Supporting inter-sectoral collaboration possibilities between
Research and Industry
GE 18 ENI OT 02 19

MEETING REPORT

Identification and setting of scientific priorities important for science and business collaboration in Georgia

Virtual workshops

Component 1 Science - business links strengthened through supportive collaborative activities and funding schemes
Activity 1.2.1. Identification and setting of scientific priorities

Contents

ICT (12.04.2022)

IT Services and interoperability (identification of needs)

What are currently the biggest challenges in the ICT sector?

- Infrastructure;
- Qualification;
- Good engineers, other stuff is very expensive;
- Education level of IT specialists, lack of personnel;
- Need for upgrade of training at universities;
- Low level of awareness of IT issues (e.g. cybersecurity);
- Level of knowledge related to EC priorities lacking;
- No hardware development; Hardware production in the 80ies. Microelectronics, hardware Systems;
- Home grown software – lack of service;
- A small amount of IT software available for companies (CRM's etc.)

What are currently the biggest opportunities in the ICT sector?

- Digital innovation hubs;
- Datacenters located nearer to Asia;
- Competitive advantage for outsourcing by international companies;

Low wage rates/labor costs.

Cybersecurity

What are currently the biggest challenges in the Cybersecurity?

- Although cybersecurity professionals are essential in today's marketplace, they need training and education as well;
- Lack of personal and professional skills;
- Lack of knowledge about protecting personal data, surfing save (there are some training programs);
- Dangerous email providers in public sectors in SMEs-scare resources;
- Computer literacy issues – Russian origin licking data to Russian services;
- Cyber-attack for the governmental sector – very complicated to solve/needs a political decision and see the whole picture;
- Procurement process in Georgia – lack of flexibility to not to use this software;
- Safe use of social media, fake news, personal data, and influencing young people, become great challenges in the next two years;
- Protecting ICT systems from unauthorized access or manipulation;
- Effective training and cyber exercises;
- Introduction and optimization of operational IT security management systems;
- Support for companies (SMEs) for using safe and origin software;
- Measures for risk and security analyses;
- Protecting IT systems from unauthorized access or manipulation;
- Programs minimizing the risk of economic damage due to malfunctions or manipulation of sensitive data;
- Protect users against spam, phishing, malware, viruses, and other cyber threats by developing new methods for combining them;

- Reacting quickly and competently to IT security incidents (e.g., cyber-attacks) and reducing IT security incidents in the company;
- Measures to increase the security awareness of employees;
- Integrate cybersecurity policies into standards and guidelines.

What are currently the biggest opportunities in the Cybersecurity?

- PPP Model – lack of cybersecurity professionals in the public sector;
- Cybersecurity strategy – the first one focuses on cybercrimes;

What research would be needed to meet the identified opportunities?

- Personal data protection;
- Budapest cooperation of cybercrime – international cooperation on the level of legacy;
- Programming skills and advanced math knowledge (Students, with soldiers) – CS Labour Markets. Reform education;
- National Cybersecurity Strategy for 2021-2024 will try to solve these problems through effective training and cyber exercises;
- Division of specific IT skills, proactive security, and software knowledge;
- Cooperation and networking activities for sharing the experience (for example: with Ukraine, Pennsylvania, and Lithuania. MISP: Malware information sharing platform – sharing information/pieces of knowledge – a web platform.

Artificial Intelligence

What are currently the biggest challenges in the AI sector?

- Missing motivation of researchers
- Missing labs for AI;
- Missing supporting innovation ecosystem for AI
- Braindrain – qualified persons are hired by international companies and go abroad
- No or poor absorption capacities for R&D results in companies (no R&D managers)
- Missing incentives for companies to invest into R&D
- Lack of skilled personnel

What are currently the biggest opportunities in the AI sector?

- Brain circulation – bringing experts back to Georgia
- Small but agile and vibrant AI related business community mainly in the area of chat bots and other Natural Language Processing applications
- Positioning as international partner for outsourcing of AI application development

What research would be needed to meet the identified opportunities?

