

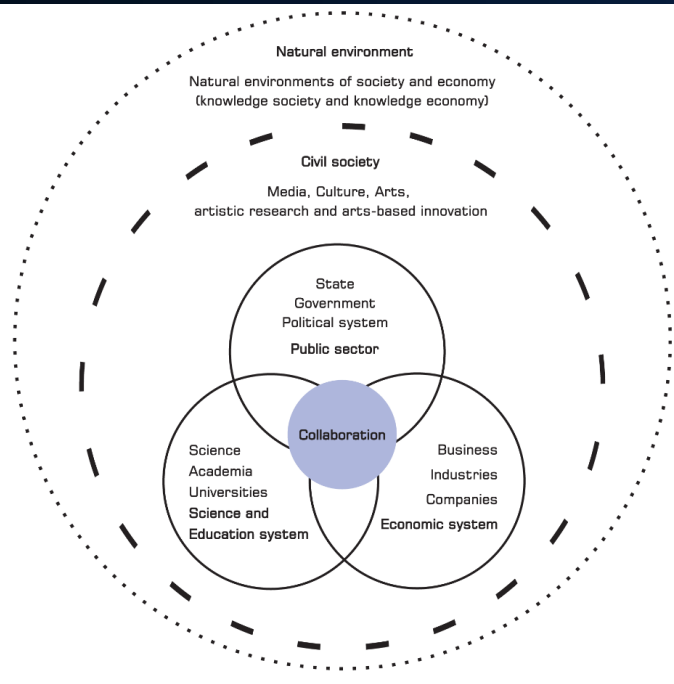


ევროკავშირი
საქართველოსთვის
Project funded by the European Union



Identification and setting of scientific priorities in Georgia

14 November 2022



Dr Inese Gavarane, Resident Twinning Advisor
Shota Rustaveli National Science Foundation

ინტერსექტორული თანამშრომლობის შესაძლებლობების
მხარდაჭერა კვლევასა და ინდუსტრიას შორის

SUPPORTING INTER-SECTORAL COLLABORATION POSSIBILITIES
BETWEEN RESEARCH AND INDUSTRY

This slides were created with the support of the European Union, which does not necessarily mean that it reflects the views of the European Union.
Only project partners are responsible for the content of the publication.

Scientific priorities vs Scientific disciplines

Scientific priorities

- Address research needs from
 - Society
 - Business Sector
- Inform funding programmesCan help to overcome existing silos in the science sector

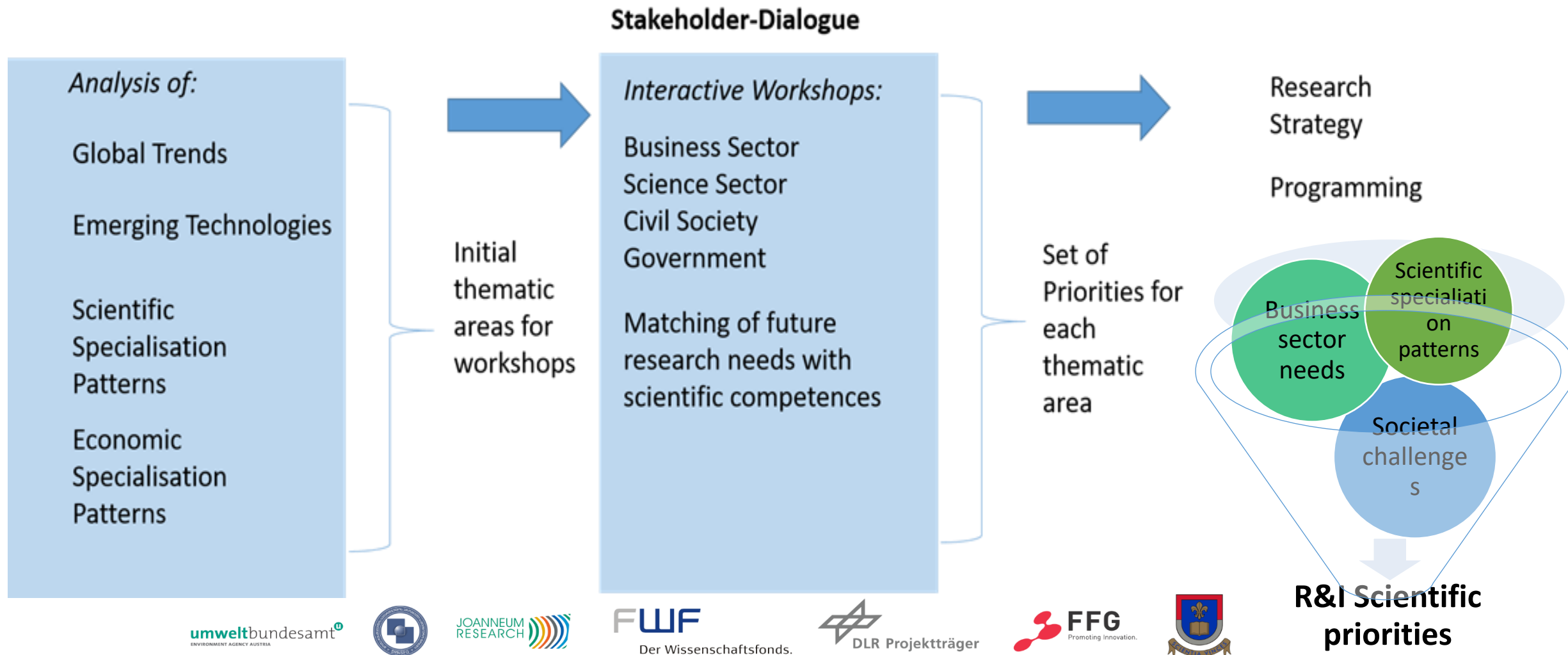
e.g., Quantum research and technology; Smart Cities; Artificial Intelligence; Renewable Energy and climate change; Mobility; Production Technologies

