MINISTERIO DE CIENCIA E INNOVACIÓN
Secretaría de Estado de Universidades
Dirección General de Programas y Transferencia del Conocimiento

CONSOLIDER-INGENIO 2010 PROGRAMME ANNUAL REPORT

Follow-up report

(This activity report refers to the period January 2008 - December 2008)

PROGRAMME REFERENCE: Consolider TCP, CSD2007-00058
Coordinating Researcher: Prof. Felipe Criado-Boado
Programme Title: Research Programme on Technologies for the conservation and valorization of Cultural Heritage – ACRONIMUS: TCP
Managing Institution[1]:   CSIC
Programme Initiation Date: 2008
Programme Completion Date: 2012

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[1] Managing institution

The follow-up report must be written in English and must conform **<u>strictly</u>** to the following structure and page and font (12pt) size limitations:

I. Summary of key activities initiated by the Programme since the start of the funding period [one page or less]

The goal of the CSC-TCP programme is to contribute towards the development of a **Cultural Heritage Science** in Spain, which does not exist as such due to the fact that the Heritage field is dealt with in specific areas from different disciplines, but lacks an integrated scientific approach. Its general scientific objective is to produce models for the analysis, valorization and intervention of heritage assets that can be formalized for their transference to actors outside of the R&D system (public authorities, enterprises and individuals). The research objectives include Mobile Heritage, Built Heritage and the Cultural Landscape (both rural and urban). The Programme aims to develop advanced technology and procedures to cover all of the different dimensions involved in the Value Chain of cultural heritage: its location > conservation > meaning > valorization > social appraisal > public reception. The acronym TCP summarizes these proposals as "Heritage Techno-Science" (*Tecno-Ciencia del Patrimonio*, in Spanish).

The importance of the Programme is justified by the importance of Heritage in Spain, which includes both its historical value and its value as a cultural resource, and increasingly, as an economic resource. Amongst other things, the programme is aimed at creating an integral network of Reference Laboratories for the study and diagnosis of Heritage Assets and Issues.

In 2008, the development of the Programme was marked by the reception date of ERDF funds at the CSIC (in late Spring), and of the funding corresponding to this year (at the end of December).

This year was basically given over to economic, administrative and scientific management work in order to the set the Programme fully underway, and to be able to develop the planned activity.

A total of five months were required just to announce and process the contracts through the CSIC for the scientific and technical personnel involved in the Programme.

Despite this, the main plans involving the scientific work of the Programme are already underway.

II. Degree to which Programme objectives have been achieved, as measured by the indicators listed in Section 8 of the Implementation Agreement [2] [four pages or less]

The scientific planning for the Programme has been delayed due to the necessity and effort involved in establishing the administrative basis and management structure of the Programme, and its economic management periods.

Another cause of delay was the fact that during the second half of 2008, the research groups of the CSIC included in the Programme (which represent 60% of the Programme, as well as playing a coordinating role) had to draw up their Strategic Plan for 2010-13, something that has required a considerable effort and has obviously distracted them from their research activities. Nevertheless, this delay has been sufficiently compensated, not only because all of the CSIC groups involved have obtained the maximum evaluations in this process, but also, and above all, because this has served to bring forward a series of actions focusing on scientific convergence and restructuring that were included in the Programme, and which therefore increased their organisational structure and capacity for future action. These actions are basically connected with the creation of a Network of Reference Laboratories for Heritage and Archaeometric Research, and which was included in Section 8 of the Implementation Agreement. These actions are detailed below:

1st- The Laboratory of Landscape Archaeology (LAr – CSIC, in Santiago de Compostela, headed by Felipe Criado-Boado, Programme coordinating researcher), has been redefined and restructured as the Heritage Laboratory (LaPa – CSIC) in order to adapt more closely to the objectives of the CSD-TCP Programme and to fully incorporate the new scientific and technical personnel who have been recruited; personnel not only comprised of archaeologists, but instead mainly comprised of anthropologists, historians, software engineers and environmentalists specialized in Heritage.

