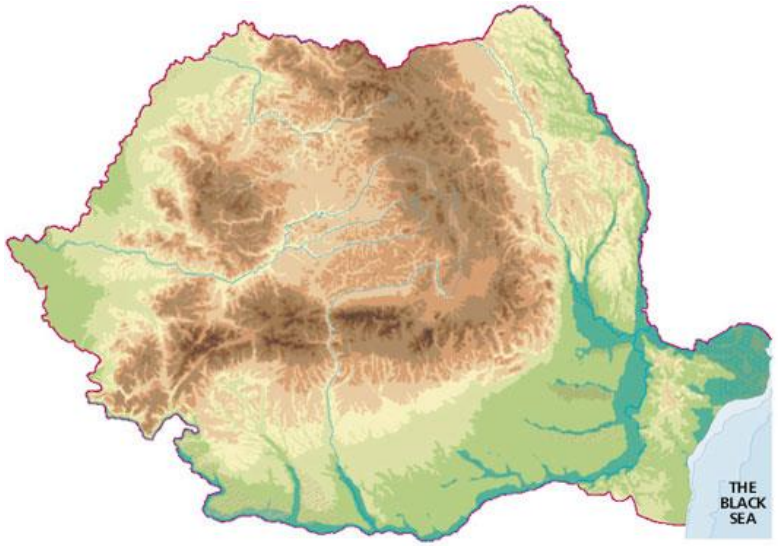
Romania:

Towards an RDI strategy with a strong smart specialization component



Bazat pe prezentarea la conferinta de S3 Peer Learning, Dublin, 2014

Despre UEFISCDI- One Stop Shop !

Acces la resurse electronice

Acces la resurse electronice

National Strategy for RDI 2014-2020
with a strong smart specialization component

STEP 1. **The "Analysis and Evidence Base of the R&D&I Market in Romania" (JASPERS/ARUP 2013)** was launched in March 2013.

STEP 2. In the period January-December 2013 a large foresight exercise was carried out as part of the project **"Elaboration of the National Research, Development and Innovation Strategy 2014-2020"** (www.cdi2020.ro)

STEP3. **Political dialogue**

Project **“Elaboration of the National Research, Development and Innovation Strategy 2014-2020”** (www.cdi2020.ro)

Outsourced by the Ministry of National Education to a consortium of 11 partners and 142 supporting organizations.

Key stakeholders group (60+ persons) validated the results (Vision and priorities)

Panellists and online respondents were identified through ‘knowledge maps’ (social network analyses of the Romanian RDI ecosystem based on data collected from projects, publications, patents); the list was further extended through nomination and co-nomination.

The elaboration of the RDI Vision 2020

Panel of 30 experts and stakeholders
(4 meetings, Jan-March 2014)

World café debate with key actors (70 persons)

RDI Vision 2020

In 2020 Romania is regionally and globally competitive through innovation supported by research and development, thus generating wellbeing and prosperity for its citizens.

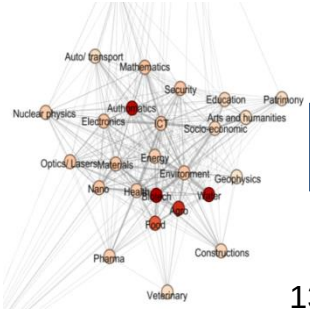
The competitiveness is fed by an innovation ecosystem in which research and development supports the advance along global value chains. In this environment excellence and entrepreneurship mobilize a critical mass of actors.

Vision's 3 pillars:

- Companies become key actors of innovation
- The RDI sector is an arena of opportunity for the talented
- Regional leadership at the frontier of science through breakthroughs in strategic fields

The process for identification of priorities

29 fields



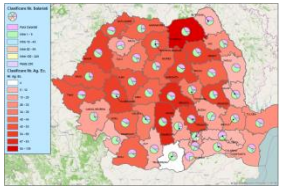
13 fields
for structuring
the debate

Online exploratory
consultation

1500+
proposals

13
panels

Knowledge maps



90
microvisions

Online real-time
Delphi

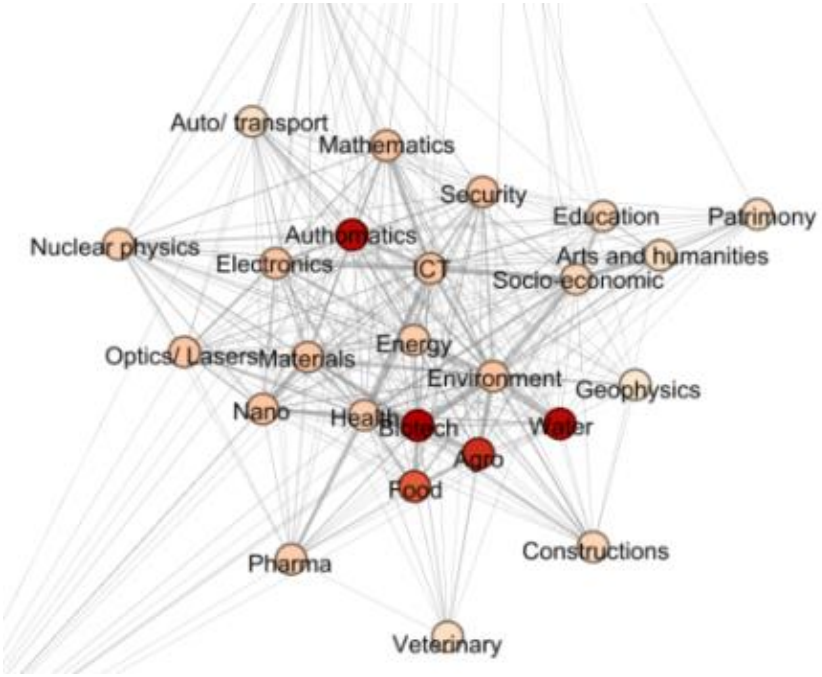
90
microvisions
ranked

Key
stakeholders
meeting

29 fields have been identified by integrating different inputs

- Aeronatutics
- Agro
- Food
- Water
- Arts & humanities
- Auto/ transport
- Automatisation
- Biotech
- Constructions
- Education
- Electronics
- Energy
- Pharma
- Nuclear phys.
- Geophysics
- ICT
- Mathematics
- Materials (new)
- Veterinarian
- Environment
- Nanotech
- Naval
- Optics
- Patrimony
- Health
- Security
- Socio-economic
- Space
- Textiles