- Research and training related to Natural Language Processing
- AI Strategy to be developed by Ministry of Economy
- Creating safe and trustworthy bilateral data transfer mechanisms with foreign countries
- Strengthening partnerships between the universities and private organizations for AI teaching, research and application
- Certification of AI skills

Creative Industries and Cultural Heritage (28.04.2022)

Research to support the development of Creative Industries and Cultural Heritage – Identification of potential Research Priorities

What are currently the biggest challenges in the Creative Industries and Cultural Heritage?

- Human Recourses - lack of students;
- Notion of Cultural Heritage in economic development (goals and definition of Cultural Heritage;
- Poor cultural managerial skills with the economic prioritization;
- Lack of clear definitions and data and knowledge on Creative Industries & Cultural Heritage – do we talk about the same thing?
- General basis is missing!
- The challenge is how we perceive Cultural Heritage. What is it at all?
- Education at school;
- Interpretation and application of scientific content for the sustainable development of Creative Industries & Cultural Heritage;
- Preservation of rare editions;
- Lack of Legislative Support;
- Copyright;
- Technological development in digitalization;
- The main problem that researchers faced is the financing the pure scientific projects that have no profit as it could be in the case of popular or public projects;
- Technological Infrastructure;
- Digital Storage and preservation;
- OCR systems is lacking;
- Digital library system;
- Business development;
- Authencity.

What are currently the biggest needs in the Creative Industries & Cultural Heritage sector?

- IP Problematic by digitalization of the National Library;
- Conversation of historical building and make them functional again is the very critical – they should be seen in bigger context;
- Relevant technological equipment in general terms and appropriate legal framework;
- Printed interpretation -3DPrinter, modern, progressing technology equipment;
- Sold the “soil” of local houses, historical buildings – we need new strategies to use them otherwise;
- Who owns IP rights;
- Digital transition;
- New research, methodologies in cultural heritage (including IT);
- We need some differences in the scene;
- Digitalization process in Cultural Heritage;

- Conversation and development of the historical building, respecting environment/surrounding context;
- How we proceed in the future?
- Knowledge about the use of digitalization;
- Process of loose cultural heritages, by solving the historical "city center";
- Digitalization data problematic – "larger data bank" – learning computers is a very necessary "needs" in every part of cultural heritage;
- New acknowledges, new skills – in term software, data collection.
- Business location, hotels, restaurants need some aspect of cultural heritage;
- Cultural Heritage is "trendy in the business sector;
- Internationalization our cultural products, services, research is a big opportunity;
- "Popularization" of Cultural Heritage;
- Make culture international;
- Bring our projects "out of the country";
- Give historical building new conventional/truistical etc. function.

What are currently the biggest opportunities in the Creative Industries & Cultural Heritage?

- Cultural sites to be made functional (e.g., restaurants etc.);
- Conversation of the historical buildings – further development;
- Anthropological research to see emic perspective;
- Software digital instruments related to Georgian language – opportunities for business (e.g., spell checker);
- To widen the perception of applied research – i.e. Projects beyond dictionaries;
- Interpretation and storytelling related to cultural heritage;
- Statistical data on culture, and economics of culture;
- Survey of creative industry/cultural heritage;
- New research areas combining needs of cultural heritage and new digital methods (which digital tools, devices can support different cultural heritage);
- Interdisciplinarity – different dimensions of research fieldს need to be combined;
- Merge science and practitioners / interdisciplinarity;
- Economic Studies on indirect benefits (monetarization);
- Study on the value of the cultural heritage;
- Soviet heritage - big issue / problem – how to address this;
- Mapping of potential cultural heritage layers (GIS);
- Supporting activities to make the results of Georgian culture more and more internationally known (incentive for business growth, tourism, research exchanges);
- Supporting activities to anchoring young artists internationally.

Innovative Health Systems (05.05.2022)

Research to support the development of Innovative Health Systems

What are currently the biggest challenges in the Innovative Health Systems sector?