2nd- Also, the Microbiology and Heritage Group (MICROPATH – CSIC, in Seville, led by Césareo Sáiz-Jiménez, Programme deputy coordinating researcher), has been redefined, to mainly focus on Heritage studies. Its organisational and institutional restructuring process is still not complete.

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[2] Implementation Agreement

3rd- The groups ARQUEOMETAL (Alicia Perea), LAB-TEL (Juan Vicent), EST-AP (Javier Sánchez-Palencia, ARQUEOBIO (Antonio López) and CERVITRUM (M. Angeles Villegas), all based in the same Centre of the CSIC (Centre for Human and Social Sciences, in Madrid, CCHS - CSIC), have been joined together in the same Research Line (led by Javier Sánchez-Palencia), with the same scientific objectives and strategies. This Research Line brings together 23% of the personnel of the CSC-TCP Programme.

4th- The Petrology Applied to Heritage group (PAP – CSIC, led by Rafael Fort), which was previously linked to the Institute of Economic Geology in Madrid, has now been incorporated in the new Geoscience Institute, a Joint Centre of the CSIC and the UCM, and is one of the groups that lead the new institute, and who within which are responsible for leading research applied to Cultural Heritage.

5th- The LaPa – CSIC, based on the existence of a previous tradition of collaboration and convergence, has proposed the creation of an *Associated Unit* between the CSIC and the University of Santiago, with the Group for Environmental Studies applied to natural and cultural heritage (GEMAP – USC, led by Antonio Martínez-Cortizas) and Síncrisis, Research on Cultural Forms (SINCRISIS – USC, led by Marco García-Quintela). The objective of this proposal is to create a Joint Research Unit between the CSIC and the USC for the integral study of Cultural Heritage, combining approaches from Archaeology, Anthropology, History, the History of Art, Earth Sciences and IT. This Unit includes 23% of the personnel on the CSD-TCP Programme. It is still pending official approval as an 'Associated Unit', although in practice it is already functioning, through the exchange of personnel, infrastructures and projects in order to apply the same scientific strategy.

6th- The LAB-TEL – CSIC Group and the Photogrammetry and Remote Sensing Group (GFYT of the Polytechnic University of Madrid, led by Santiago Ormeño), have proposed the creation of a joint UPM-CSIC research laboratory for Archaeological and Heritage Spectrometry, through the creation of an 'Associated Unit' between the CSIC and the UPM. The laboratory has been established in the CCHS – CSIC, as part of the Research Line mentioned in point 3. Work has begun on acquiring the necessary scientific equipment through funds from the CSIC co-financed by the CSD-TCP Programme. This 'Associated Unit' is still pending official approval.

7th- Although it was not initially planned, the awarding and start-up of the CSD-TCP Programme has reactivated the project for the creation of an Institute for Sustainable Heritage Management at the University of the Basque Country (UPV-EHU) based on the

tradition and demonstrated capacities of the Archaeology of Architecture Group (GIAA, from the UPV-EHU, led by Agustín Azkárate). This Institute, known as ZAIN (which in Basque means "to care for, to preserve"), is in an advanced stage of creation, with work already underway to remodel its future headquarters.

All of the actions mentioned above have created the ideal working bases for the development of the CSD-TCP Programme, not only because they make it possible to organise it more effectively by simplifying a structure with 16 different Groups, replacing it with a network with five 'nodes' (**LaPa** –points 1 and 5 above, **CCHS** –points 3 and 6, **CSIC Science Groups** –points 2 and 4, **ZAIN** –point 7, and the **CAAI** – the Andalusian Centre of Iberian Archaeology, from the University of Jaén, which has not undergone any changes), but above all because they concentrate and extend the research capacities of the Programme, and provide it with a more solid and autonomous institutional structure that increases its visibility. This means that in the second year of the Programme, achieving the proposed objectives can be accelerated, compensating for the delays accumulated as a result of administrative and economic reasons.