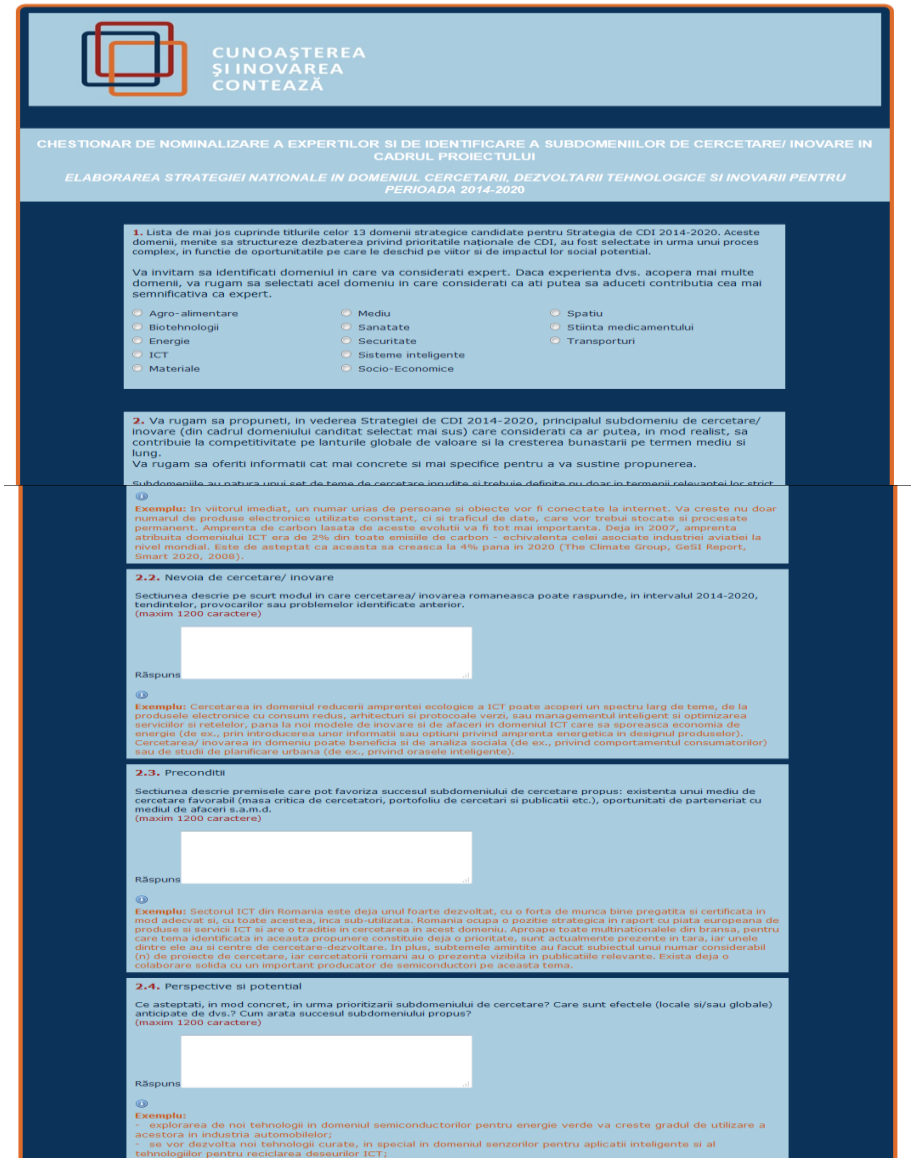
Data analytics proposed clustering



13 fields have been validated in a key stakeholders' meeting for structuring the consultations

- Agro-Food
- ICT
- Intelligent systems
- Health
- Energy
- Pharmaceuticals
- Environment
- Security
- Space
- Materials
- Biotechnologies
- Transport
- Socio-economic

Exploratory online consultation along the 13 fields (June 2013)



CUNOAȘTEREA ȘI INOVAREA CONTEAZĂ

CHESTIONAR DE NOMINALIZARE A EXPERTILOR SI DE IDENTIFICARE A SUBDOMENIILOR DE CERCETARE/ INOVARE IN CADRUL PROIECTULUI

ELABORAREA STRATEGIEI NATIONALE IN DOMENIUL CERCETARII, DEZVOLTARII TEHNOLOGICE SI INOVARII PENTRU PERIOADA 2014-2020

1. Lista de mai jos cuprinde titlurile celor 13 domenii strategice candidate pentru Strategia de CDI 2014-2020. Aceste domenii, menite sa structureze dezbaterea privind prioritatile naționale de CDI, au fost selectate in urma unui proces complex, in functie de oportunitatile pe care le deschid pe viitor si de impactul lor social potential.

Va invitam sa identificati domeniul in care va considerati expert. Daca experienta dvs. acopera mai multe domenii, va rugam sa selectati acel domeniu in care considerati ca ati putea sa aduceti contributia cea mai semnificativa ca expert.

- Agro-alimentare
- Biotehnologii
- Energie
- ICT
- Materiale
- Mediu
- Sanatate
- Securitate
- Sisteme inteligente
- Socio-Economice
- Spatiu
- Stiinta medicamentului
- Transporturi

2. Va rugam sa propuneti, in vederea Strategiei de CDI 2014-2020, principalul subdomeniu de cercetare/ inovare (din cadrul domeniului candidat selectat mai sus) care considerati ca ar putea, in mod realist, sa contribuie la competitivitate pe lanturile globale de valoare si la cresterea bunastarii pe termen mediu si lung.
Va rugam sa oferiti informatii cat mai concrete si mai specifice pentru a va sustine propunerea.

Subdomeniile au natura unui set de teme de cercetare inrudite si trebuie definite nu doar in termenii relevantei lor strict

Exemplu: In viitorul imediat, un numar urias de persoane si obiecte vor fi conectate la internet. Va creste nu doar numarul de produse electronice utilizate constant, ci si traficul de date, care vor trebui stocate si procesate permanent. Amprenta de carbon lasata de aceste evolutii va fi tot mai importanta. Deja in 2007, amprenta atribuita domeniului ICT era de 2% din toate emisiile de carbon - echivalenta celei asociate industriei aviatiei la nivel mondial. Este de asteptat ca aceasta sa creasca la 4% pana in 2020 (The Climate Group, GeSI Report, Smart 2020, 2008).

