

## A SCIENCE-POLICY INTERFACE: STAKEHOLDERS' INTERACTIVE CONSULTATIONS ON SOIL AND LAND MANAGEMENT RESEARCH NEEDS, THREATS AND POLICIES

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### ABSTRACT

The article describes steps taken by the Romanian National Focal Point within the EU HORIZON 2020 project „INSPIRATION” to raise awareness, contact relevant actors and national funding bodies and get formal support aiming to implement research actions complying with a set of 17 integrated and 22 thematic research themes within the frame of a EU Strategic Research Agenda. One of the main national research funders, the Ministry of Agriculture and Rural Development is looking to an European level cooperation with regard to the topics of „Integrated Environmental Assessment and Soil Monitoring for Europe”, „Bio-Economy – unleashing potential while sustaining soils”, „Farming systems to maintain soil fertility and yields” and „Sustainable management to restore ecological and socio-economic values of degraded land”.

An internal survey among the national stakeholders regarding the most challenging and worth to be financed research needs has revealed certain good overlaps with the those recorded in the Ministry of Agriculture and Rural Development, a clear defined focus on targets related mainly to rural development prospective but also an obvious neglect of the existing urban soil and land issues.

The assessment of the views of the two national stakeholder groups (decision makers/planners as well as employees of local public administration) with regard to soil and land management, carried by a questionnaire-based qualitative approach, emphasize the high awareness of most respondents on the fact that the general public interest on soil issues and soil protection is negligible or even entirely absent. A much stronger commitment and shared responsibility among many stakeholders with regard to soil health and soil conservation is expected. Most of the respondents perceive the current national policies and their enforcement regarding soil protection as inconsistent. The national decision makers/planners view the issue of a Soil European Directive as an important requirement.

**Keywords:** soil research agenda, stakeholder, questionnaire, soil policy, decision maker.

### INTRODUCTION

Pertinent analyses have revealed that in spite of the essential services provided, soil has not permanently received a proper recognition. Reviewed articles on ecosystem services tended to devote very little attention to soils and were initially were left out of the ecosystem services framework (Baveye et al., 2016) or in some other cases, important high level documents do not explicitly discuss the crucial role of soils (Keesstra et al., 2016). Whilst soil and land degradation directly impacts the health and livelihoods of an estimated 1.5 billion of people (FAO, 2011) a comprehensive stakeholder consultation

followed by a European Commission proposal for a Soil Framework Directive (unlike it happened with the EU Water and Air Directives), has failed to address the soil important issue (Glæsner et al., 2014). Still, some of the Member States have enacted comprehensive national soil legislation (Kutter et al., 2011), but not Romania and as a result, among many other important consequences, some national stakeholders have signalled that soil research national funding is and will be further on hindered (Ștefănescu et al., 2016). However, the achievement of soil sustainability and land degradation neutrality, as much as their public acknowledgement, relies on stakeholder

involvement and support. Recent studies have raised the need for research regarding soils on inclusive decision-making and social empowerment, while exploring new or improved ways to achieve real participation of society in the decision (Makeschin et al., 2016). Studying stakeholders' perception to assess communities' knowledge and understanding of a certain issue at stake should be part of the planning process in seeking a wide involvement and promoting dialogue and open communication between the various stakeholders.

An EU HORIZON 2020 project („INSPIRATION") including partners from 17 Member States has underlined the need for new knowledge and new applications to plan, manage and use soil in the light of the proposed 17 United Nations Sustainable Development Goals (SDGs) by establishing and promoting the adoption of a European Strategic Research Agenda (SRA) for land use, land-use changes and soil management in the light of current and future societal challenges (Bartke et al., 2018).

The SRA methodology was based on a bottom-up multi-stakeholder, multi-national and interdisciplinary approach (Makeschin et al., 2016) and covered the diversity of land and soil stakeholders (public bodies, business, science, society and research funders/decision makers). More than 500 national key stakeholders across the various soil and land management fields have been involved to identify national research and innovation (R&I) needs. The interface to engage with all stake-holders was the National Focal Point (NFP) set in each of the European countries involved in INSPIRATION (Brils et al., 2016). Following an intensive stakeholder engagement process, a set of 17 integrated and 22 thematic research needs have been highlighted as top research priorities. The thematic needs have been identified for Natural Capital and Ecosystem Services Supply (NC), Demand for Natural Capital and Ecosystem Services (D), Land Use Management (LM) and Net Impact (NI). The integrated needs (IRT) cut across these themes (Nathanail et al., 2018). The SRA was designed to both attract research funding

by public and private parties and ensure that knowledge is widely applied by public sector bodies, small, medium and large enterprises. It was particularly intended to be used by research funders to identify research activities they would like to collaborate in funding as well as to help public and private research funders identify research they should invest in to innovate and contribute to a greener, more socially cohesive, smarter and more competitive Europe.