Scientific disciplines

- Have grown as a concept over decades and even centuries
- Reflect mainly organisational structures in academia
- Are a unit of analysis for the assessment of productivity and for benchmarking in science (i.e. bibliometrics)

e.g., Natural Sciences; Medical and Health Sciences; Health biotechnology; Agricultural Sciences; Social Sciences; Humanities

The priority setting process



What are Priorities

Functional Priorities



- refer to **generic challenges** in a national or regional science and innovation system
- address issues such as **technological diffusion**, start-ups, academia-business linkages, **qualification**, IPRs, etc.
- **complement** thematic priorities and may also have a **cross-cutting** character

Thematic Priorities



- address **research needs** from Society and/or the Business Sector
- aim at **fostering collaborative actions** of industry and the science sector
- Examples:

Funding of Science

	Funding by Thematic Priorities	Funding by Science Fields (Disciplines)
Advantages	<ul style="list-style-type: none"> • Very good ability to adopt to emerging trends • Strong potential to adress challenges from society and / or the business sector • Strong potential to promote private sector investments in R&D 	<ul style="list-style-type: none"> • (Relatively) stable framework • No inital consultative effort needed
Disadvantages	<ul style="list-style-type: none"> • Big initial effort needed to identify relevant priorities • Need of periodic adjustments (every 7 to 10 years) 	<ul style="list-style-type: none"> • No involvement of the business sector • No possibility to fund interdisciplinary projects • No possibility to address societal needs properly • Difficulty to adopt to emerging trends

Initial Priority Domains

Criteria

- **Strong national science base** (i.e. specialisation patterns based on bibliometrics and / or patenting)
- **High national economic relevance** (i.e. high share in employment, high expert shares, strong economic growth, cluster development)
- **Global challenges** and / or **priorities** (e.g. climate change)

Priority Domains

- Information and Communication Technology (ICT)
- Arts and Humanities/Cultural Heritage
- Innovative Medicine
- Food and Agriculture
- Renewable Energy
- Circular Economy

Synthesising Overview

Thematic / Functional Priorities	Information and Communication Technology	Arts & Humanities /Cultural Heritage	Food and Agriculture	Renewable Energy	Smart Health	Circular Economy
Development of a national knowledge base	●	●	●	●	●	●
Development / Provision of Research Infrastructures	●			●	●	●
Provision of shared labs and testing /prototyping facilities		●			●	
Regulations and laws			●		●	●
IPR		●				
Adoption / Development of Standards	●				●	
Commercialisation / Internationalisation	●	●	●		●	
Creation of public awareness				●		●
Creation of awareness among business	●				●	●
Development of national sector / technology strategy	●			●		



Initial Priority Domains and Subfields

Priority Domain

Subfields

ICT

- IT Services and interoperability
- Cybersecurity
- Artificial Intelligence

Arts and Humanities/Cultural Heritage

- No subfields

Innovative Medicine

- Research to support the development of Innovative Health Systems
- Bacteriophages
- Herbal Medicine

Initial Priority Domains and Subfields

Priority Domain	Subfields
Food and Agriculture	<ul style="list-style-type: none">• Research to support Food Quality and Safety• Future Farming and Agricultural Technologies
Renewable Energy	<ul style="list-style-type: none">• Research to support the development of Circular Economy• Green Hydrogen• Solar Energy
Circular Economy	<ul style="list-style-type: none">• Research to support the development of Circular Economy• Circular Economy for Construction and Demolition Waste