2.2. Nevoia de cercetare/ inovare

Sectiunea descrie pe scurt modul in care cercetarea/ inovarea romaneasca poate raspunde, in intervalul 2014-2020, tendintelor, provocarilor sau problemelor identificate anterior.
(maxim 1200 caractere)

Răspuns

Exemplu: Cercetarea in domeniul reducerii amprentei ecologice a ICT poate acoperi un spectru larg de teme, de la produsele electronice cu consum redus, arhitecturi si protocoale verzi, sau managementul inteligent si optimizarea serviciilor si retelelor, pana la noi modele de inovare si de afaceri in domeniul ICT care sa sporeasca economia de energie (de ex., prin introducerea unor informatii sau optiuni privind amprenta energetica in designul produselor). Cercetarea/ inovarea in domeniu poate beneficia si de analiza sociala (de ex., privind comportamentul consumatorilor) sau de studii de planificare urbana (de ex., privind orasele inteligente).

2.3. Preconditii

Sectiunea descrie premisele care pot favoriza succesul subdomeniului de cercetare propus: existenta unui mediu de cercetare favorabil (masa critica de cercetatori, portofoliu de cercetari si publicatii etc.), oportunitati de parteneriat cu mediul de afaceri s.a.m.d.
(maxim 1200 caractere)

Răspuns

Exemplu: Sectorul ICT din Romania este deja unul foarte dezvoltat, cu o forta de munca bine pregatita si certificata in mod adecvat si, cu toate acestea, inca sub-utilizata. Romania ocupa o pozitie strategica in raport cu piata europeana de produse si servicii ICT si are o traditie in cercetarea in acest domeniu. Aproape toate multinationalele din bransa, pentru care tema identificata in aceasta propunere constituie deja o prioritate, sunt actualmente prezente in tara, iar unele dintre ele au si centre de cercetare-dezvoltare. In plus, subtemele amintite au facut subiectul unui numar considerabil (n) de proiecte de cercetare, iar cercetatorii romani au o prezenta vizibila in publicatiile relevante. Exista deja o colaborare solida cu un important producator de semiconductori pe aceasta tema.

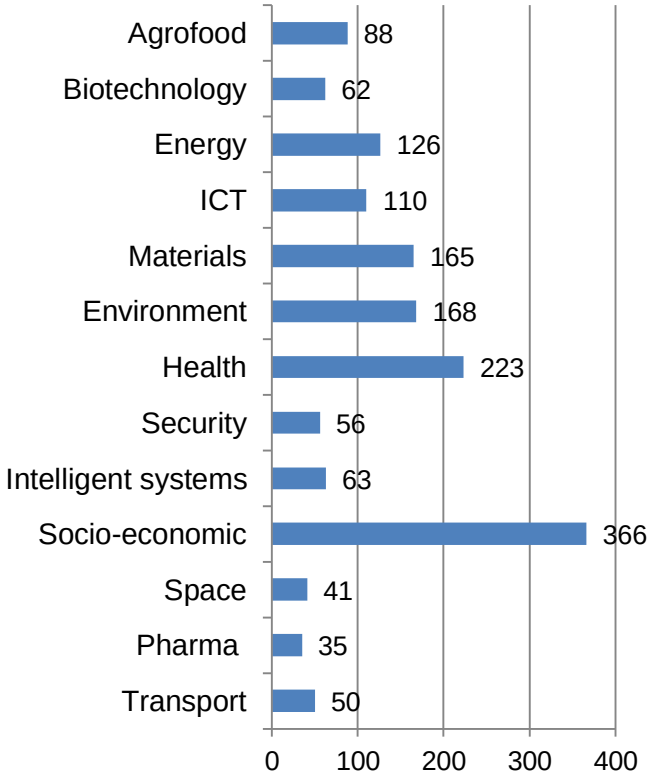
2.4. Perspective si potential

Ce asteptati, in mod concret, in urma prioritizarii subdomeniului de cercetare? Care sunt efectele (locale si/sau globale) anticipate de dvs.? Cum arata succesul subdomeniului propus?
(maxim 1200 caractere)

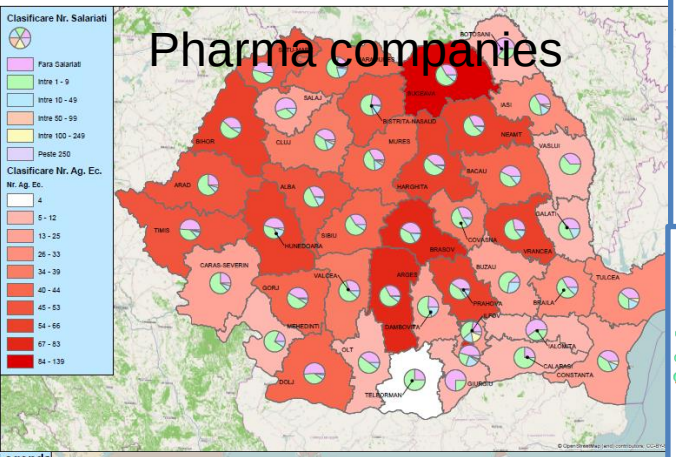
Răspuns

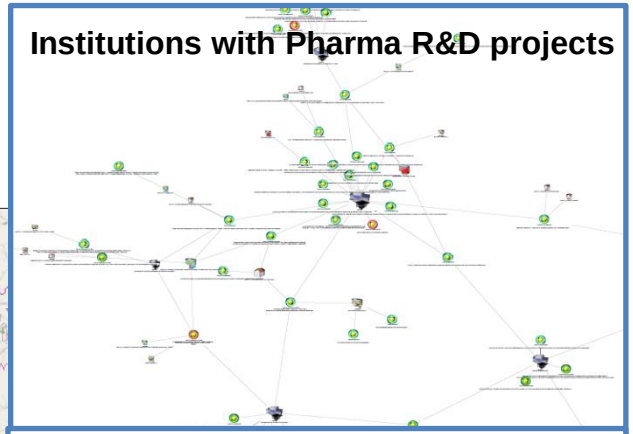
Exemplu:
- explorarea de noi tehnologii in domeniul semiconductorilor pentru energie verde va creste gradul de utilizare a acestora in industria automobilelor;
- se vor dezvolta noi tehnologii curate, in special in domeniul senzorilor pentru aplicatii inteligente si al tehnologiilor pentru reciclarea deseurilor ICT;

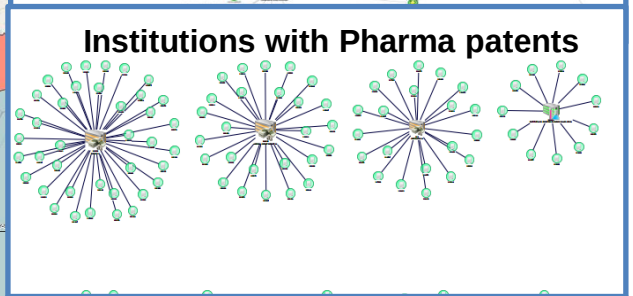
28000+ persons invited
1500+ responses
2000 new persons have been nominated