Based on wide consultations, the project management decided that the INSPIRATION SRA was to be available as a web-based, electronic version at [www.inspiration-agenda.eu](http://www.inspiration-agenda.eu). In order to facilitate matchmaking of implementation partners, INSPIRATION organized events where potential national funders could meet and share their common interests and funding priorities (Bartke et al., 2018).

As stakeholder views are particularly important for understanding their values and needs, a new national project (recently developed by the former „INSPIRATION" Romanian team) has continued and extended in Romania the previous „INSPIRATION" project work with a questionnaire based investigation focused on the stakeholders' perception regarding soil and soil policy issues, aiming to explore views with regard to soil quality, soil threats as well as the existence and effectiveness of the national and European policies on soil protection and to provide some ideas for a follow up national campaign on soil awareness. The present paper presents the preliminary results of the survey with particular focus on the shared views of the decision makers and representatives of local public administration.

## MATERIAL AND METHODS

In Romania, the NFP was established within the National Research and Development Institute for Soil Science, Agro-chemistry and Environment-ICPA Bucharest, simultaneously with other NFPs set in 16 countries, engaged in building-up a EU level platform with relevant stakeholders across the Member States (Ștefănescu et al.,

2016). In the early stage of the Project, a first round of the NKS views, needs and research priorities assessment regarding land use, land-use changes and soil management has been implemented using a qualitative as well quantitative approach, questionnaire based, using a template developed by the Project (Brils et al., 2016). The information collected has fed the process of clustering the of national research priorities. The first findings of the process were thoroughly verified through dialogue and discussion with relevant funding bodies across Europe (Bartke et al., 2018). In Romania, the final version of the SRA (Nathanail et al., 2018) was distributed to the national research funding institutions and discussed within a national workshop, organized in 2017 and aimed to spread the word and raise awareness on the SRA and to better connect the national funding bodies to the identified research needs. During the event, a simple questionnaire listing the SRA research needs was distributed among participants to assess their individual views about the most important topics of SRA. Meanwhile, the NFP started the match-making process by contacting key persons from the national funding bodies to assess their willingness to contribute with co-funding to the trans-national research themes. The results of the match-making process were accordingly converted into inputs in the electronic version of INSPIRATION SRA available on [www.inspiration-agenda.eu](http://www.inspiration-agenda.eu).

The investigations on the views of the stakeholders with regard to soil and land management were carried by a questionnaire-based qualitative approach (survey). The questionnaire was designed and structured on direct questions and semi-ended (mixed) questions with single or multiple answers. Regarding the meaning of the questions, the questionnaire included factual, opinion, knowledge and control questions. Most of the questions in the survey were multiple choice questions in order to facilitate their completion by participants, thus, for some of the questions multiple answers were allowed. There were also few open questions asking

the interviewees to give free text answers. According to some other successfully implemented methodologies (Koschke et al., 2014), a prior pre-testing implementation phase allowed some lacks of clarity and some ambiguities to be eliminated before the survey was launched. The questionnaire was directly managed and applied „face-to-face” with the respondent stakeholders.

The initial sample comprised 140 respondents (national stakeholders) out of which 10 decision makers/planners and 16 representatives of local public administration, the respective two stakeholder groups being targeted by the present paper. The rest of the sample captured the views of land users (farmers), researchers (soil scientists), university professors (with competences on soil science/land management), experts from county soil survey offices or consultants from agricultural advisory bodies and representatives of environment and agriculture associations, foundations or NGOs. The respondent decision makers/planners (ranked from head of department/direction up to the level of Secretary of State) are employees of the following public bodies: Ministry of Agriculture and Rural Development, Ministry Of Research and Innovation and Ministry of Environment. The representatives of local public administration were approached from the willing to answer employees of the local municipalities (land compartment officers and mayors) and local agricultural paying agencies (in the counties of, in alphabetically order, Argeș, Bacău, Buzău, Caraș-Severin, Călărași, Cluj, Constanța, Dolj, Iași, Ilfov, Mureș, Olt, Teleorman, Vrancea as well as Bucharest City).

