

Implementation Plan Table of Contents

1. Executive Summary (1 page) **updated annually**

This section will appear in the main GEO Work Programme document presented to GEO Plenary.

- Full title of the Community Activity: **Global Agricultural Drought Monitoring**
- Short title or acronym (all capital letters, maximum of 20 characters). **GADM**
- Proposed or existing category (i.e. Community Activity). **Community Activity**
- **Overview** (summary of section 2 below).

The proposal of the Global Agricultural Drought Monitoring aims at coordinating the agricultural drought issues, jointly develop the method of monitoring agricultural drought towards a global coverage and finally support the GEOGLAM project with timely agricultural drought information at the meantime understand the process and impact of agricultural drought development in the background of global change and provide the adaptation advices for the community.

- **Planned activities** (summary of section 4 below).
 - Inventory of the current agricultural monitoring systems at regional and global level in the world;
 - Development of the best practice of agricultural drought monitoring with remote sensing;
 - Coordination of the global agricultural drought monitoring systems towards a coordinated global agricultural drought information release;
 - Regional showcases on agricultural drought monitoring, possible in Asia;
 - Promote the international funds and national fund to support agricultural drought monitoring proposals;

· **Points of Contact** (primary contact persons for the Community Activity and their email addresses).

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2. Purpose (1 page)

- Rationale (i.e. evidence of need) for the Community Activity.

Drought is the most common and costliest natural disaster, and has adversely affected water resources, agricultural production and welfare of people in the world. Timely and

accurately monitoring drought and its impact on agriculture in the background of the global warming is essential for the decision making in terms of food security, water resources security and as well as the international aid to the affected areas.

In the past, the Meteorological drought monitoring has been given more efforts so that the methodologies and the models are quite successful at presents. However, the agricultural drought monitoring and evaluation still remains a very challenging problem to provide worldwide users with timely, on-demand, and ready-to-use agricultural drought data and information. The availability of various near real-time global remote sensing data promises a solution to the problem with the development of a global agricultural drought monitoring and loss assessing system integrating with remote sensing data and in-situ data.

The proposal is aiming to set up a global mechanism to coordinate the global agricultural drought monitoring systems, significantly improves global agriculture drought monitoring technology and jointly overcomes the most limitations of current agriculture drought information that be expected to provide to the international bodies, including GEO, WMO, FAO, IPCC etc. as well as national users.

Actual and/or planned outputs of the Community Activity (i.e. data sets, open methods, information products or services, or other openly available results intended for external users) and their geographical scope.

The outputs from this proposal will be periodical agricultural drought information online. The final outputs should be the global coverage.

Actual and/or intended users of the outputs and the expected types of decisions these outputs are expected to inform.

The intended end users will be national users from agriculture, meteorology, water resources and disaster relief sectors as well as the international users (GEO, WMO, FAO, IPCC etc.).

3. Background and Previous Achievements (½ page) optional

If this is a new proposal:

If the proposal emerged from, or is related to, an existing GEO Flagship, Initiative, Community Activity, Community of Practice or other GEO activity, please describe this relationship.

For Community Activities already in the GEO Work Programme: Status of implementation of planned activities and outputs for the 2017-2019 period.

Global Agricultural Drought Monitoring was already in GEO Work Plan 2017-2019. The task team was mainly from Asian and the activities was carried out in Asia as well. The Team took the occasions of the GEOSS AP symposia during 2017-2019 and promoted the drought mechanism in Asia with the UNESCAP. Mongolia and Sri lank were the pilot case study areas and have built their own drought monitoring systems with the support partially from this task. One training workshop was organized in the Beijing Normal University in 2017 which brought around 20 participants from Asia and Africa. In the large community, the FAO is running a remote sensing based agricultural drought monitoring system. The NOAA is

producing the drought indices, such as VCI, TCI and VHI in global coverage. The Chinese community is producing the ET based drought monitoring covering the region or the global in coarse resolution. These efforts are expected to be coordinated through GEO framework in the new GEO work plan.

4. Key Activities (1 page)

· Summary of key planned tasks to be undertaken by the Community Activity during the 2020-2022 period.