- EC Directive 10/63;
- Regulations (like in EU on Biomedicine;
- Animals Testing Directive (not introduced in Georgia);
- Acts necessary for successful applications for international grants;
- Ministry of Education and Science & Ministry of Health;
- Need for involvement of Ministries – make them more active;
- ***Main pillars of biomedical research:***
- Capacity for applied research;
- Quality of academic training – solution: long term capacity building with international funding;
- Infrastructure – no local funding;
- Bigger framework for research in biomedical research is lacking;
- Assignment of existing capacities;
- Institutional capacity needed to be visible for business.
- ***Business in Georgia not interested in science – lack of capacities:***
- Reaching out to international partners;
- Lab equipment and material bought from distributors;
- Reach out to business;
- Research is brought in abroad;
- Quality of research is main issue – need to regulated;
- Global / wide priorities (e.g. antibiotics);
- Research fellowships;
- Only curiosity driven research:
- Standards for publications;
- Priorities in research fields – annual programs need to come to common terms;
- Priorities in research fields – annual programs need to be coordinated;
- Publications – which ones to aim for?
- Level of accreditation of scientific programmes;
- Evaluation criteria – harmonization needed (i.e., GE and International);
- Quality / standards needed to come to common terms;
- Policy issue for biomedical research.

Bacteriophages

What are currently the biggest challenges in the Bacteriophages?

- Eliava Institute – not associated by HEI's;
- Commercialization is a challenge;
- For new patients there is a need to find active phages must first be cultivated from the patient and tested against various phages;
- Problems regarding financial, missing funds;

- Industrial production of phages requires a clearer legal framework and clear and transparent research;
- International standards – manufacturing practice is missing;
- Challenging to find skilled personnel, e.g. because of low public payment;
- No IP protection for natural products possible;
- Big challenges regarding skilling young people;
- A problem of acceptance / unfamiliarity of phages by the medical community;
- Lack of clinical studies, tests, infrastructures;
- Phages no official, practical packages for patients.

What currently the biggest opportunities in the Bacteriophages?

- Significant opportunities against antibiotics resistance;
- New infrastructural investments for Herbal Medicine;
- R&D become more popular in several European countries (Belgium – advanced) France, Austria, Germany - but not on legal base);
- New infrastructural investments for Herbal Medicine;
- Select specific phages for personalized treatment;
- Ready for use phages - is ready for selling for the population;
- ***FDI:***
- Active in the grant competition/EU funds;
- International interest for the phages (from the Netherlands);
- International contracts with Belgium (with a small services);
- Well organized clinical trials, tests;
- Huge interest from western European market – also USA market – if this can be solved;
- Getting Herbal Medicine on the local and European market PR activities.

Herbal Medicine

What are currently the biggest challenges in the Herbal Medicine?

- Sourse of the herbal plants have to be defined – the way you get them in to useful products need to be defined;
- Collect all the industrial areas, where these products could be used;
- We need clear instruction in which product / industrial branches these herbal medicines (materials) can be used;
- Space for cultivation/ access not possible as much as in the past;
- Internationalized products;
- Survey on companies and industry interest on herbal medicines;
- Quality of standards issues / lack of clear regulations;
- Convene industry about the opportunities of herbal medicine;
- Limited production capacities;
- Needs of clinical studies, studies about effectiveness;
- Strong competition from Asia;
- Agro companies to be engaged;
- Large investments needed for development
- Size of country – limiting factor.

What currently the biggest opportunities in the Herbal Medicine?

- Prioritize/specialize in order to overcome challenges;
- Experiences in botanic medicine; phytomedicine, phytotherapy, natural medicine;
- Collaboration between different type of business areas;
- Getting herbal medicine at local and European market PR activities;
- Big export potential of herbal medicine;
- New marketing possibilities for herbal medicine product – get it international.

Renewable Energy (17.05.2022)

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

What are currently the biggest challenges by Research Capacities and Infrastructure?