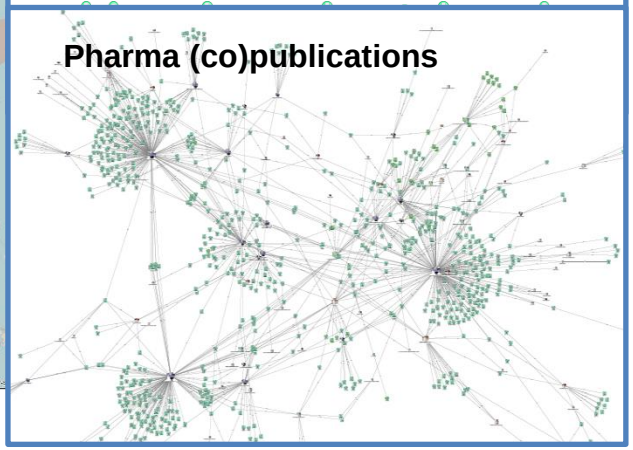


“Knowledge maps” for each of the 13 fields



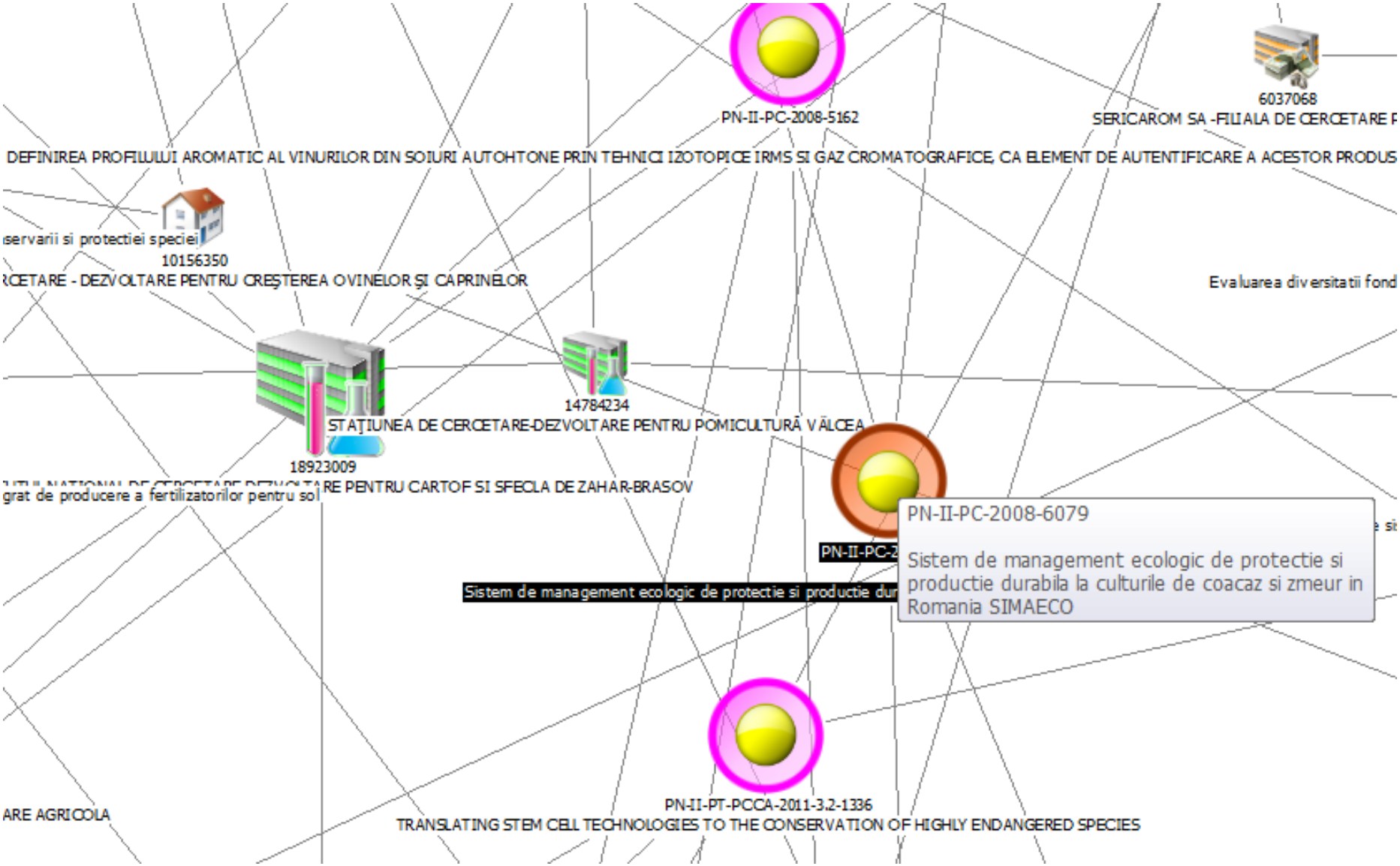




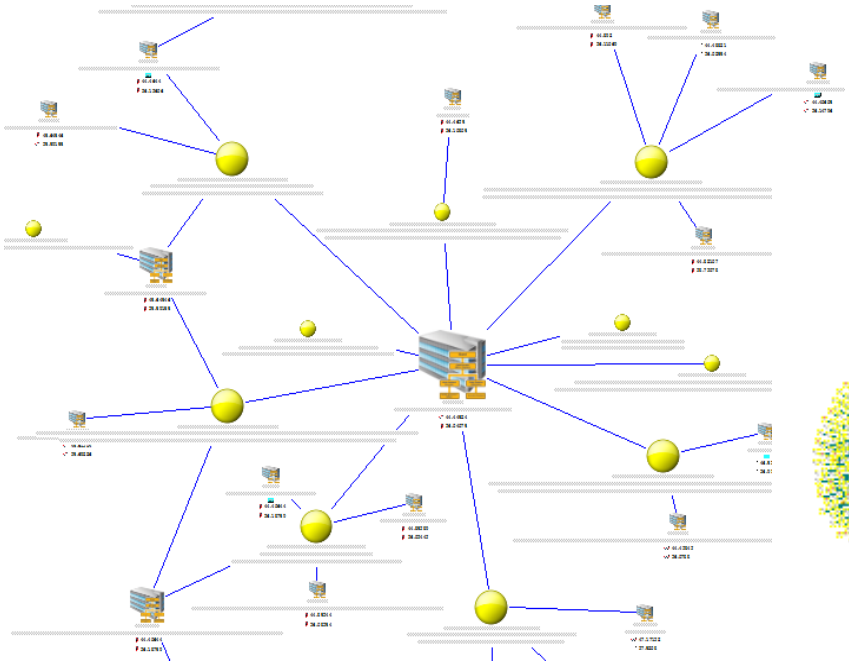


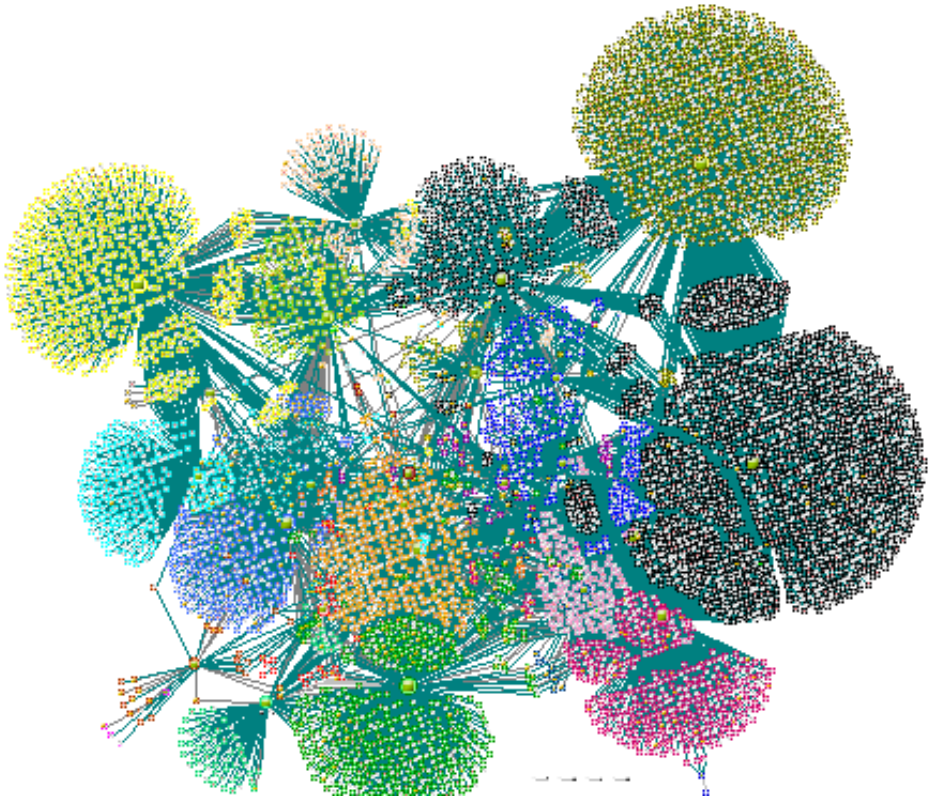
Data analytics of