However, at the same time the Work Plans included in the programme of the CSD-TCP have been set underway. These include four main groups of activities.
ONE: Scientific Research activities that include three Plans: Plan 1, for Joint Scientific Activities, which constitutes the nucleus of the basic research of the Programme (detailed below); Plan 2, on Transversal Scientific Activities, which constitutes the nucleus of applied research (detailed below); and Plan 3, for Demonstration Projects, which includes the vertical activities (this Plan has still not been set underway, as the Demonstration Projects are essentially for validation purposes, meaning that they are designed to evaluate the common procedures and contributions that have been developed, and therefore cannot be set underway when they start;
TWO: Transferring results and knowledge Activities, which include 3 plans: Plan 4, for the Transfer of Results; Plan 5, for Communication and Diffusion (or Scientific culture); and Plan 6, for Training;
THREE: Integration Activities (for fostering interrelations within the Team);
FOUR: Management Activities (or for administration and secretarial activities) of the Team.

Plan 1, for Joint Scientific Activities, includes the following areas: Paleoenvironment; Geoarchaeology and Isotopic Geology; Pollution and Paleo-Pollution; Archaeobiology; Landscape Archaeology (rural and urban); the Analysis of Architecture and Construction; Historical Analysis of Heritage; Documentation and Recording Procedures; Remote Detection and Geographical Information Systems; Information Technology applied to Heritage; Analysis and Characterisation of Materials; and Technologies for Preservation and Restoration.

Plan 2, on Transversal Scientific Activities, includes highly important actions as a mechanism and instrument for the integration of the Programme, and at the same time, as formula for transferral to the field. These include: the generation of a metadata model for the treatment of Heritage; the generation of a protocol model for laboratory operation and management; Strategies and Systems for the contextualisation of samples; the Modelling of the information system of the team; the standardisation of documentation and recording procedures that can be defined as AENOR technical Standards; and the Outlook of the Heritage Sector in Spain.

Work in these areas has already begun and is progressing at a good rhythm, although no results or specific products are available so far to reflect this.

III. Description of the Programme's scientific and administrative management [one page or less]

The coordinating Team (comprised of Felipe Criado-Boado as coordinator, Césareo Saíz-Jiménez as Vice-coordinator and Almudena Orejas as Associated Coordinator), has met three times for the start-up of the Programme.

The Coordination Technical Unit has been created, and its operational guidelines have been designed. Within it, a Management Unit has been defined, and a person has been contracted to carry out the Administrative Management of the Programme (Sofía Quiroga). The base for the work of the Management Unit is in the LaPa – CSIC, in Santiago de Compostela. This Unit has been responsible for supporting all of the scientific and administrative management actions carried out to date. Its specific functions are to support relations with the Groups, with the CSIC and with the other institutions involved, as well as with the MICINN. It is also responsible for requesting and processing supplementary funds for the Programme.

Instructions on programming, implementation and administrative work have been sent to all of the Groups in the Research Team. Based on these instructions, a request was issued to specify the working plans for each Group in an individual file. The structure for controlling activities and producing indicators has been designed, as well as the self-evaluation system for the Programme.

The MU has provided administrative support in order to make points 5 and 6 above viable, and to process the acquisitions of scientific material.

The transfer of funds to the Groups involved in the Programme has been resolved, and in particular, specific agreements were drafted and processed with the University of Santiago and with the University of Jaén for the transfer of funds.

The most important action of the MU, and which required most effort due to being extremely time consuming, was the processing of 23 contracts for researchers and research technicians for the Groups of the CSIC to be charged to the Programme. This process involves requesting authorisation from the CSIC (which, in turn, has to process this authorisation through the MAP), preparing the public call, receiving and evaluating the candidates' CVs, and processing the contracting of the selected candidates. The calls were made according to the current standards of the CSIC, which guarantee the maximum publicity and diffusion of the call, as well as the selection of candidates based on principles of excellence and opportunity. A total of 145 different applications were received from all over Spain (including some foreign candidates). Seven months were required to process all of these contracts. This caused an important delay in the intended working plans, although it is true that this delay has been offset by the fact that the procedure has been carried out with full administrative and scientific guarantees, which are essential in this case.

These contracts include those for the technicians and specialists who complete the Technical Coordination Unit, and who will make it possible to carry out part of the Joint Scientific Activities. Although this team is based in different Centres, it does not depend on any one Group in particular, but instead directly on the Coordination Unit of the CSD-TCP Programme.