## RESULTS AND DISCUSSION

### Match-making process with research funders/decision makers

The first important outcome of the national match-making process carried in Romania followed a two-round meeting held at the quarters of the Ministry of Agriculture and Rural Development, on August 7<sup>th</sup> 2017

(information and European SRA presentation stage) and later, on September 6<sup>th</sup> 2017 (decision stage, after a careful consultation of the SRA in the Ministry), with the Sub-Secretary of State and the Head of the „Extension, Advice, Research, Innovation and Vocational Training” Service. The Ministry currently supports a bidding based agricultural research program, research themes being contracted till end 2018. The Ministry was open to join the SRA starting with early 2019. The amounts of allocations proposed for joining SRA will be phased/spread along 2-3 years contracted period. There were two requests of the Ministry regarding funding themes within SRA: (i) the proposals should have a focus on applied research and (ii) the proposal should have European relevance.

The first selected theme of the SRA was for IRT-1: „Integrated Environmental Assessment and Soil Monitoring for Europe”. The Ministry of Agriculture and Rural Development is currently undertaking a research contract for a national level „Soil Monitoring System”. The Ministry is willing to allocate additional 50,000 euro whether the soil data are to be integrated and processed under a European project (as formerly happened within EU projects like TAIEX, ESB – „Trace elements and organic matter contents of European soils”, JRC - „Soil profile analytical data base for Europe” a.o.). There are possible connections with N1: „Developing impact assessment methodology” and NC1: „Quantity, quality and health of soils, soil carbon, greenhouse gases” of the SRA.

The second selected theme was IRT-4: „Bio-Economy – unleashing potential while sustaining soils”. The Ministry of Agriculture and Rural Development is willing to provide funds in amount of 200,000 euro for research aiming to improve the taking into account of the soils productive capacity with regard to diverse environment and climate conditions. There are possible connections with D1: „The 4 F’s: Food, feed, fibre, (bio)fuel” and LM2: „Climate change challenges for land management” of the SRA.

The third selected theme was IRT-7: „Farming systems to maintain soil fertility and yields”. Organic farming has

become an important aspect of the European agri-environmental policy and the growth potential of the organic sector in Romania is considered to be significant. The Ministry of Agriculture and Rural Development is looking to allocate funds in amount of 300,000 euro for joint proposals regarding improved management in organic farming, a wider range of certified crops and crops seeds as well as new certified inputs in organic farming. There are possible connections with NC2: „Biodiversity, organismic and genetic resources” and NC7: „Intrinsic values of soils and landscapes” of SRA.

The forth selected theme was IRT-15: „Sustainable management to restore ecological and socio-economic values of degraded land”. According to the Ministry statements, almost 5 mil. ha of the agricultural land in Romania are covered with permanent grasslands whilst at least half of them are affected by degradation (e.g. erosion) and over-grazing. The Ministry of Agriculture and Rural Development will make available 300,000 euro for research aimed to provide viable solutions to mitigate grasslands degradation, to provide grassland ecosystem restoration and improved pastoral land settings with regard to spatial planning. There are possible connections with NC5: „Prevention of erosion and mudslides” and LM4: „Land as a resource in rural areas (Multifunctionality of rural areas)” of the SRA.

Later on, during the meetings held at the quarters of the Ministry of Research and Innovation in November 1st 2017 with the General Director of the General Directorate for Transfer and Infrastructure R&D&I and the General Director of the General Directorate for Policies and R&D&I Programmes, the NFP has recorded a certain interest of the Ministry of Research and Innovation to join the Strategic Research Agenda. The Ministry will look further to find and develop proper solutions for Soil-Sediment-Water research co-funding. At a first sight to the SRA’s content, the Ministry of Research and Innovation was inclined to contribute for research concerning the management of risk induced by climate

change on soil resources under IRT-17: „Improving preparedness and response for climate change and related hazards”. Currently, there is no feed-back registered yet as interest for SRA co-funding from the Ministry of Environment.

