrated experiences and skills in facilitating stakeholder/working group consultations and training;
* Language skills in English. Russian is preferable.
1. **Reporting Requirements**
* The Consultant should report to the RCU Coordinator.
* The estimated duration of the consultancy will be March, 2020 – March 30, 2021