

CITAB External Advisory Committee (EAC)

Report on 2015-2017 Activities

Management.

In **2015** CITAB began a transition into a new **Strategic Programme (SP)** that recognised the need to consolidate research strategies with a focus on key research areas, on improving the internationalisation of its research activities and improving the critical mass of the Centre. The Centre conceived a programme of activities around two thematic lines: **Sustainability of Agri-food and Forestry Ecosystems in a Changing Environment (TS1)** and **Technology & Innovation in Agri-food and Forestry chains for a more Competitive Bioeconomy (TS2)**. The three research groups that were part of the activities before 2015: **Sustainable Agri-food chains (SAC)**, **Ecointegrity (EI)** and **Biosystems Engineering (BE)** were, however, maintained.

CITAB receives core funding by FCT of 200K. This is a very low level of basic support for a research institute. The need to seek external funding sources is evident.

It is clear that during the 2015-7 transitional phase management was restructuring the resources to create a more coherent programme with the critical resources necessary to improve overall impact. The 2017 Activities Report demonstrates that this is being achieved and will continue into 2018.

An important recognition in the SP was that CITAB had to address national and international objectives, particularly those found in the EU Horizon 2020 programme, in order to ensure future growth by meeting the priority needs of these and other funding bodies. These objectives were implemented during the period of the current evaluation by the EAC. CITAB has reorganised its R&D activities to more effectively meet the priorities of **TS1 and TS2**. The three distinct research groups have been incorporated into these strands.

Finance.

The Centre has seen its income vary between various funding sources in the period 2015-2017 but has seen a remarkable positive trend. CITAB's income doubled from 2015 to 2017 - a really important achievement for which the members of the Centre are to be congratulated.

Industrial exploitation of R&D in Portugal has always been a weak link in the impact potential of Portuguese S&T. CITAB has clearly demonstrated the ability to strengthen these links. There was a very significant rise in the Centre's income from both international and industry sources in **2017**. This increase in income clearly indicates the ability of CITAB to target its research directly on meeting the economic, environmental and regulatory challenges facing Portuguese industry and society.

On-going projects.

The Reports list all of the projects currently underway in the Centre. For evaluation purposes it would be easier to evaluate the achievements in each year, if the new projects starting in the year under review were separately listed.

17 research contracts with industry are listed in the 2017 Report. 13 of these were started in 2017. This is a significant achievement.

18 on-going **international projects** are tabulated in the 2017 Report, which is an excellent increase over the 12 listed in 2016. This success will apparently continue into 2018. This indicates a very positive trend in internationalisation of the research output and it is commended.

Thematic strands and sub-programmes.

1.1 Integrated monitoring of climate and environmental impacts: adaptation and mitigation strategies.

This area is of major importance given climate change. The research is focussed on tackling the environmental challenges to Portuguese crops and how to maintain productivity and quality. The relationship of some of the projects to the SP could be made clearer.

CITAB have developed an improved model for climate variability at 1km spatial resolution for use in research centres where climate data are required. Hydrological models were coupled to flood risk models for the first time. Atmospheric mesoscale prognosis models also have been developed. A web platform has been created to provide climate and weather services that will incorporate extreme events for application to agroforestry systems. Finally the importance of climate variability in Portugal on vegetative vigour has been assessed.

These are all important contributions to predicting the future impact of climate change on local agricultural systems.

The work on **Adaptation & Mitigation strategies** is an area of crucial importance to the area's economy and with wider applications. It is of high priority.

The prevention of heat and drought stresses to improve yield and quality in local crops is of utmost importance. Examples of the application of this research should be demonstrated in future appraisals.

The work on wood properties does not clearly fit under this sub-topic. The practical applications of this research should be made more evident.

Aquatic ecological assessment is an important area of research given the potential impact of major hydroelectric generation in the local area. Again more information on outputs should be provided in future reports.

The devastation caused by forest fires in Portugal makes research in this area of the highest priority. Similar ecological disasters in Spain could make this an area for future collaborative research thereby increasing overall investment.