### Stakeholders' views on the soil and land management research agenda

Meanwhile, a National Workshop was organized in Ostrov, Romania, in October, 5<sup>th</sup>-6<sup>th</sup>, 2017 with 27 participants (soil science researchers, agricultural consultants, farmers and research funders/decision makers). During the event, the participants shared their views (individual votes by ticking research themes, quantitatively non-restricted) with regard to the importance of each topic of the set of 17 integrated and 22 thematic research needs of the European SRA.

The votes were spread almost on the entire SRA. The most voted (12 votes

meaning 44% of the respondent stakeholders) was IRT-14: „Emerging contaminants' in soil and groundwater – ensuring long-term provision of drinking water as well as soil and freshwater ecosystem services” and LM 2: „Climate changes challenges for land management” (Figure 1). Two of four integrated themes (50%) selected to be funded by the Ministry of Agriculture and Rural Development, were placed in the top of the most important research themes in the view of the participants. However, within the European SRA, there are at least 8 clear defined urban development topics (IRT-9, 10, 11, 12, 13 and 16, D-3, LM-3) and none of them received a significant attention from the stakeholders. This is an issue of concern under the emerging pressures on the urban settlements area in Romania, as well as the existing chaotic suburban sprawl (Olivier, 2014). Soil must be safeguarded by a careful rural, as well as urban spatial planning (Nathanail et al., 2018).

1	IRT-14: Emerging contaminants' in soil and groundwater – ensuring long-term provision of drinking water as well as soil and freshwater ecosystem services	12
2	LM 2: Climate change challenges for land management	12
3	NC1: Quantity, quality and health of soils, soil carbon, greenhouse gases	11
4	NC5: Prevention of erosion and mudslides	11
5	LM 4: Land as a resource in rural areas (Multifunctionality of rural areas)	11
6	NC4: Pollutant degradation, filtering and immobilization capacity	9
7	D7: Health and quality of life (living environment)	9
8	IRT-5: Integrated scenarios for the Land-Soil-Water-Food system under societal pressures and challenges	8
9	IRT-7: Farming systems to maintain soil fertility and yields	8
10	IRT-15: Sustainable management to restore ecological and socio-economic values of degraded land	8
11	NI 1: Developing impact assessment methodology	8
12	NI 4: Science-Policy-Society Interface	8

Figure 1. The most important SRA research themes (votes number) as seen by the Romanian national stakeholders, Ostrov, October 2017

### Central and local public administration perception on soil threats and policies

Since soils are threatened by a wide range of processes, multiple options were given to the respondents to answer to the question „which are, in your opinion, the most important soil threats in Romania?”. 40% of the decision makers/planners selected „erosion”. In a similar proportion (40%), the respondents selected „the soil negligent use in agriculture”. 20% of the respondents see „soil contamination” as an important threat and in similar proportions (20% each choice) opted for the „decline in organic matter, depletion of nutrients”, „contamination”, „biodiversity loss” and „salinization”. No respondent decision makers/planners has seen „soil compaction” or „soil sealing” as a major issue. The surprising result came from the inclusion within the listed choices of a „trap choice” referring to an important topic much publicly debated within the last decade in Romania, with regard to the extent the agricultural land should be legally allowed to be sold to the foreign companies or individuals (the national media has raised an estimation, although not data substantiated, of at least 40% of the Romanian agricultural land already owned by EU and non-EU foreigners). The results revealed that among the soil threats, more than one half of the respondent decision makers/planners (60%) selected „allowing land selling to foreigners”. The respondents seem hardly to agree with the impact of the policy of a land open market and moreover, relate a potential decrease of soil quality and associate major soil vulnerability with the implementation of the respective policy.

The representatives of local public administration provided a different picture with regard to the perceived soil threats. A significant proportion (75%) selected „soil contamination”. The other options went to „erosion” (62.5%), „biodiversity loss” (50%), „decline in organic matter, depletion of nutrients”, „soil sealing” and the „soil negligent use in agriculture” (37.5% each choice). Only 12.5% opted for „soil compaction” or „salinization” as important

threats. A significant proportion of the respondents (25%) selected „allowing land selling to foreigners” as a major issue.