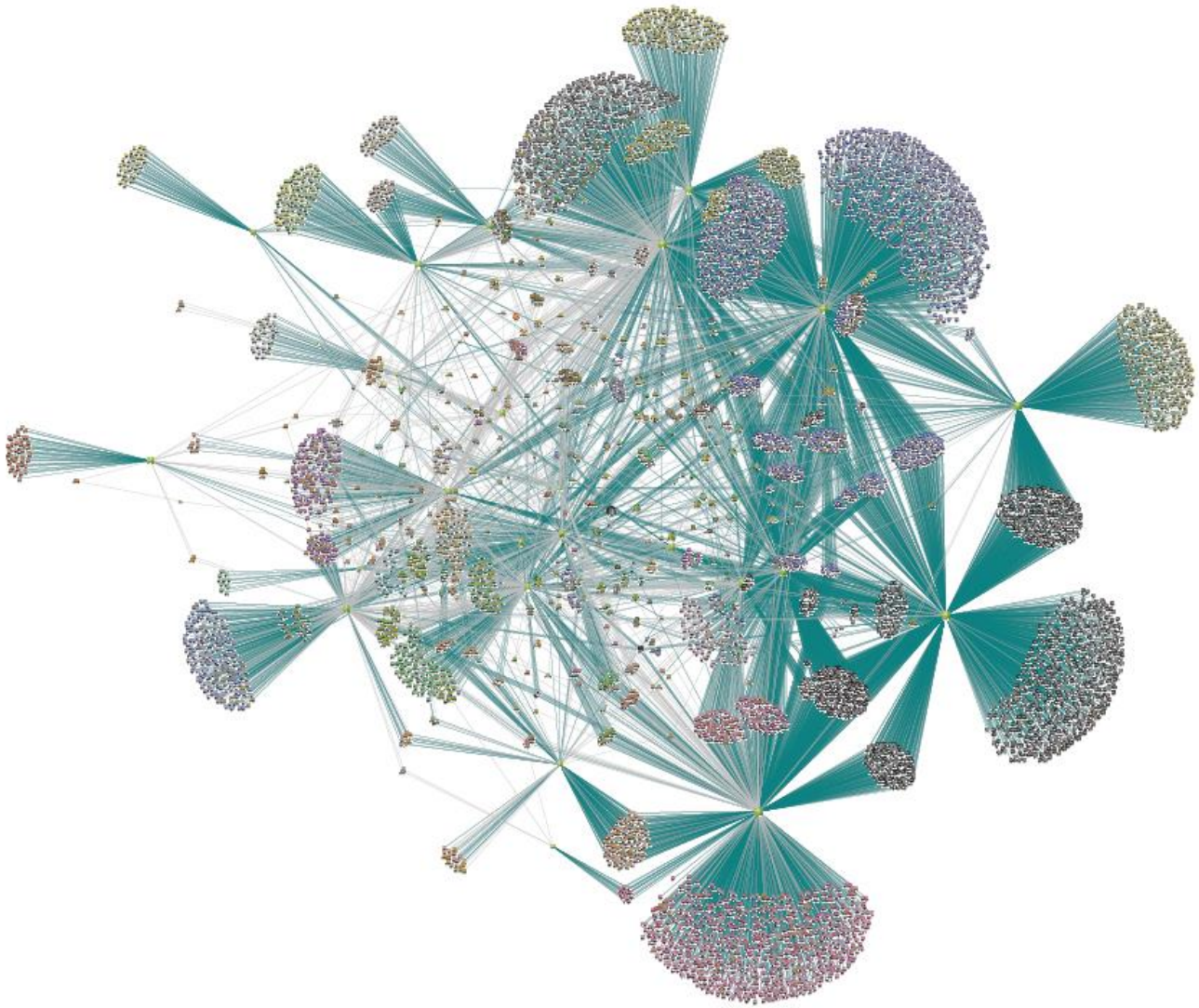
- National RTDI projects (5000+)
- Projects FP7 (600+)
- RTDI Structural funds projects (500+)
- Patents (7000+)
- ISI Thomson articles (100.000+)
- Companies track record (600.000+)
- Top export companies