IV. Description of budget expenditures, in relation to the Programme objectives and activities and including the budget distribution among the partners [one page or less]

As a result of the accumulated delays, there was practically no expenditure in relation to the Programme in 2008. In fact, in this financial year it was not even possible to transfer the budget to the different Groups, as the Funding from the MICINN was not made available for distribution until the end of December. We received authorisation to go ahead with distributing the Funds amongst the groups that comprise the CSD-TCP Team on 30 December. Work began immediately on transferring the funds to all of the CSIC Centres included in the Programme, as well as to the universities of Santiago and Jaén. No funds have been transferred to the University of the Basque Country as it was considered preferable to put the transfer on hold while point 7 in section II above was organised and processed. Neither have any funds been transferred for the time being to the UPM, as the creation of the Joint Laboratory specified in point 6 of section II implies that most the expenditure will be destined to the CCHS-CSIC.

In the first year, all of the Groups have been given a basic amount of 60,000 euros as a Block Grant in order to cover their commitments with the CSD-TCP Programme and to start their work. However, the allocation of sums in the coming years will be subject to each Group having achieved its objectives. Also, staff have renewable one year contracts, meaning that they will only be renewed when justified by the staff member's working dynamics and results. All of the Groups are aware of these internal control standards, and apply them.

All staff costs derived from the Programme are managed by the LaPa – CSIC, as their total expected cost in the requested budget coincides with the ERDF funds provided to the Programme (3,500 K €). The contracts are managed by the LaPa-CSIC, with the Destination Centre detailed as where the contracted staff member works. This makes it possible to coincide with the basic condition for eligibility of the ERDF Funds, which requires that they must be invested in Objective 1 zones. This measure, which took us several months to make viable, will simplify the justification of these ERDF funds at the necessary time, and will simplify the auditing process.

The remaining funding (1,500 K€) will be transferred to each Group on a yearly basis, and in the name of the corresponding lead researcher. These yearly sums will compensate the university Groups who have to receive the total amount that corresponds to them.

V. Brief description of the Research Activity Plan to be carried out between January 1, 2009 and December 31, 2009, as stated in the Implementation Agreement [two pages or less].

Plans have been made for the first meeting of the Core Group of the Programme to be held in May, comprising the Heads of all of the Research Groups involved in the Programme. This Core Group is responsible for coordinating relations between the Research Groups and the Programme, and for functioning as a Scientific Body to discuss its scientific direction and report on the decisions of the Coordination Team. This meeting will be used to specify the commitments and deadlines of each Group in relation to the research plans of the CSD-TCP Programme.

At the end of the year, a meeting of the External Advisory Board will be organised in order to validate the progress of the Programme and to externally evaluate the internal analysis carried out within the Programme regarding compliance with objectives and indicators.

Apart from this, it is expected that during this year, once the administrative functioning of the Programme has been normalised and all of the working Team has been consolidated, there will be significant progress in the different research subjects involved.

As regards the Transversal Scientific Activities, the aim is to progress in: (i) metadata modelling for Cultural Heritage recording and research based on a spatial interface –SDI, (ii) designing a new type of Information System for Heritage, (iii) defining standards and methodological specifications to deal with Heritage, and (iv) also defining Working Protocols for Heritage Laboratories.

In the case of the Joint Scientific Activities, significant progress is expected in the following areas:

- research on the identification, characterisation and integral management of Cultural Landscapes.
- studying the effect of paleo-fires on the molecular composition of organic soil material and on the evolution of organic material in natural records (peat bogs, lake sediments, soils), for the application of bio-indicators in the reconstruction of paleoenvironments and human activity.
- paleoenvironmental and archaeometric research based on topographic analysis, soil and sediment analysis, palynology and anthracology.
- the design and carrying out of experiments in the field of the digital documentation of heritage assets (synthesis, processing and analysis of multi-spectral images, geometric surface modelling).

