THE NEED OF THE HOLISTIC APPROACH IN THE MANAGEMENT OF THE COMPLEX SYSTEM CALLED SOLAR SALTWORKS: THE CASE OF MARGHERITA DI SAVOIA SALTWORKS (APULIA, SOUTHERN ITALY)

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EXTENDED SUMMARY

Margherita di Savoia is the largest solar saltworks in Italy and one of the most extensive in the Mediterranean region. Located along the Adriatic coast (41°22′53″ N, 16°05′52″ E) in the province of Foggia (Apulia region, southeastern Italy), with a total area of about 4,00 ha and producing a total of about 5,500,000 quintals of salt per year, Margherita di Savoia is the main salt producing solar saltworks in Europe. The solar saltworks run lengthways, parallel to the Adriatic coast, for a distance of approximately 20 km, with a maximum width of 4 km and cover a surface area of approximately 4,000 hectares, with 3,781 subject to protection. Due to its importance as a habitat for avifauna (waterfowl, wading and migratory birds), it was declared a Natural Reserve in 1977 (managed by the National Forestry Service) and was included in the list of preserved wetlands of international importance (Ramsar Convention). It is a zone of special protection in terms of the Birds directive 79/409/CEE and a site of community importance (Habitat directive 92/43/CEE).

Solar saltworks are the extreme environments for excellence. Extreme because populated by animals and plants who can live and reproduce where few other living organisms can survive. Extreme because extremely beautiful and extremely ingenious is the landscape that man and nature have built together over the centuries, so it was possible the extraction of sodium chloride from the sea. Extreme because it is obvious the volatility of these extremely complex and unstable and, therefore, hardly manageable without a thorough knowledge and technical expertise. In this type of environment also the human work somehow needs to extremized. All powers necessary for the proper functioning of a solar saltworks must have a solid background in their field of competence and then adjust all the standard procedures, materials and methods, which normally are used for their work, to the extreme conditions of the work. The interdisciplinary, the multidisciplinary and scientific approach are finally the weapon in several that man has to manage these vast open-air laboratories.

There is the need of an holistic approach in the management of the complex system called solar saltworks, taking in mind the traditional production process passed down from generation to generation, but not excluding the precious contamination between classics and new disciplines, or those that were once considered alien to the salt production process. The biology applied to the industrial salt production process by solar evaporation of seawater, something may seem antithetical, if you think superficially salt as a bacteriostatic agent. But it is starting from a holistic view of science that some scientists have begun to investigate the complex systems, making new working hypothesis and discovering cause-effect relationships not yet known. Today is widely established and shared, whether in science, both in production, that the quality and the quantity of salt produced is significantly influenced by the biological system of a solar

saltworks. Hypersaline water, once considered lifeless, home to primary producers, consumers and decompositors, like any other ecosystem. This organic contribution to the evaporation process inevitably influences the production of salt.
The holistic approach is a scientific paradigm that emphasizes the study of complex systems. This is not a scientific discipline in itself, but rather defines a philosophical approach that is considered the principle of emergency in applying the scientific method, often using a method widely interdisciplinary or multidisciplinary. This approach is in contrast to the purely analytical tradition, which seeks to analyze the complex systems dividing them in their elementary components and studying the properties separately. The management of a commercial solar saltwork requires a holistic approach that starting from the knowledge of complex concerned, using a multidisciplinary and interdisciplinary scientific method to relate the phenomena of cause and effect are not known, solve problems unresolved and experience working hypotheses not yet covered.
The analysis of relevant literature on the subject and laboratory and field studies, still running at the Margherita di Savoia solar saltworks, gives the possibility to make some general considerations on the state of this area. Currently, the complex system of Margherita di Savoia solar saltworks can not defined in good condition. It is impossible even consider, in a relative way, the current situation by comparing the parameter values with the current sensitive data. There are no historical data organized on sensitive parameters that affect Margherita di Savoia solar saltworks. It is possible however affirm, on the basis of the field study and extrapolating news from bibliographic material differently organized, that the complex system of Margherita di Savoia solar saltworks is currently developing more rapidly. The rapid evolution in a semi-artificial ecosystem unstable on temporal and spatial scale, but very stable in individual compartments, it is alarming and can be very dangerous (because it is directly related to the production process), if not understood in time and managed properly.
On the basis of the premises, the state of the art and the analytical data indicating a system in rapid evolution, is clear the need to make the foundations for a concrete managing plan, based on a holistic approach, that is able to understand and manage properly the complex system of Margherita di Savoia commercial solar saltworks

KEYWORDS: Solar saltworks, production process, biological process, wetlands, Margherita di Savoia, management.