



Global
Long-Term
Agricultural
Experiment
Network

Documentation

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The Global Long-Term Agricultural Experiment Network (GLTEN)

Terms of Reference - ToR

Background

A growing population and rise in the demand for food is driving the intensification of agriculture and worsening the associated negative socioeconomic and environmental impacts. The biological, chemical and physical processes that determine the sustainability of food production systems often have complex interactions and are extremely challenging to interpret at a single site over a short-time scale. Additionally, they may operate differently in distinct geographic areas and on time scales of years or decades. Finally, whereas there is a large body of evidence on the impact of the relationships between a single management intervention on a sustainability metric at single sites, the generality of these relationships and trade-offs between multiple sustainability metrics is often unknown.

With large and high-quality datasets, long-term agricultural experiments (LTEs) can address these challenges and provide a unique opportunity to identify opportunities for sustainable land management that balance food production with minimising environmental impacts. Currently, the LTEs datasets are often fragmented and seldom applied outside of the limited remit for which they were originally set up. Furthermore, a significant percentage of those datasets can be under-utilised or have yet not been published. Constraints on the wider use of the data include the need for data digitalization; data access; and data harmonization. An important first step in overcoming these barriers is to make data interoperable across large geographic areas screening a wide range of soils, crops, land management and climatic conditions to gain a better and novel understanding of system function.

Mining the LTEs' datasets can potentially empower the pursuit of sustainable food production systems. However, an ongoing and efficient action is crucial to rationalize the access to data and facilitate joint analyses. A global partnership committed to delivering improved interdisciplinary approaches would also act as an effective vehicle for impacting on the decision-making framework. Thus, a holistic and pragmatic initiative engaged in exploring the trade-offs and synergies connecting systems sustainability and food production can play a significant role in narrowing the gap between polarized public debates on future farming and other vital human needs.

Rationale

In May 2018, The Global Long-Term Agricultural Experiment Network (GLTEN) set out the aim of establishing and supporting a collaborative network among the international community carrying out research through LTEs. The scientific findings from these global LTEs enable the identification of factors influencing the sustainable intensification of agriculture worldwide and can contribute to addressing related Sustainable Development Goals (SDGs - United Nations). The GLTEN is committed to making the LTEs metadata collection available online under a FAIR Data Principle (findable, accessible, interoperable, and re-usable).

Purpose

The purpose of the GLTEN is to identify the factors which are essential in designing approaches for sustainable intensification of agriculture and draw robust conclusions using meta-analysis. By hosting metadata in the GLTEN Metadata Repository, the visibility of global agricultural LTEs will be enhanced. Moreover, the GLTEN will support and foster new collaborative research among the community and revitalize the access to the LTEs datasets worldwide.

Function

1. Provide metadata from global LTEs utilising common standards for LTE metadata documentation including file formats and ontologies;
2. Apply and ensure FAIR Data Principle (findable, accessible, interoperable, and re-usable) and improve linkages among metadata and datasets from different LTEs using a common metadata schema to provide means to share, retrieve, and re-use datasets with citable DOIs/PIDs (Digital Object Identifier/Persistent Identifier);
3. Support and facilitate the identification, assessment, and retrieval of long-term agricultural experiment datasets that can be combined in meta-analyses to address SDGs.

Membership and Accountability

The entry of metadata on the GLTEN-metadata repository automatically leads to GLTEN-membership subject to agreement to the GLTEN-ToR.

Governance and maintenance

The GLTEN is managed by the GLTEN-steering committee supported by the GLTEN-project. The success of the network is dependent on its members and it is for this reason every member's contribution is essential to support the continuity of the GLTEN.

GLTEN steering committee role

The GLTEN-steering committee is responsible for: **a.** ensuring the quality and efficiency of the GLTEN system by sharing expertise, monitoring the system status, compiling recommendations for improvement, **b.** ensures implementation of the recommendations by providing mechanisms, tools, resources, and support of the process; **c.** facilitates collaboration and facilitates joint projects by maximizing synergies.

GLTEN project team role

The role of the GLTEN project team is as follows: **1) Coordinator** – **a.** ensures well-coordinated GLTEN plans by liaising the GLTEN activities; **b.** files updated documentation; **c.** facilitates efficient communication flow among GLTEN-members; **d.** organises meetings as required; **e.** summarises the network activities throughout a GLTEN Annual Report; **f.** promotes the GLTEN visibility keeping updated website and social media updates as well as representing the community in scientific events (posters and talks in conference), **g.** identifies and approaches new potential members for the GLTEN; **h.** fosters scientific collaboration among the GLTEN-members; **i.** identifies funding opportunities to support the maintenance of GLTEN; **2) Principal Investigator** – **j.** chairs the GLTEN-steering committee; **k.** manages financial support to the GLTEN operability.