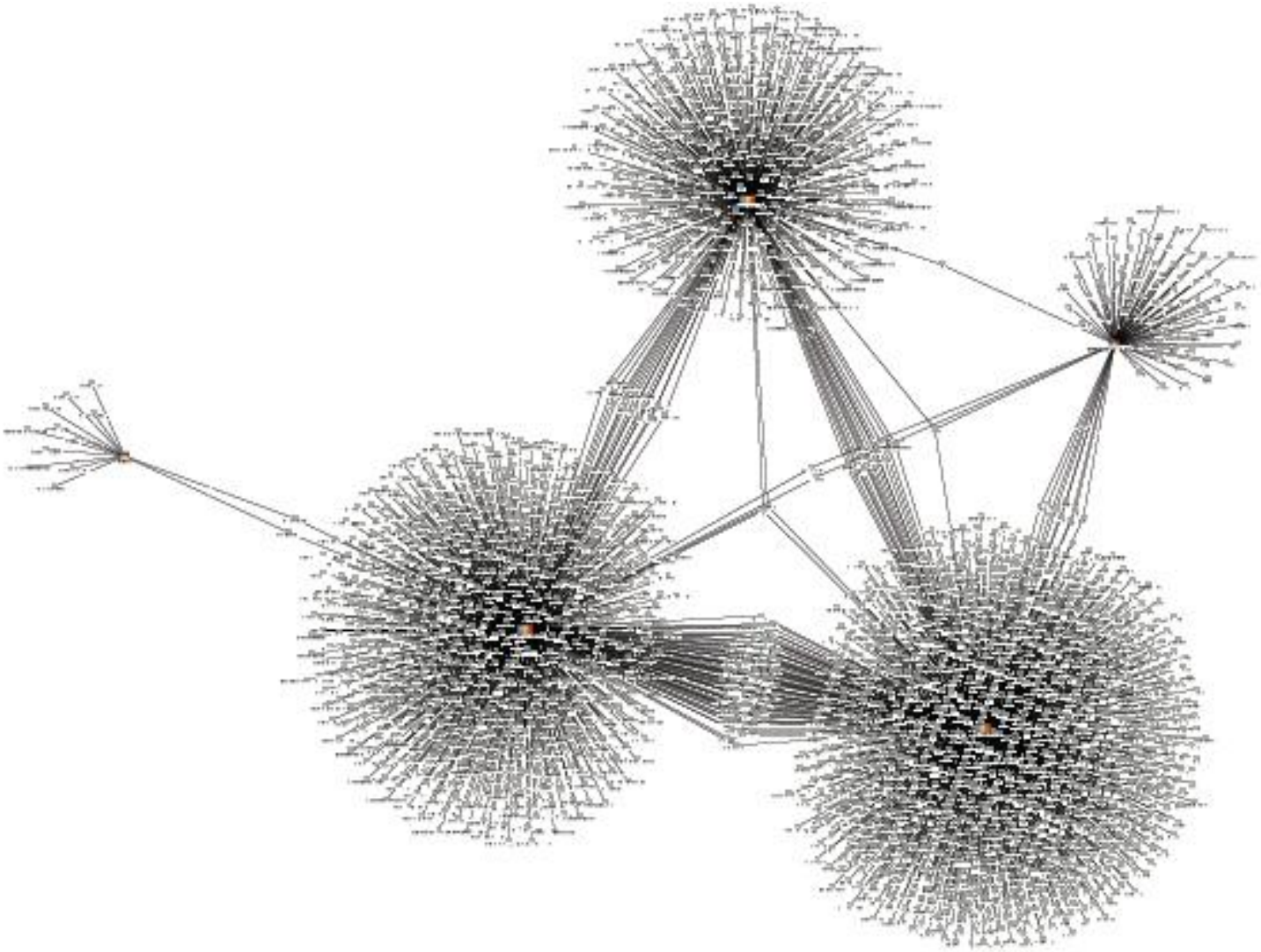

PN-II-PC-2008-5162
6037068
SERICAROM SA -FILIALA DE CERCETARE P
DEFINIREA PROFILULUI AROMATIC AL VINURILOR DIN SOIURI AUTOHTONE PRIN TEHNICI IZOTOPICE IRMS SI GAZ CROMATOGRAFICE, CA ELEMENT DE AUTENTIFICARE A ACESTOR PRODUS
10156350
RCETARE - DEZVOLTARE PENTRU CREŞTEREA OVINELOR ŞI CAPRINELOR
Evaluarea diversitatii fond
14784234
STAŢIUNEA DE CERCETARE-DEZVOLTARE PENTRU POMICULTURĂ VÂLCEA
18923009
RE PENTRU CARTOF SI SFECLA DE ZAHAR-BRASOV
grat de producere a fertilizatorilor pentru sol
PN-II-PC-2008-6079
Sistem de management ecologic de protectie si productie durabila la culturile de coacaz si zmeur in Romania SIMAECO
PN-II-PC-2
Sistem de management ecologic de protectie si productie dur
PN-II-PT-PCCA-2011-3.2-1336
TRANSLATING STEM CELL TECHNOLOGIES TO THE CONSERVATION OF HIGHLY ENDANGERED SPECIES
ARE AGRICOLA

Institutional signatures (R&D projects, publications, patents)

