STSM Report

REFERENCE: Short Term Scientific Mission, COST TD1404 NEOH

Beneficiary
ROBERTO ESPOSITO
Senior expert
Italian National Institute of Health
Rome, Italy

Host
Elena Boriani
Post Doc
National Food Institute, GDSI (Global Decision Support Initiative)
Technical University of Denmark
Copenhagen, Lyngby

Period: 27 November (arrival) to 2 December 2016 (departure)

Reference code: COST-STSM-ECOST-STSM-TD1404-271116-081247

1. Purpose of the visit

The mission intended to contribute to the chapter of the NEOH Handbook on "One Health and Governance". One of the objectives of the chapter is to describe governance mechanisms needed to operationalize multi and trans-disciplinary projects as One Health. Governance of One Health projects needs to be embedded in, and respond to the necessity of the complex nature of these projects.

The purpose of the short mission was to discuss how multi/trans-disciplinary projects (i.e. One Health) can be described and analysed with a systems thinking approach and to identify necessary governance mechanisms. We have examined an example taken from the real world, the Italian dairy chain project ALERT (www.alert2015.it)[1]. The project is based on risk analysis, and its main drivers are the One Health basics, i.e. the web of inter- relationships among environment, farm

[1] The project has the objective to produce safe milk, monitored and checked by a tele-diagnostics system. The innovation consists in the monitoring of the product (through the development of specific bio-sensor) not at the end of the production chain but in continuum, starting from the primary production assessing the exposure to toxic substances and disrupters of **animals, food (milk) for human consumption (human health) and environment** and to advice immediately the breeders and producers which guarantees a timely collection of anomalies, in order to enable and assess immediate corrective actions.

animals and human health, and sustainable food safety to ensure population health"[2].

The ALERT's partners[3], a blend of public institutions and private companies, work together toward the achievement of the same project expected results through the collaboration (multi-disciplinarity) of different disciplines i.e. Toxicology, Chemistry, Veterinary, Biology, Agronomy, Engineering, Zoo and Bio-technology, Economy, Marketing, Management, Business, Electronic-engineering and Information Technology.

2. Description of the work carried out

The mission was undertaken in collaboration with Elena Boriani, Post Doc at the National Food Institute and GDSI (Global Decision Support Initiative). The work done during the mission was based on previous discussions held with Elena Boriani and Simon Ruegg on the definition of system and system boundaries in complex multi and trans-disciplinary projects. Along the discussions with Elena, we found that to **identify, describe and analyze governance mechanisms** with a "systems thinking" approach a "stakeholders analysis" needs to be conducted and the project system boundaries and relationships (links) among stakeholders/actors and involved disciplined have to be identified.

Based on the available documents, teleconferences and exchange of emails with Chiara Frazzoli (ALERT project in Rome), the ALERT project has been defragmented in its main components and, stakeholders/actors and disciplines have been identified. In this context, the definition of ALERT system boundaries and the relationships among its stakeholders/actors were analyzed and described in their basic components. The network of relationships among stakeholders/actors, their actions and the disciplines involved in the project has been identified and summarized in matrix form (datasheets).

Among the different methods used to describe systems with the "system thinking" approach, it has been decided to use a "network analysis"[4] and in particular its graphic representation. To do so, we have contacted Samir Suweis, PostDoc Researcher at the Physics and Astronomy Department, Padova University, Italy. Samir, using the matrix forms that we produced for ALERT, will create a "graphic network" with three interrelated nodes (each node is a sub-system) including the "project clusters", the "stakeholders/actors" and the involved "disciplines". The "graphic network" will be realized using a computer software that needs specific skills and will be ready soon to be analyzed.

---

[2] Frazzoli, C., Mantovani, A. and Dragone, R. (2014) Local Role of Food Producers' Communities for a Global One- Health Framework: The Experience of Translational Research in an Italian Dairy Chain. *Journal of Agricultural Chemistry and Environment*, **3**, 14-19. http://dx.doi.org/10.4236/jacen.2014.32B003

[3] Partners: Italian Institute of Health (ISS), Istituto Nazionale Zooprofilattico della Toscana e del Lazio (IZS), "Latte piu'", Centrale del Latte di Roma (CLR), Leonardo Business Consulting, Italian Research Council (CNR), "Biosensor slr", "AMEL slr" and "Nutriservice slr".

[4] Hanneman, Robert A. and Mark Riddle. (2005). Introduction to social network methods. Riverside, CA: University of California, Riverside).

The analysis of the disciplines network (sub-system) will provide an insight of the project trans-multidisciplinarity including its One Health-ness.

The "system thinking" approach that we utilized, including the definition of the system boundaries and system "graphic network", will allow to identify needed governance mechanisms in complex multidisciplinary projects (One Health) through the identification of stakeholders, their roles and the analysis of their interactions, considering also external causes and how different actors share information or resources among them.

The results of our work on the use of "systems thinking" approach and "stakeholders analysis" to describe governance in multidisciplinary projects (i.e. One Health) will serve to revise the Handbook chapter on One Health and governance.