The results revealed a similar perception among decision makers/planners as well as the representatives of local public administration when questioned about those who should be the most interested and responsible to the soil quality and fate (only one choice allowed). More than half of the decision makers/planners (60%) answered „the entire society, the public at large, since much of our daily food is grown on soil”. A similar proportion for the respective option was shared by the representatives of the local public administration (62.5%). Lesser shares were recorded for the option „farmers but also the soil experts and soil researchers” (20% of the decision makers/planners and 25% of the representatives of public administration) and „farmers, experts/researchers but also the policy makers that are supposed to propose adequate regulations and strategies for soil protection” (20% of the decision makers/planners and 12.5% of the representatives of public administration). Most of the respondents seem to agree with the fact that soil fate as well as the development of specific measures appropriate for soil protection would be a shared responsibility among many stakeholders. Soil protection seems an important issue for a large joint involvement.

To the question „How do you rate the general public interest on soil issues and soil protection?”, 60% of the respondent decision makers/planners answered „negligible” and 40% answered „absent”. All of the respondent representatives of local public administration (100%) answered „negligible”. 60% of the respondent decision makers/planners consider the current national policies and their enforcement regarding soil protection in Romania as „inconsistent” and 40% as entirely „absent”. Half of the representatives of public administration (50%) perceive the current national policies and their enforcement regarding soil protection as „inconsistent”, 37.5% as „relatively good but the enforcement is low” and 12.5% as entirely „absent”.

When asked to tick one option regarding the best technological approach to secure simultaneously, the soil fertility, the increasing food demands and the environment protection, the vast majority of respondent decision makers/planners (80%) selected the „environmental friendly agriculture (agri-environment measures) including traditional land management practices and natural landscape conservation”. It is to be noted that Romania is ranked 5<sup>th</sup> in EU 27 with 5,221,251 ha of agricultural land having potentially high natural value (MADR, 2017). The rest of 20% of the respondents selected „organic farming” - although organic farming accounts still a minor proportion in Romania (1.67% of the total utilized agricultural area) and slightly tending to decrease (Eurostat, 2018). A significant proportion of the respondent representatives of local public administration (62.5%) opted for „organic farming”, 25% for „environmental friendly agriculture” and 12.5% for „conservative agriculture/minimum tillage” (a significant signal that conservation agriculture has become a sector of growing interest in Romania).

The stakeholders were also asked about the way they may expect an improvement of the acknowledgement of importance of soil sustainability as well as the adoptions of some improved solutions regarding soil

protection (multiple answers allowed). A significant proportion of decision maker/planners (40%) considered as important the issue of a European Soil Directive and in the same extent (40%) opted for need of a soil quality raising public awareness campaign. Most of the respondent representatives of the local public administration selected the option „a governmental program for periodical agro-chemical and soil quality testing of the agricultural land (similar with the one implemented some three-four decades ago). It is to be noted that the respective answer make clear reference to a very consistent governmental program undertaken during the former '70-'80<sup>s</sup> period, empowering and supporting the soil experts from the soil county offices network and the national soil science institute to periodically check the soil quality (in terms of agro-chemical status as well as soil cover quality) of the former agricultural cooperatives land (whose management was supposed to periodically tune the land fertilization plan, according to soil survey findings). Half of the respondent representatives of the local public administration (50%) perceived as important a national law on soil and soil protection and in the same extent (50%) the soil quality raising public awareness campaign (Figure 2).