- Assessing incentive policies for renewables;
- Lack of forecasts (weather) with high Geo resolution;
- Micro Grids as opportunity;
- Lack of data on energy demand and supply;
- To make the renewable energy more popular;
- Lack of researcher;
- No data on needed capacities in human recourses - number of persons, directions- market research;
- Mapping identification of gap;
- Electrification of remote rural areas;
- Lack of professionals in domain;
- Need for courses for renewable energies, in-depth training;
- One pilot on renewables;
- In solar – currently only on job training;
- No sustainable way to teach people;
- **SMART GRIDES!**
- Data of existing power supply system;

What currently the biggest opportunities by Research Capacities and Infrastructure?

- Awareness of opportunities for students and researchers;
- Mobility schemes for young researchers as opportunity;
- Lack of data on resources for renewables;
- Mapping of potential for renewables;
- Research infrastructure – on solar energy in preparation.

Green Hydrogen

What are currently the biggest challenges by Green Hydrogen?

- There is a risk that according to the capacities and infrastructures within the future field of hydrogen are created outside of Georgia;
- Strategy development the lines of the EU strategy would be necessary;
- Try to be really high scale projects in Georgia – 50 megawatts projects;
- Hydrogen association in 2021- bridge the gap between business sector interest and research interest;
- Largely influence the development mobility sectors, truck industry, trains;
- Financial support at this stage is crucial, as the real market value of the technology around hydrogen may still be unknown;
- More coherently with the business sector, with research sector interest, with industry needs;
- Further step forwards promoting energy independence;

- Need for strong policy support on longer term;
- Research is needed on the possible application of hydrogen, on the exact benefits, industrially, socially;
- New direction – there are no hydrogen-related policies stated at the moment;
- Lack of financial circumstances;
- High transportation costs;
- Hydrogen promotes energy independence and help to move the energy market to a sustainable low carbon energy supply.

What currently the biggest needs by Green Hydrogen?

- Align private and public views;
- Roadmap that goes one step further;
- Build up document that clarifies the "why", "why hydrogen", "why this jurisdiction", and "why now";
- Coherence with rest of the energy policy, public-private partnerships;
- Are there some negative effect on hydrogen development-impact assessment, ex-ante evaluation;
- Usable information about costs, capital cost on developments of green hydrogens?
- Awareness raising, knowledge building capacities in the hydrogen and the use of this new technologies;
- Building up whole value chain of hydrogen developments.

What currently the biggest opportunities by Green Hydrogen?

- Potential roles of ammonia in a hydrogen;
- Electrolysis of water powered by renewable electricity sunny month;
- Some thoughts/research about trading in ammonia produced by hydrogen;
- Fundamentally existing topographical advantages of the country;
- In cooperation with the Ministry of economy and Georgian Energy Development Fund there is a study of green hydrogen potential right now (roadmap);
- Expertise about technology in area of natural gas;
- Real studies and policy thoughts on how the country could position itself with regard to hydrogen;
- Collaboration with the Germany, with the German Development Bank;
- Impact of developing the new technology on the labor market and the wider economy;
- Lots of international experiences, international best practices.

Solar Energy

What are currently the biggest challenges by Solar Energy?

- Researching the potential of energy community;
- Research on Solar potential;
- Technological aspects;
- Raise in efficiency in solar panels is possible;
- Knowledge about technological aspects is there;
- Research is there but nothing else;
- Theoretical aspects;
- Scarce biomass resource and limited experience with large scale biomass projects;

- Challenges for biomass: waste, landfills should be organized in proper way as well as diversified collection of waste in main cities at least.

What currently the biggest needs by Solar Energy?

- Future steps awareness raising is necessary;
- Political / Social aspects;
- Clear policy making and motivated and dedicated execution teams;
- Lack of communication and awareness of local population (not in my backyard);
- There are no sufficient lands located at the connection points;
- Land owned by government is used by local population (challenge all cutting lands);
- Economic benefits of waste management and renewable energy acceleration should be clearly made available to consumers, awareness increase required.

What currently the biggest opportunities by Solar Energy?