1.2 Conservation Strategies and ecological modelling: recovering and improving sustainability in agri- food and forestry ecosystems.

This area encompasses an essential skill base for the work of CITAB and conservation of the Portuguese environment. The work being undertaken by CITAB is directly focussed on the local environment. Nonetheless it is always possible to refine models and the requirement to carry out further refinement should be explained more explicitly.

Agri-food and forestry sustainability research is covering areas of critical importance to the local economy and beyond.

2.1 Innovative technologies and processes.

This sub-programme is very diverse in its focus and is a field where active collaboration with industry is important if the output is to be effectively exploited. It is hard to understand where some elements of this research relate to Thematic Strand 2.

2.2 Valorisation of bio-based products and co-products.

Much of this work is focussed on the production and utilization of local crops and the valorisation of waste materials from their production. It is a research area of high priority.

2.2.2. Biological and toxicological activities

It has been noted in previous reports that the research in this area is somewhat derivative and is not making full use of its outputs. Ultimately the potential health benefits of bioactive plant constituents will require the testing of compounds in vivo. This necessitates active collaboration with clinical science and human nutritional departments since animal models have their limitations and do not necessarily reflect human bioavailability.

2.2.3. Innovation and development of new added-value products

Future Activities Reports should give more emphasis to how the work is innovative and what plans there are to exploit the results.

Impact.

Assessing the impact of research is never an easy task, as much of the economic and social impact cannot be easily assessed within a 5-year time frame.

Project applications under in the EU Horizon 2020 programme are assessed with a strong focus on impact as one of the most important criteria for success. These Activities Reports give no precise idea of what was the expected outcome of the research and how much of this was achieved. More focus should be given to the issue of impact in future Activities Reports.

Previous Activities Reports have provided a detailed list of publications in peer-reviewed journals and their impact factor. Whilst this is an important criterion it is difficult to extract the relevance from a commendable list of publications, presentations, dissemination events and training activities. Future reports should be more concise and indicate more clearly how the annual output reflects the key measures of achievement set down at the beginning of the year under review, and how this compares with previous years.

The **2017** Report has improved clarity in highlighting the importance of the research achievements to stakeholders but much of the detail should be placed in an annex (e.g. List of publications, members of CITAB).

The formation of two spin-off companies in 2017 is the first time that this has been an outcome of CITAB research. CITAB members are to be applauded for this development.

A focus on patenting relevant research has grown in the period under review.

2016 saw an increase in the number of **peer-reviewed papers** over 2015. A total of 129 full member researchers in 2017 published some 197 papers in peer-reviewed journals, which is a higher productivity than in previous years. This is a very positive trend.

The **training** of students is a major output of CITAB with a good number of successful Ph.D. and Master's Theses that show a growing, positive trend.

Research collaboration.

The active collaboration with Portuguese, Spanish and Dutch universities on the topic of agricultural production chains has attracted a large number of Ph.D. students and is

a major new activity which should lead to developments at the cutting edge of this field.

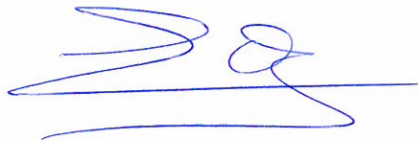
Other collaborations have been started that involve Portuguese-Spanish collaboration in marine sciences and on the increasingly important area of water sustainability. Although this collaboration is a welcome development it will be important not to divert focus from the Thematic Strands of CITAB.

There is no indication that there are a significant number of international appointments to the academic staff or amongst the researchers who do not have permanent appointments. This is a weakness that should be addressed. Whilst the focus of much of the Centre's research is quite appropriately on Portuguese issues, the dynamism of the Centre would benefit from international recruitment.

Dissemination and Outreach.

CITAB continues to actively disseminate its research and is widening the scope of its research nationally and internationally.

The Centre has put in a large effort to engage with all of its stakeholders as well as in **outreach activities** to encourage the local schools and community to become more engaged with the benefits of science and technology and of the work of CITAB in particular. It is also disseminating its research through the popular media.



David G Lindsay
Gregorio Antolín
Jean Marc Chourot

D G Lindsay

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