ICT: Functional Priorities

Priority Subfield

Functional Priorities

IT Services and interoperability

- Development of a national technological knowledge base:
 - Education and Training of IT Specialists
 - Upgrade of existing trainings at universities
- Creation of awareness of IT issues (e.g. Cybersecurity) among companies
- Positioning of Georgia as a location with competitive advantage for outsourcing by international companies (i.e. Low wage rates/labor costs)

Cybersecurity



- Development of a national technological knowledge base:
 - Education and Training of Cybersecurity Specialists
 - Programming skills and advanced knowledge in mathematics (Students, with soldiers)
- Integration of cybersecurity policies into standards and guidelines
- Creation of awareness on cybersecurity among companies and promotion of effective training and cyber exercises
- Fostering of cooperation and networking activities for sharing the experience in Cybersecurity (e.g. with Ukraine and Lithuania)

Artificial Intelligence

- Strengthening partnerships between the universities and private organizations for AI teaching, research and application
- Certification of AI skills and training related to Natural Language Processing
- Development of a national AI strategy
- Provision of laboratory capacities for AI

ICT: Thematic Priorities



Priority Subfield

Themes

IT Services and interoperability

- Virtual museum: 3D models of artifacts, reconstruction. Multimedia and VR technologies in the visualization of artifacts. Virtual reconstruction of historical environment and built reality (Augmented Reality).
- Complex environmental monitoring systems in the maintenance and protection of cultural heritage monuments
- IOT (Internet of things): climate and environment based on technology-based monitoring systems; online data collection, automatic processing (Big data, facial recognition methods), and decision-making algorithms.

Integration of cybersecurity policies into standards and guidelines

- Security by design

Cybersecurity

- Programs minimizing the risk of economic damage due to malfunctions or manipulation of sensitive data
- Security by design
- Software solutions for critical infrastructures

Artificial Intelligence

- Natural Language Processing
- Ethics related to the use of AI





Arts and Humanities/Cultural Heritage: Functional Priorities



- Legislative support: Protection of Copyright and other IPR
- Human resources: promotion of academic training; education at school
- Provision of creative (multifunctional) spaces including technological infrastructure for prototyping (e.g. furniture)
- Provision of a supporting framework for the internationalization of cultural products; supporting activities to anchor young artists internationally
- Branding and story telling in relation for cultural heritage and products in the creative sector
- Provision of managerial skills in relation to cultural heritage and cultural products with a stronger emphasis on economics

Arts and Humanities/Cultural Heritage: Thematic Priorities



- New research methodologies in cultural heritage (including IT)
- Economic Studies on indirect benefits and / or the value of cultural heritage (monetarization)
- Statistical data on culture, and economics of culture; Survey of creative industry/cultural heritage;
- Digital instruments related to Georgian language (e.g., spell checker)
- Mapping of potential cultural heritage layers (GIS)
- Digitisation: Digital Storage and preservation; combining needs of cultural heritage and new digital methods (which digital tools, devices can support different cultural heritage)
- Interdisciplinary projects combining science/technology with Arts & Humanities; Merge science and practitioners

Smart Health: Functional Priorities



Priority Subfield	Functional Priorities
Research to support the development of Innovative Health Systems	<ul style="list-style-type: none"> • Adoption of EU regulatory frameworks; e.g. EC Directive 10/63 (on the protection of animals used for scientific purposes), Regulation on biomedicine • Ensuring Quality of research: Evaluation criteria need to be harmonized (i.e., GE and International); quality / standards need to come to common terms in order to access international programmes • Development of a national knowledge base: long term development of capacities for education and training of young scientists • Funding of research infrastructure (i.e. laboratories and equipment) • Provision of shared laboratory spaces for companies • Make existing research capacities visible for business
Bacteriophages	<ul style="list-style-type: none"> • Industrial production of phages requires a clearer legal framework and clear and transparent research • Development of a national knowledge base: long term development of capacities for education and training of young scientists • International standards – manufacturing practice is missing • Public support on the commercialisation of research results
Herbal Medicine	<ul style="list-style-type: none"> • Establishing a regulatory framework to be able to access international markets; i.e. quality issues • Funding of research infrastructure (i.e. laboratories and equipment) • Promotion of new infrastructural investments for Herbal Medicine • Public support in the promotion of herbal medicine on local and international markets