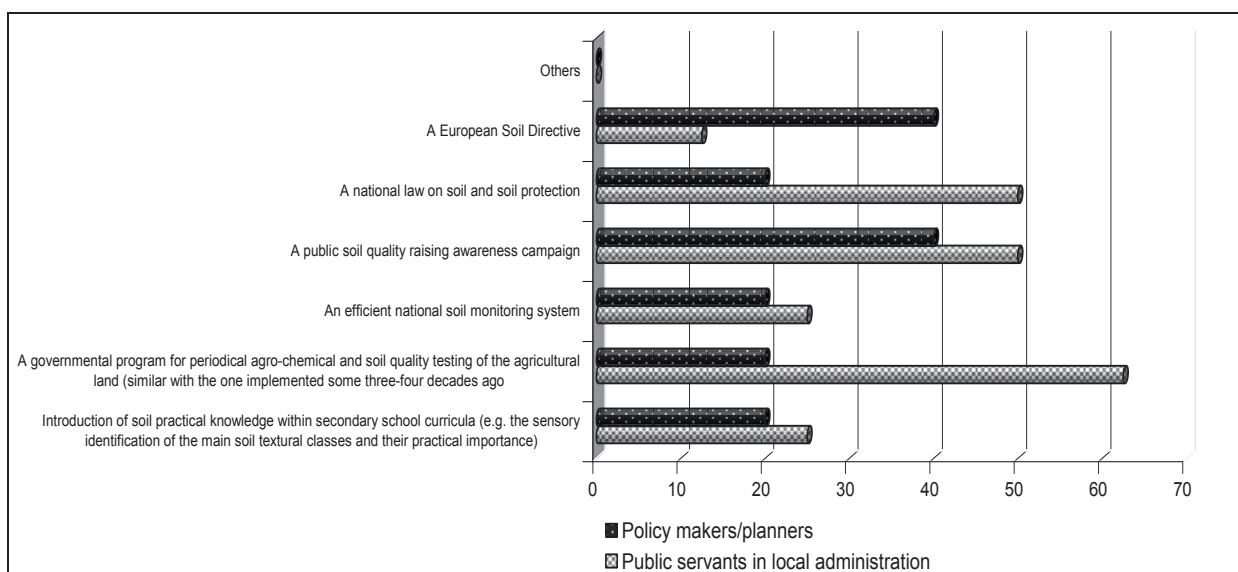


Figure 2. Shares of the stakeholder group's views regarding ways to rise the acknowledgement of the importance of soil sustainability as well as the adoptions of tools and policies towards soil protection (%)

Asked about from where do they get the most reliable information on soil issues or soil quality (with multiple answers allowed), more than half of the respondent decision makers/planners (60%) indicated the open discussions and debates with experts/researchers, the TV agricultural programs (40%) and the internet (40%) whilst the representatives of local public administration opted for open discussions and debates with experts/researchers (62.5%), the newspaper and agricultural reviews (62.5%) and seminars and trainings (50%).

### CONCLUSIONS

The match-making process with regard to the adoption and implementation of the European Strategic Research Agenda on integrated spatial planning, soil management and land use in Romania revealed some good overlaps between the research needs seen as priorities by the national stakeholders and those selected for a tentative co-funding by the Ministry of Agriculture and Rural Development.

The integrated research needs rather than the thematic ones in the European Strategic Research Agenda seem to match better the national funding bodies' expectations.

Regarding the views of the decision makers and representatives of local administration, a significant proportion of the respondents perceived the „allowing land selling to foreigners” as an important soil threat. The majority of respondents considered that the general public interest on soil issues and soil protection is negligible or even entirely absent. A much stronger commitment and shared responsibility among many stakeholders with regard to soil health and soil conservation is expected.

When asked to identify the best fit solutions under a dual necessity for maintaining fair yields and protecting the environment, a significant majority of respondents revealed a clear agreement with the benefits of the agricultural practices under agri-environment measures (including High Natural Value farming and organic farming). The results signal a strong support of the stakeholders for the recent environmental and

agricultural policies (connected with CAP direct payments) implemented in Romania via the National Rural Development Program (MADR, 2017).

Regarding the adoptions of solutions to protect the soil and increase the acknowledgement of soil importance, most of the actual decision makers/planners are committed to the need for a Soil European Directive, but some of the respondent stakeholders seem to long for a past when the former governments imposed a significant higher authority on soil use and make available a better financial support for the national soil survey system.

The results of the survey reveal a significant trust of both decision makers/planners as well as employees of local public administration in research and also a significant appetite for open face-to-face discussion about soil issues with researchers and soil experts.

### ACKNOWLEDGEMENTS

The match-making process and stakeholders' workshop were organized under the EU HORIZON 2020 research project „INSPIRATION-Integrated Spatial Planning, Land Use and Soil Management Research Action”, EC Grant agreement no: 642372, whilst the questionnaire-based survey was carried under the research project „High Natural Value farming soil indicators sensitivity analyses and stakeholders' perception assessment with regard to agro-environment practices, soil protection policies and connected societal challenges”, PN 18.44.0302, funded by the „Nucleu” („Core”) Research Program of the Romanian Ministry of Research and Innovation.

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