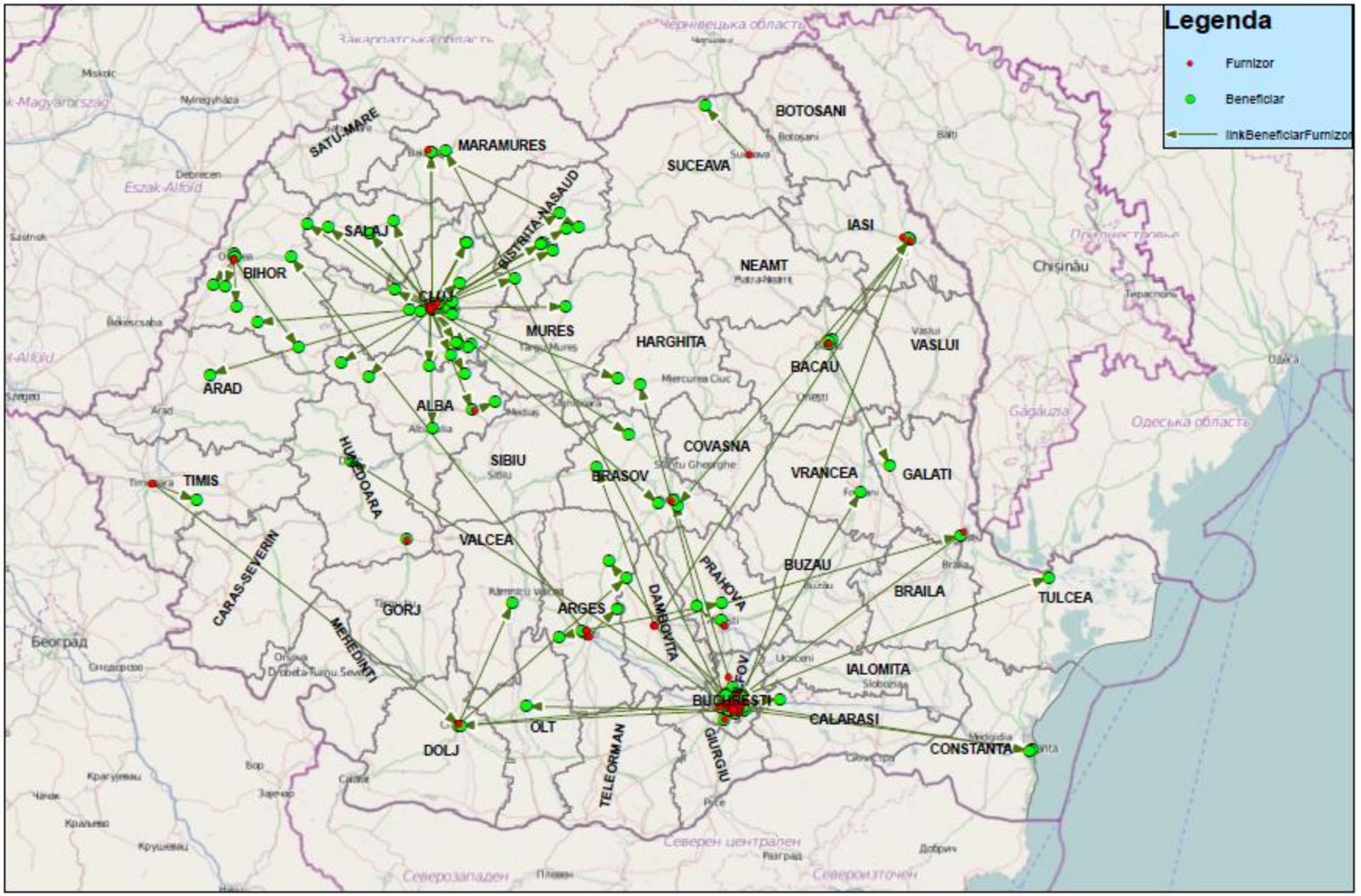








Reprezentarea legaturilor intre beneficiar si furnizor
INCI 2013



The 13 panels

- **Formation**
  - Each coordinated by a triplet **Business –Institute-University**
  - Participants (20 per panel) selected based on a co-nomination process

- **Input**
  - Results of the exploratory questionnaire
  - Knowledge maps
  - A repository of statistics and studies

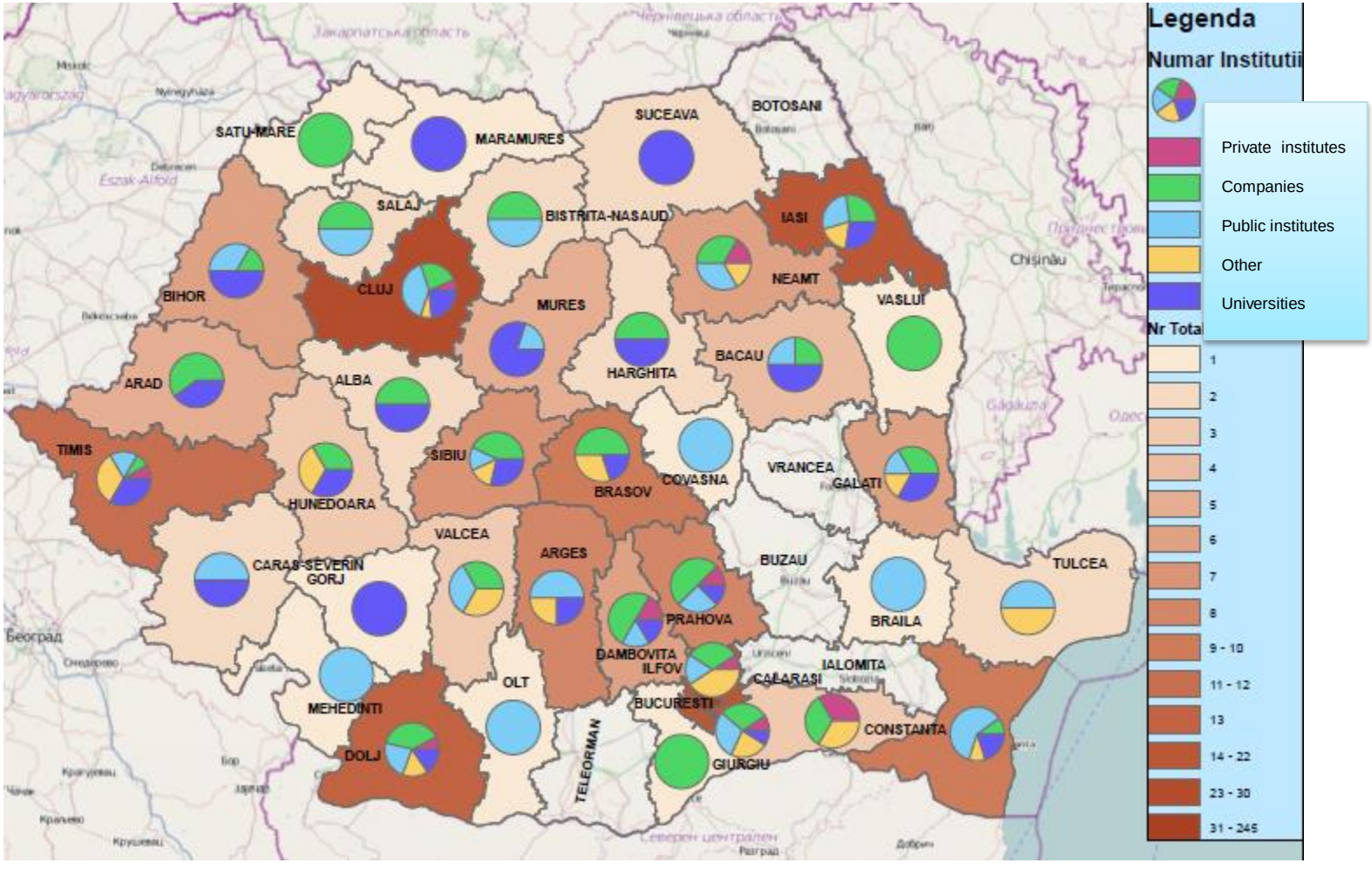
- **Procedure** (4 days face to-face)
  - Foresight oriented (e.g. exploring drivers of change)