GLTEN members role

The GLTEN-members are committed to **a.** provide agricultural LTEs metadata to the GLTEN-metadata repository and keep their information up-to-date; **b.** receive and process data access requests applying their own institutional or organizational Data Policy; **c.** contribute to the GLTEN development and implementation making recommendations for improvements; **d.** support the continuity of the GLTEN by voluntarily initiating, developing and fundraising joint LTE-project proposals; **e.** represent the GLTEN among the scientific community.

Acceptance of GLTEN Terms of Reference and GLTEN membership

By signing this document (GLTEN-ToR) you acknowledge and agree to the GLTEN-Terms of Reference and, simultaneously become a GLTEN-member.

Termination of GLTEN membership

The terms of this agreement will continue to apply otherwise it should be terminated by either party with written notice at any time for a grounded reason.

Signatures

Date:

Date:

(signature)

On behalf of GLTEN management team

Name:

Title:

Affiliation:

(signature)

On behalf of GLTEN Data Owner

Name:

Title:

Affiliation (Data Owner):

Definitions, Metadata Policy, and Conditions to Access Data

Definitions

Data: it is any type of measurement and/or information related to the metadata, dataset.

Dataset: is a collection of related data.

Data Owner: is the Institution or Organization - through declared registered contact person - which directly owns and holds the property and know-how associated with data, e.g. experimental design, sampling, analyses, and management of any type of data from specific long-term agricultural experimental site and is a GLTEN-member.

Data Policy: it is an institutional or organizational document that defines the terms and conditions for requesting, accessing, releasing and using the Data Owner datasets and data.

Data Provider: is a declared contact person, assigned as a deputy by the Data Owner, responsible for handling data access requests.

Data Requestor: is any person representing an Institution or Organization (commercial or non-commercial) who request access to any type of data.

FAIR Data Principles: A set of 15 principles aimed at making data Findable, Accessible, Interoperable and Re-usable for humans and machines.

<https://www.force11.org/group/fairgroup/fairprinciples> and, <https://www.nature.com/articles/sdata201618>

GLTEN: The Global Long-Term Agricultural Experiment Network.

GLTEN-project team: are those who compose the board of the GLTEN-project team and execute the roles as described in the GLTEN-Terms of Reference.

GLTEN-member: is the Data Provider who maintains the Metadata from their LTE to the LTEs storage in the GLTEN-metadata repository or the contact person for the Data Owner who has signed the GLTEN-Terms of Reference.

GLTEN-membership: it is the acknowledgment of a Data Provider as a GLTEN-member and it is a declaration of intention that does not include binding commitments.

GLTEN-metadata repository: a searchable online database for managing LTEs Metadata.

GLTEN-steering committee: is the group of representatives designated by deliberated GLTEN-members election who manages the GLTEN. The GLTEN-steering committee is chaired by the Principal Investigator who is supported by four representatives from the GLTEN-members and assisted by the GLTEN-coordinator. The GLTEN-steering committee executes the roles as described in the GLTEN-Terms of Reference.

GLTEN-ToR: is the manuscript detailing the GLTEN-Terms of Reference.

LTEs: are the long-term experiments that are at least 10 years old and are running in agricultural sites.

Metadata: is information that describes data or a dataset.

Metadata Policy: metadata should be freely available without constraint; therefore, it is published in the GLTEN-metadata repository under CC0 1.0 Universal, (CC0 1.0) Public Domain Dedication license.

<https://creativecommons.org/publicdomain/zero/1.0/legalcode>

UN Sustainable Development Goals (SDGs): adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future.
<https://sustainabledevelopment.un.org/?menu=1300>

Metadata Policy

As a facilitator, the GLTEN ensures the integrity, preservation, and accessibility of the LTEs metadata and provides a mechanism for researchers to find datasets on global agricultural LTEs. The metadata is entered using secure data entry forms provided on the GLTEN-metadata repository and managed using a relational database. Metadata is searchable and viewable via a public area on the GLTEN-metadata repository.

The GLTEN-metadata repository is committed to the principles of Open Science and FAIR Data Principles. Metadata in the GLTEN-metadata repository will be managed using a standardized public domain schema and, where possible, described using existing public domain ontology and controlled vocabulary terms. The LTEs-metadata will be published on the metadata platform in both human-readable formats and as structured, machine-accessible JSON metadata. The GLTEN-metadata repository will, therefore, support metadata harvesting and indexing by third parties such as Google dataset search. This will increase the profile and visibility of LTEs-datasets and enhance their impact on the development of land management interventions and innovations.

Conditions to Access Data

The LTEs-datasets remains the property of the Data Owner. Hence, there are certain conditions to access data, which shall be described in the Data Owner Institutional Data Policy. Additionally, the ultimate decision whether a request to access Dataset and, or their associated information and documentation will be accepted remains strictly at the Data Owner discretion. Whilst the GLTEN facilitates and promotes the accessibility and visibility of its member's LTEs to the global community, the GLTEN-project team offers guidance on the data licensing processes, should it be requested by Data Owner.