Annex 1 - Terms of Reference (TORs)
Consultancy "Develop land use planning and mapping through GIS based spatial analysis"

BCI contract reference	2021-03-SA-ATLA
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1. BACKGROUND

The Better Cotton Initiative (BCI) – the largest cotton sustainability programme in the world – aims to train 5 million farmers worldwide on more sustainable agricultural practices, and account for 30% of global cotton production by 2020. In less than 10 years, the Better Cotton Initiative (BCI) and its partners have reached more than 2.3 million farmers in 23 countries, training them on more sustainable agricultural practices. Thanks to these efforts, Better Cotton accounts for around 22% of global cotton production. We are truly a joint effort, encompassing organisations all the way from farms to fashion and textile brands, driving the cotton sector towards sustainability. BCI aims to transform cotton production worldwide by developing Better Cotton as a sustainable mainstream commodity.

Targeting a long-term transformation, BCI seeks for opportunities to bring its production level approach more towards landscape or jurisdictional approach, which has been increasingly seen as a more sustainable way forward in recent years. Companies have been exploring scalable solutions for meeting sustainability commitments and standards are now looking at how they can support landscape-wide transformation. BCI, as a membership-based organisation working holistically towards cotton sustainability and farmers' wellbeing, is looking into how to develop its standard to have wider impact – a direction which is also in line with the BCI 2030 Strategy.

From an ecological perspective, this point is reinforced by the reality that farms and production units do not operate in isolation but are part of broader, interconnected landscapes. There is little ecological value derived from a well-managed and biodiverse farm situated in a degraded landscape. While certification is an effective tool to recognise good practices at a unit level, it does little to address the challenge of leakage or substitution, whereby certified production shifts destructive production practices to other places rather than eliminating them. Only through a landscape or jurisdictional approach, where mandatory minimum practices are legislated or required, will leakage within a landscape be addressed.

In order to address the problems described above, the Adaptation To Landscape Approach (ATLA) intervention will assist BCI firstly by exploring and subsequently by adapting the BCI standard system to the landscape approach. BCI is aware of what needs to change in order to reach adaptation, however there is still a need to assess how the BCSS (Better Cotton Standards System) should evolve to accommodate such transformation.
The ATLA Project will accelerate the BCI Standard System (BCSS) towards the adaptation of a landscape/jurisdictional approach so that the standard can be applied at a broader scale, placing BCI in a better position to deliver improvement services or strategies beyond

the production unit. The project will further facilitate the process of embedding BCSS within national/regional policies and relevant structures of both Turkey and Pakistan in order to be ultimately applicable on all countries where BCI operates.

2. PURPOSE / OBJECTIVES / TASKS / METHODOLOGY

In the context of the Water Stewardship Programme in Buyuk Menderes Basin (Turkey), the project team develops and implements a BCI workplan on an integrated landscape approach in close collaboration with the global consultant. One of the requirements of this step is spatial analysis through GIS methodology to provide a landscape level baseline against which to report change/impact on BCI Principle 2 – Water Stewardship both in agricultural landscape and in areas of high conservation value.

The general objectives for a GIS analysis in the region are:

1. Spatial analysis of current land use to understand how this has an impact on water and soil quality;
2. Analysis of current status (and baseline for future monitoring) of soil conservation & management;
3. Analysis of current patterns (and baseline for future monitoring) of water use for irrigation (ideally combining information based on imagery with data from the state hydraulic department/agency);
4. Baseline for monitoring the health of the Lake Bafa and B. Menderes Delta wetland ecosystems (presumably combined with ground survey), thereby contributing to ecosystem services analysis and to planning of restoration activities;
5. Review historic imagery with a view to tracking historic change in resource status (field moisture content, water levels in drainage channels, tree cover) and trends in land use over time. Linked to this point, explore potential role for GIS as a tool to help communicate with and influence the Regional Development Agency and perhaps other stakeholders.

All the data collected will serve to create baseline information and get clear understanding of how farming activities are affecting/being affected by time. More specifically, the outputs of this GIS analysis will inform,

1. Establishment of a baseline against which the impact of landscape level interventions under the Water Stewardship Programme in Buyuk Menderes Basin,
2. Analysis of ecosystem services provided by the Menderes Delta and Lake Bafa and planning for restoration activities for these ecosystems,
3. An understanding how changes in land and use may have already influenced soil & water quality, water stress & crop health and ecosystems of high conservation value,

3. EXPERIENCE, SKILLS & COMPETENCIES

The Consultant must have hold following experience, skills & competencies:

- At least 5 years of experience in spatial data analysis;
- Multi-crop study knowledge;

- Ai/ml scripting capabilities for land use classification;
- A portfolio of tools for spatial analysis;
- International team working capacity;
- Collaborative communication.

4. DELIVERABLES

	Description of deliverables	Technicalities (specific tools, software, number of pages, language, etc.)	Quality requirements	Date of delivery
1	Management of points of interest and classification (pollution points, protected areas, discharge places, etc)	- A web platform - 10x10 meter from Sentinel2 data - Machine learning classifiers for land cover classification - Generation of Ture Colour Imagery, Vegetation and Water indexes mapping - Web based GIS platform + dashboard with tables and charts of KPIs like NDVI & NDWI	Ground truthing of representative sample of survey points and features. Integration within GIS of: • Factual and transactional data from WWF-Turkey and BCI • Shapefiles for BCI plots • Coordinates and classification of the main gates used to control water flows, and dates that gates are being opened and closed + vector data from hydraulic department/agency, if available • Other free sources of information (weather data – rainfall, temperatures, hours of sun, etc.), DEM (digital elevation model) of the area, (solar) aspect maps, slope, soil types (among others) GIS layers to include at least: river channels, plots, points of interest, base maps, weather, DEM, aspect, slope, land use, among others Processing of Sentinal data and additional GIS layers to provide: true color imagery and multi spectral indexes, NDVI, NDWI, among others Review of current status, and evolution since 2015 of: • Patterns of land and water use in cotton growing areas, including mapping of field boundaries and identification of pollution points • Health of Menderes Delta and Lake Bafa wetland ecosystems • Soil quality in cotton growing areas	15 June 2021
2	Satellite imagery and GIS maps of the defined area (Söke plain including Key Biodiversity Areas)			30 Aug 2021
4	Analysis of historical satellite data,			01 October 2021
5	Dashboards with specific KPIs with reports on stats and alerts			15 October 2021