- Inventory of the current agricultural monitoring systems at regional and global level in the world;
- Development of the best practice of agricultural drought monitoring with remote sensing;
- Coordination of the global agricultural drought monitoring systems towards a coordinated global agricultural drought information release;
- Regional showcases on agricultural drought monitoring, possible in Asia;
- Promote the international funds and national fund to support agricultural drought monitoring proposals;

5. Relationship to GEO Engagement Priorities and to other Work Programme Activities (½ page) optional

Description of which activities and/or outputs of the Community Activity, if any, are expected to inform the achievement of SDG targets and/or the measurement of SDG indicators. Identify which targets and/or indicators are implicated. (*See Appendix 1 for a table of SDG targets and indicators that have been identified as most relevant to Earth observations. Other SDG targets and indicators not included in the table may also be identified.*)

The output global agricultural drought information will be expected to contribute to the achievements of the SDG Goal 2 End hunger, achieve food security and improved nutrition and promote sustainable agriculture and Goal 15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. The output agricultural drought indices data may be able to provide a direct measure the indicators of 2.4(By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality) and 15.3(By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world).

Description of which activities and/or outputs of the Community Activity, if any, are expected to support the Paris Agreement and identify which pillars are implicated. (*See Appendix 2 for the five pillars of the Paris Agreement where potential for contribution by Earth observations has been identified.*)

The output global agricultural drought information will be able to support the Paris Agreements in the field of the adaptation and loss and damage evaluation. The information may help countries to take agricultural production adaptation strategy to reduce the crop production loss due to the drought.

Description of which activities and/or outputs of the Community Activity, if any, are expected to support achievement of the targets of the Sendai Framework and which targets are implicated. (See Appendix 3 for the Sendai Framework Targets.)

The output global agricultural drought information will directly support the achievement of the targets of the Sendai Framework. The agricultural drought information may help farmers to enhance the crop monument so as to reduce direct disaster economic loss and substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people.

List of Flagships, Initiatives and Community Activities in the 2017-2019 GEO Work Programme that are relevant to this Community Activity and a brief description of the relationship or plans for future engagement / collaboration.

In the 2017-2019 GEO Work Programme, Global Agricultural Drought Monitoring was expected to enhance the cooperation with GEOGLAM initiative. However, this task was not well fit the structure of the GEOGLAM. The relationship will be enhanced during the new work plan programme.

6. Governance (½ page)

Description of the governance structure for the Community Activity, including the mandates of steering/advisory/management committees, if applicable.

The proposal will be led and carried out by a group of task team. The major subtasks will be coordinated by one of task leads, respectively. The management committee is not applicable at present and may be proposed later on if it needed as the task develops.

- Description of the roles of key leadership positions in the Community Activity.

CMA: coordinator of the entire task and lead of Inventory of the current agricultural monitoring systems at regional and global level in the world;

BNU: lead of Development of the best practice of agricultural drought monitoring with remote sensing;

UNESCAP: Coordination of the global agricultural drought monitoring systems towards a coordinated global agricultural drought information release;

CAAS/CMA/IWHR: lead of Regional showcases on agricultural drought monitoring, possible in Asia;

NRSCC/GEO SEC: In Charge of promoting the international funds and national fund to support agricultural drought monitoring proposals;

International partners are invited to lead or coordinate relevant subtasks.

7. Data Policy (½ page)

Policy of the Community Activity regarding data availability, including degree of

adherence to the GEOSS Data Sharing Principles and GEOSS Data Management Principles.

The major coarse resolution satellite data and relevant data products in the world will be used to retrieve the agricultural drought information. The input satellite data will come from US's MODIS/VIRRS, European Sentinel3 and Chinese FY3 MERSI. All these satellite data are currently in line with the GEOSS Data Sharing Principles and open access to users online. Therefore, the retrieved agricultural drought information will be also open access to users online fully adhering to the GEOSS Data Sharing Principles.

Description of how the outputs of the Community Activity, and the methods used to produce them, will be made accessible, including relevant URLs or permanent identifiers .

The output of this proposal will be published online and the end user may be accessible via the internet, mobile apps. The data and information retrieval will be carried out by the task team with their own computer facilitate or cloud Infrastructure.

Tables (use downloadable spreadsheet for data entry) **updated annually**

A. Individual Participants

B. Confirmed Contributions

Annexes (additional annexes may be added as required)

I. Acronyms and abbreviations

II. Brief CV of Project Leader(s)