- Economical aspects;
- No infrastructure for blooms expenses for companies;
- Need for incentives to private sector for RE project implementation on commercial / industrial level;
- Business initiatives lack of project financing and support mechanisms;
- Investment opportunities potential of solar energy is high. Utilities studies for Solar Energy legal basis (active policies to open the market, reform of the distribution system in general) net mentoring system?
- Banks can support investors;
- Unclear conditions for investors;
- Legal efforts to create better condition for investors, good potential for Solar Energy;
- A lot of opportunities on black sea cost area and in south system Georgia for the development of Solar.

Food and Agriculture (24.05.2022)

Research to support the development of Food and Agriculture

What are currently the biggest challenges by Research Food Quality and Safety?

- Georgia dramatically needs financial support along with the trainings, consultations of the EU experts to rise their capacities and expertise in food and agricultural sciences;
- Concentrate our attention on sectoral brainstorming / synergy / overall systematic problems and challenges not on singular products;
- Matsoni is just one example, which can be generalized to other potential agricultural foods or products;
- Scientific data, technologies and scientific proof / example Matsoni;
- Gap on Legal and political regulations / to fulfill the European requirements on regulations (accreditation requirements);
- BERD: Science should be financially supported by the producer companies;
- Challenges by the first steps to join the European markets;
- Quality requirements on fruits / vegetables to join the European markets need essential investments;
- ***What kind of clinical studies needed to join the European market?***
- The country needs clear instructions about the requirements of the European food markets;
- Big gap between the industry and research labs performances;
- The country needs information on export regulations, scientific data's, government priority setting act;
- Needs of more practical knowledge for young scientists!!!
- Inform the scientific community about the internal analysis and the priority of Georgian government according food markets;
- Regulation for food laboratory to build up scientific level;
- AWAREBNESS-gaps in the education system;
- Food subject. I am teaching and I see that practically all of my students are tuned to work in the ministries or agencies elaborating regulations and not in science. It would not be possible to happen without scientific knowledge;
- Digitalization of agriculture system need young engineers, monitoring big data are 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…. to determine;
- Business operators too, (Farmers, Producers...) as well as NFA, because often they need to detect some contaminants, or other substances (parameters) that are not regulated, and so accredited laboratories cannot….
- And another problem, we have no PHD programs for food safety in Georgia;
- Problem is the price of this kind of equipment, because even Rustaveli foundation grants cannot cover such huge expenses;
- It is very important for Food Safety risk assessment and analysis overall for emerging risks and development of Food Safety and Quality as a science and research area.

What currently the biggest opportunities by Research Food Quality and Safety?

- The agro-food is one of the driving forces for country economic development should guarantee its products / services quality and safety, which is currently very challenging for Georgian industry;

- In the food safety laboratories, the stuff is able to update their knowledge and skills regularly with changes in regulations, norms and appearance linked with new laboratory equipment and methods;
- Existing EU-projects – Laboratory Health and Safety LLL. This project aims to improve the competencies and employability of young professionals dealing with laboratory services;
- Lots of unique, good quality products – wine tradition of production of Matsoni
- Strong connection / strategy;
- The role of safe and reliable testing and diagnostic laboratories operating across the country is very important;
- Georgia has an opportunity to export GI Food and BIO products in EU market;
- 90% of laboratories in the area of food quality and safety is accredited from the Georgian accreditation institute;
- Opportunities to build up international cooperation (with Germany, France….).

Future Farming and Agricultural Technologies

What are currently the biggest challenges by Future Farming and Agricultural Technologies?

- Probiotics farms are not ready to change to probiotics;
- Testing of probiotics – need for programme from government;
- Waste in food production;
- Most of farmers are not young and for them it seems too difficult, they need simply technologies which will be comfortable for them and easy to course;
- The biggest problem is not knowing new technologies and being satisfied with what they know and not moving forward. However, our ministry has extensionists who are trying to develop more;
- Mushroom production – byproduct as fertilizer for organic food production;
- Climate change – research need to be done;
- New species more robust to climate change;
- Older generation does trust new technologies;
- Financial limits for farmers to buy new technologies;
- "Information vacuum" - farmers do not collect into themselves;
- Examples farmer's associations;
- Green houses funding issue;
- Better cooperation between state agencies and researchers is needed;
- Commercialization of new technologies – GITA programs are not focused on introduction of new technologies.