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- the structuring of automated data models for the management of spectral and geometric information.
- the study of laser-based methodologies for the analysis, diagnosis and preservation of Cultural Heritage assets.
- the design and creation of portable and/or remote electronic prototypes applied to the evaluation of environmental parameters for the preservation of Heritage assets.
- research on non-destructive portable techniques for Heritage preservation studies: infrared thermography, ultrasound wave transmission speed, sclerometry), colour determination (spectrophotometry), magnetometry.
- research on the biodiversity, ecology and taxonomy of actinobacteria in subterranean environments, and the description of new species of bacteria that affect Heritage assets.
- research on chemistry applied to the preservation of Heritage through experimental, multidisciplinary methodologies.
- the integral study of historic, ethnographic and archaeological constructions using advanced archaeological and topographic methodologies, including the development of models for the recording of architectonic information on Cultural Heritage.
- the study of petrological techniques for the characterisation, analysis of deterioration and evaluation of preservation techniques for natural and artificial stone materials from Cultural Heritage and ornamental Rocks.
- research on technical metalworking processes and the preparation of analytical data for its inclusion in a metadata model with spatial technology.

In the case of the Technical Coordination Unit, work will progress on: (i) creating the archive of the Programme and the database on productivity indicators, (ii) analysing the technological offer and capacities for the Transfer of knowledge from the whole of the CSD-TCP Team, (iii) the presentation of a European project in which all or some of the TCP Groups will take part, taking advantage of recent calls from the 7FP for Humanities and Social Sciences, which open up excellent opportunities for a Team of this kind, (iv) starting activities connected with Scientific Culture and external promotion, as well as contacts with the press and a presence in the media, (v) maintaining shared IT systems, including the public website and Intranet of the Programme, and (vi) designing an Official Post-Graduate Programme in collaboration with the participating universities.

VI. National and international actions carried out in order to increase the visibility of the Programme [one page or less].

Instructions have been given to the whole of the CSD-TCP Team so that all of its researchers sign their scientific production linked with the Programme, and in any event all work that is closely related to it, with official reference to the Programme including its acronym and reference, namely: Programme TCP–CSD2007-00058

Preliminary documentation work and studies have begun to create a graphic design that establishes the corporate image of the Programme, and which, according to the instructions of the MICINN, must include the seal of the MICINN, reference to the Consolider call, and the seals of the participating bodies.

In 2009, contributions based on the Programme will begin to be presented at different Conferences and Scientific Meetings to demonstrate its activity.

The establishment of a common, rigorous policy for the recording of the indicators for the production and success of the Programme will facilitate its visibility.

Also, its visibility will also be increased as a result of the first meeting of the External Advisory Board of the Programme, planned for the end of 2009.

VII. Detected problems and suggestions.

1st- Justification of the contribution charged to ERDF Funds, which represents 70% of the budget, and which is subject to the Programme being carried out in Objective 1 zones; in order to resolve this situation, all of the personnel included in the Programme have been contracted through the IEGPS-CSIC, based in Santiago de Compostela (in Galicia, which is an eligible region for ERDF Funds), although the destination centres are based in other Regions and Cities.

2nd- Including the co-financing provided by the CSIC (1 million euros) in the official budget for the CSD-TCP Programme, as this amount has to be spent according to a Budget in which this amount is currently not included.

3rd- Replacing the contracts included in the Programme project for Group 3 (Research Assistants) with contracts for Group 1 (University Graduates) and Group 2 (Research Technicians).

4th- Modifying the start and end dates for the Programme so that the implementation period coincides with the expenditure periods.

5th- Officially incorporating a Programme Manager.

Based on this report, the aforementioned problems and their proposed solutions will be presented to the MICINN in the next few months.

Date: 5 April 2009

Felipe Criado-Boado
Coordinating Researcher   **Representative of the Managing Institution**

SR. SUBDIRECTOR GENERAL DE PROYECTOS DE INVESTIGACIÓN
Calle Albacete, 5. 28071 MADRID

NOTE: Please be advised that any change representing a modification of the grant concession conditions requires that the Managing Institution submits an application stating a valid reason for the change. This application must be submitted before the project completion deadline has expired and requires the express approval of the designated administrative organ, likewise to be obtained before the project finalization deadline has expired. These applications will be processed separately from the follow-up reports.