Smart Health: Thematic Priorities



Priority Subfield

Research to support the development of Innovative Health Systems

Bacteriophages

Herbal Medicine

Themes

- Creation of new types of analgesic drugs
- Selection of specific phages for personalized treatment
- Safety of herbal medicines and reliability of their use, their complexity to eliminate diseases
- Studies about effectiveness of specific herbal medicines
- Mapping of space for cultivation and potential production capacities

Food & Agriculture: Functional Priorities

Priority Subfield

Research to support Food Quality and Safety



Functional Priorities

- Provision of safe and reliable testing and diagnostic laboratories operating across the country
- Filling the gap on Legal and political regulations / to fulfill the European requirements on regulations (accreditation requirements)
- Capacity development for entering the European market in Agriculture, Food Industry, Science and Government
 - knowledge on relevant regulations
 - national framework to meet regulations
- Development of a national knowledge base for Food safety and quality
 - Training and education of researchers
 - Training of companies
- Introduction of a PHD program for food safety in Georgia
- Commercialization of new technologies – GITA programs are not focused on introduction of new technologies
- Training and education for young(er) farmers on new technologies
- Promotion and demonstration of the benefits of new technologies (e.g. IT, irrigation systems, etc.) for farmers
- Provision of a national framework and programme for the testing of probiotics

Future Farming and Agricultural Technologies

Food and Agriculture: Thematic Priorities



Priority Subfield

Research to support Food Quality and Safety



Themes

- Overall risk assessment and analysis for emerging risks in food safety and quality
- Digitalization of agriculture system, monitoring and analysis of big data to identify challenges
- Building up monitoring programs (Residues, and research laboratories (for example: ICP -MS, LC-MS/MS, GC-MS/MS....), and also in high resolution screening equipment's in research institutions (for example TSU) like HRMR, ICP_MS
- Biorefineries and Biofuels
- Integrating artificial intelligence in agribusiness
- Impact of climate change on soil and local climate
- Reuse and treatment of waste in food production
- Probiotics from plant materials

Future Farming and Agricultural Technologies

Renewable Energy: Functional Priorities



Priority Subfield

Research to support the development of Renewable Energy / Research Capacities and Infrastructure

Green Hydrogen



Solar Energy

Functional Priorities

- Capabilities and training: Need for courses for renewable energies, in-depth training both for researchers and professionals
- Research infrastructures and Demonstrators for Renewables (e.g. solar, wind)
- Creation of public awareness to the benefits of renewable energy
- Development of a national hydrogen strategy in lines of the EU strategy to align private and public views, and to ensure coherence with the other domains of energy policy
- Development of a roadmap for green hydrogen in Georgia involving science, industry and government
- Public awareness raising on hydrogen and the use of this new technologies
- Provision of a clear legal framework for investors
- Capabilities and training: Need for courses for solar energy, in-depth training both for researchers and professionals

Renewable Energy: Thematic Priorities



Priority Subfield

Research to support the development of Renewable Energy / Research Capacities and Infrastructure



Green Hydrogen

Solar Energy

Themes

- Weather forecasts with high Geo resolution
- Data on (local) energy demand and supply; Data on resources and potentials for renewables with high Geo resolution
- Impact of climate change on the potential future yield of water power plants
- Smart Grids and Micro grids
- Assessment of the impact of developing the new technology on the labor market and the wider economy
- Analysis of potential roles of ammonia in a green hydrogen world
- Data on resources and potentials for solar energy with high Geo resolution
- Security by design
- Impact of climate change on the potential future yield of solar energy power plants

Circular Economy: Functional Priorities



Priority Subfield

Functional Priorities

Research to support the development of Circular Economy

- Development of research infrastructures
- Development of academic training courses on circular economy
- Development of a national monitoring and information system on waste streams

Circular Economy for Construction and Demolition Waste

- Development of research infrastructures
- Awareness raising and capacity building among companies
- Align to the European Legislation and best practice in the field
- Implementation of Extended Producer Responsibility (EPR)



Circular Economy: Thematic Priorities



Priority Subfield

Research to support the development of Circular Economy

Circular Economy for Construction and Demolition Waste

Themes

- Mapping of Circularity for different products in Georgia's Economy
- Recycling of food waste
- Research survey about waste management and demolition waste





ევროკავშირი
საქართველოსთვის
Project funded by the European Union



[EU Twinning in Science-Business links](#)

მადლობა ყურადღებისთვის
Thank You!



science KNOW

umweltbundesamt
ENVIRONMENT AGENCY AUSTRIA



JOANNEUM
RESEARCH

FWF

Der Wissenschaftsfonds.



DLR Projektträger



FFG
Promoting Innovation.



business GROW