What currently the biggest opportunities by Future Farming and Agricultural Technologies?

- Probiotics from plant materials;
- Training of farmers – more focus on younger people;
- New technologies will be great interest to farmers, providing a simplification of daily life;
- Wine production – initiation of science and industry cooperation;
- Biorefinery program;
- Biofuels;
- New modern irrigation systems, solar panels will be the best;
- Production of new mushroom varieties (e.g., shiitake, etc.).

Circular Economy (08.06.2022)

Research to support the development of Circular Economy

What are currently the biggest challenges by Research in Waste Management and Circular Economy?

- Problems with hazardous waste (for example chemical wastes), no installations for treatment.
- Not enough support of scientific projects – in the fields of Waste Management with accent on Circular Economy (e.g. lack in high priced equipment);
- In Georgia there is a lot of food waste (50% of MCW) that just goes to the land field result more GHG;
- Generated waste (MCW, Medical waste, hazardous waste, construction and demolition waste (CDW)) inventory in national regulation of sale or right – of waste of raw materials for recycling plants.
- Municipalities do not have the necessary infrastructure for source separation of waste;
- Need infrastructure and equipment for research;
- Confiscation of goods are disposed of in the landfill.
- Lack of awareness on circular economy
- Not sufficient involvement of stakeholders

What currently the biggest opportunities by Research in Waste Management and Circular Economy?

- Knowledge on benefits of Green Economy;
- Biowaste;
- Vertical educational meetings (several age groups);
- Waste separation not present yet;
- Hazardous waste not separated;
- Regulations needed for CDW;
- Awareness and understanding of concept / processes of Circular Economy;
- Awareness raising;
- No awareness of potential recycling;
- Green financing;
- Waste out of stone production – partners for recycling needed (e.g. road construction);
- Center of excellence - information provision;
- Role of science; addressing SME's;
- Promotion of business of recycling of CDW;
- Sustainable procurement – lack of awareness;
- Proper national and international expertise;
- More value in economy less damage to the environment
- 15 concept notes and business plans are under development

What currently the biggest needs by Waste Management and Circular Economy?

- Additional national and international expertise in CDW management.
- Waste as resource for other industries, industrial symbioses.
- Awareness to all stakeholders
- Adaptation and adjustment of existing technologies to the needs and specific conditions of the country.
- Extension of laboratories as scope and renovation of testing equipment.
- Research in technology
- Demand on technologies for recycling of EPR waste streams and links between research and EPR

- All branches in waste sectors need to be involved in Circular Economy implementations
- Incentives for business and innovations
- Map of Circularity for different products

Circular Economy for Construction and Demolition Waste (CDW)

What are currently the biggest challenges by framework and administration conditions?

- Align sectoral policies with recourse efficiency objectives;
- Domestic policy should take into account specific country context – we do not need only one central organization in the topic of circular economy;
- Need to define obligatory separation and recycling processes for C&D waste;
- Many difficulties and challenges to fulfill extended producer responsibility – Georgia – as it is something completely new;
- We need comprehensive understanding of the construction and demolition (C&E) waste research;
- Develop further innovative technologies scientific disciplines + obligatory implementation;
- **What about EPR regulations?**
- We need clear determination who are all concerned of the waste / recycling regulation;
- Collaborations between local governments and the private sector is required, to ensure the different sectors are fully integrated into the new formal system.

What currently the biggest opportunities by research framework and administration conditions?

- Align to the European Legislation and best practice in the field;
- Identify good practices and work towards being guided best practice – better policies;
- Implementation extended producer responsibility – Georgia as the first country in the region;
- Georgia (discussion about EU membership) – is looking for alignments for EU legislation and good practice for all waste streams including construction & demolition waste;
- The national waste management plan means – new rational steps for waste management, formulating new concrete regulation rules;
- Research survey about waste management and demolition waste;
- National waste management action plan highlighting the review process of new legislation, improvements for private / public sector, capacity buildings, general waste management steps.