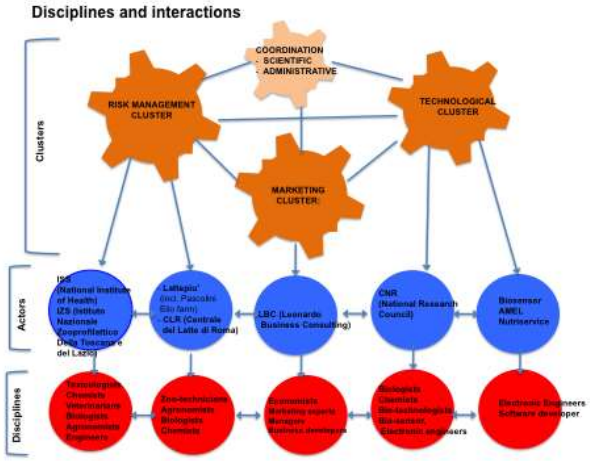
We received comments on our work by Peter Fankte, Associate Professor, Quantitative Sustainability Assessment, DTU Management Engeneering and Liza Rosenbaum Nielsen, Professor, University of Copenhagen.

In particular, Peter Fankte described briefly the work that he has being doing in a UNEP (United Nations Environment Programme) interdisciplinary project, where the governance is so far well organized and produces good organization and relationships within stakeholders and activities.

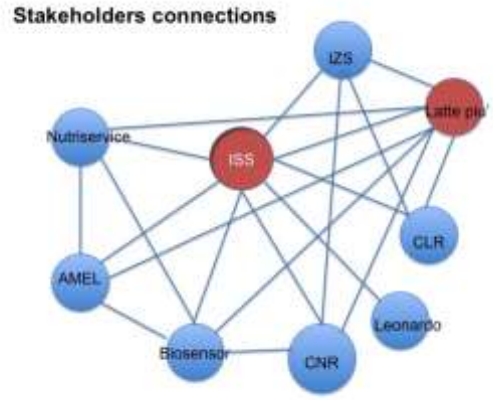
I had also an interesting discussion with Liza and two other researches (Uffe Braae and master of public health student) involved in the evaluation of a One Health project in Tanzania. The two researchers commented on the applicability of the NEOH methodology to evaluation of OH project described in the Handbook expressing some concern, because of its complexity.

3. Description of the main results obtained

The analysis of the ALERT project brought to the identification of the project components, stakeholders/actors and disciplines involved and their interrelationship. The OH interdisciplinary nature of the project calls for trans-disciplinary work as it is shown in the following figure 1:



As an example, the graphic network description of ALERT stakeholders' analysis was conducted manually. The figure (below) represents the identified need of interconnection among the different stakeholders:



As a provisional analysis, it can be said that the Italian Institute of Health (ISS), the coordinating body, and Lattepiu' srl, the final beneficiary, need to establish the most numerous connections, eight and seven connections respectively, with other stakeholders. These can suggest where and which kind of governance systems should be established to allow an effective project implementation.

In the present provisional analysis, external stakeholders e.g. national and international regulatory and control bodies (e.g. EU), relevant public institutions (ministries), private sector, et al. has been not taken into consideration yet, but it will be done in the final analysis. External stakeholders can have important links and relationships with project actors and disciplines in multidisciplinary and/or multisectoral projects, as One Health. They can play a relevant and major role in the

project implementation requiring specific governance mechanisms at institutional an/or private level.

A more complete analysis and understanding on more complex relationships among project components, disciplines and stakeholders will be possible when the comprehensive graphic network will be completed.

The intention of the mission was limited, through the example of ALERT, to describe the methodology of how the system thinking approach can be applied to describe governance issues related to multidisciplinary projects as One Health more than the results of the analysis itself. The methodology will be included in the chapter on One Health and Governance.

4. Future collaboration with host institution (if applicable)

With Elena we will look for possible projects /founds regarding interdisciplinary activities, the evaluation of their results and the governance needed.

Furthermore two draft manuscripts will be produced within the next 5 months (see below).

5. Projected publications resulting or anticipated to result from the STSM

The results of the mission will be included in the revision of the Handbook chapter on One Health and Governance.

With Elena we are collaborating in writing a paper on system boundaries with the title: "System and system boundaries in interdisciplinary activities: case study on primary producers' forthcoming mandate for legal, scientific and ethical responsibility in the European food safety frame (ALERT project)". Authors: Elena Boriani, Chiara Frazzoli, Roberto Esposito, Tine Hald , Simon Ruegg. The aim of the paper is to give concrete elements to describe and analyze complex systems as food chains. The example of "ALERT", Italian dairy chain, where a trans-disciplinary approach is implemented, is described with a systems thinking approach conceptual framework.

We are also planning to prepare a second paper regarding system methodology to analyse governance of One Health initiatives.

6. Confirmation by the host of the successful execution of the mission

The mission was carried out in a successfully mood. Roberto has been progressing in the collaborations for an original and innovative work about governance using diverse methodologies and examples.

7. Financial summary

Expenses	Total expenses in EUR	% covered by NEOH grant (EUR)

Travel (Return air ticket)	474.08 EUR	100% (474.08 EUR)
Local travels[5]	180.50 EUR	14.4% (25.92 EUR)
Accommodation and meals (150 EUR per 6 days)	900.00 EUR	100% (900.00 EUR)
Total	**1,554.58 EUR**	**89.8% 1,400.00 EUR**

Signatures

Date 29/12/2016

Roberto Esposito — Elena Boriani

Grantee — Host

[5] Local travels with train and metro have been particularly expensive because they include travelling to and from Elena Boriani place (she is working part time because she has a newborn of 4 months) and DTU campus that are out of Copenhagen; local travels include also going to the airport and back in Rome.