- **Output**
  - 6-8 **micro-visions** for subfields, each following a template of arguments
    - 2020 micro-vision statement
    - The opportunity (→ Looking beyond the boundaries)
    - The possible contribution the R&I for benefiting the opportunity (e.g. promising RDI lines)
    - The current RDI capacity at national level
    - Economic relevance
    - Required R&D investments for reaching critical mass

The micro-visions elaborated by the panels entered an online consultation for selection, using an argumentative real-time Delphi
Aug-Sept 2013

Real-time Delphi

- 44.111 persons invited
- 4091 respondents
- Average 161 respondents per micro-vision



•Exploration and discovery

Selection mechanism

Rank	Micro-vision	Required investment for reaching critical mass	
1			
2			
3			
			Σ 5 billion Euro
90			**24 billion Euro**

The fiches has been ranked based on three criteria (each estimated on a 1-5 equivalent scale) :

(1) the opportunity, in terms of the **future dynamics of the field** (**25%** in the composite index);

(2) the possible **contribution the RDI** (**25%** in the composite index).

(3) the estimated **economic impact** (**50%** in the composite index).

Smart specialisations identified in the foresight exercise include:

A1. BIOECONOMY

- Safe, accessible, nutritionally optimized food
- Sustainable development in forestry
- Zootechnics, veterinary medicine, fishing and aquaculture
- New products, practices, processes and technologies in horticulture
- Sustainable development of fields crops
- Bioenergy – biogas, biomass, biofuels
- Biotechnologies for agro-food
- Nanobiotechnology
- Environmental biotechnologies
- Industrial biotechnologies
- Bioanalysis
- Medical and pharmaceutical biotechnologies
- In vitro/ in vivo assessment for generic drugs
- Systemic, local and targeted drug delivery and technologies to optimize the biopharmaceutical and pharmacokinetic profile
- Molecular design, (bio)synthesis, semisynthesis, high-performance screening

A2. ICT

- Analysis, management and security of big data
- Future internet
- Software development technologies, instruments, and methods
- High performance computing and new computational models

A3. ENERGY AND ENVIRONMENT

- Increasing end-use energy efficiency
- Optimizing the use of conventional and non-conventional water resources
- Substitution of critical materials and functional covering
- The intelligent city

A4. ECO-TECHNOLOGIES

- New-generation vehicles and ecological and energy-efficient technologies
- Innovative technologies, equipment and technical systems for the generation of bioresources
- Depolluting and waste reuse technologies

In addition to the four smart specialisations, the foresight exercise identified three national priorities**: Health, Space and Security**, and **Heritage and cultural identity**.

KET-related Priorities

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Measuring the progress

	Last value (year)	Target 2017	Target 2020
Premises			
Public expenditures for research and development, as a share of GDP	0.31 (2011)	0.61	1.0
Number of doctorate graduates (ISCED 6) per 1000 inhabitants, 25-34 y.o.	1.4	1.5	1.5
Number of researchers in the public sector (full-time equivalent)	12409 (2011)	15000	17000
Scientific publications in the top 10% of the most quoted publications worldwide, as % of the total scientific publications in the country	3.8 (2011)	5	7
International scientific co-publications for 1 mil. inhabitants	148	200	300
Venture capital as % of GDP	0.033	0.06	0.09
Spill-over in the private sector			
Research and development spending of the business sector as a share of GDP	0.17 (2011)	0.6	1.0
Number of researchers in the private sector (full-time equivalent)	3518 (2011)	7000	14500
Public-private co-publication for 1 mil. Inhabitants	8.3	12	16
Innovative SMEs cooperating with others (%)	2.93	3.5	6
EPO patent applications / year	40	80	120
USTPO patent applications / year	17	30	60
Community trade mark applications / EUR 1 billion GDP adjusted to the purchasing power parity	2.14	3	4
Economic impact			
Innovative companies with rapid growth	-	50	150
SMEs introducing innovative products and services (%)	13.7 (2011)	16	20
Revenue from licences and patents from abroad as % of GDP	0.13 (2011)	0.15	0.17

Annex – procedure description

Assistance to identifying national priorities as regards the Smart Specialisation

in the next national strategy for research and innovation 2014-2020

- Jaspers Report (http://www.poscce.research.ro/uploads/programare-2014-2020/final-report-12-aprilie.pdf)
- Recommendations report (http://www.poscce.research.ro/uploads/programare-2014-2020/jaspersrecommendations.pdf)
- Knowledge maps (http://www.cdi2020.ro/pachete-de-lucru/panel-prioritati/)

Foresight

- Expert pannels (http://www.cdi2020.ro/wp-content/uploads/2013/09/Componenta-paneluri-prioritati.pdf)
- Methodology (http://www.cdi2020.ro/pachete-de-lucru/panel-prioritati/)
- “Online” questionnaire (http://www.cdi2020.ro/wp-content/uploads/2014/02/Raportul-chestionarului-identificare-expertilor-si-prioritatilor-candidate.pdf)
- Refining (fiches on: Agro-food; Bio-technology; Energy; ICT; Materials; Environment; Health; Security; Intelligent Systems; Socio-economics; Space; Medicine Science; Transport)
- Prioritization and version Dec. 2013.

Public debate

- National R&D institutes
- Romanian Academy
- Private companies
- Changes as for version Apr. 2014.

+

Feedback & political decision

- ….
- Version July 2014