Moldova
Roadmap on Innovation and Technology Transfer

20 October 2022

Contents

Moldova: Innovation and Technology Transfer Roadmap

1. Background to the roadmap.

The United Nations Economic Commission for Europe (UNECE) is supporting the governments of Eastern Europe, Central Asia and South Caucasus in promoting innovation and ensuring sustainable economic development of the sub-region. In 2022, UNECE published the Innovation for Sustainable Development Review of Moldova (hereafter I4SDR). As a follow up to the I4SDR, UNECE is assisting the policymakers of Moldova in fostering innovative development in the country through a dedicated capacity-building exercise, drawing extensively on the findings of the Review, with the aim of ensuring increased capacity for implementation of its recommendations.

I4SDR chapters 3 (Enhancing the national innovation system and its governance), 5 (Developing Innovation and Technology Transfer Infrastructure in Moldova) and 6 (Leveraging the diaspora for innovation-driven sustainable development), made a number of recommendations to support the development of innovation and technology transfer (I&TT). In alignment with current policy priorities, the Ministry of Education and Research (MER) requested that some of these recommendations be taken forward into a more detailed roadmap, with a view to putting them into implementation through the **National Programme for Research and Innovation (2024-2027)** and **the National Development Strategy (NDS)**.

The specific I&TT related recommendations from chapters 3, 5 and 6 and their anticipated timeframes were:

Chapter 3: Enhancing the national innovation system and its governance

> **Recommendation 3.3.1** Establish a National Innovation Council to coordinate and strategically guide innovation policy formulation and implementation

Chapter 5: Developing innovation and technology transfer infrastructure in Moldova

> **Recommendation 5.1.1** Review the current law on scientific and technological parks and innovation incubators to better stimulate demand and boost the project pipeline.
>
> **Recommendation 5.2.1** Link innovation and technology transfer infrastructure more closely to priority sectors identified under Smart Specialization efforts.
>
> **Recommendation 5.3.1** Establish a national technology transfer office.
>
> **Recommendation 5.3.2** Require PROs to establish a clear intellectual property (IP) policy.
>
> **Recommendation 5.4** Adopt a clear regional focus for innovation and technology transfer infrastructure.

Chapter 6: Leveraging the diaspora for innovation-driven sustainable development

> **Recommendation 6.2.1:** Integrate diaspora engagement across relevant policy areas through policy documents and programmes
>
> **Recommendation 6.4.1:** Establish the DSG under the auspices of the DRB and with support from consulates abroad to streamline scientific collaboration
>
> **Recommendation 6.5.4:** Enhance and maintain trust in diaspora policy development through systematic engagement with diaspora members, including clear and transparent policy mechanisms and implementation tools

Each individual roadmap that follows:

- translates each recommendation into a concrete **strategic goal (SG),** with a timeframe of 3 to 5 years, and sets clear indicators to show measurable achievement;
- identifies possible **barriers and hazards** that might prevent the goal being reached;
- identifies possible **tools and alliances** from the ecosystem and environment that may help the goals to be achieved;
- Sets an **initial direction** (near term objective), with a timeframe of 1 to 2 years and lays out a possible **action plan** that starts the initiative on the road to the final destination, drawing on the above-mentioned tools and alliances and taking into consideration the above-mentioned hazards.

The strategic goals and associated indicators are agreed with Moldovan authorities. Barriers and hazards have been identified through focus groups of stakeholders[1]. The initial directions take into consideration available resources and the feasibility of each action based on the barriers, hazards, tools and alliances.

In is anticipated that each action plan that can be implemented through policy actions.

[1] Focus group 1: Technology transfer
Focus group 2: Diaspora
Focus group 3: Sectoral and regional dimensions of innovation
Focus group 4: Private sector

2. Individual Roadmaps

SG1: Technology Transfer represented on the National Innovation Council (NIC)

I4SDR Recommendation 3.3.1 Establish a National Innovation Council to coordinate and strategically guide innovation policy formulation and implementation.

Key Performance Indicators (KPIs)

TT is visible in innovation policy.

Background to the action

The Review identified a number of shortcomings in the nascent National Innovation System (NIS) related to the implementation and coordination of policy actions across all economic sectors and levels of government. In particular, Moldova presently lacks a common understanding and strategic vision of innovation as a driver of economic growth and sustainable development. Innovation governance is still evolving. It is currently somewhat underdeveloped and not as streamlined as it could be. While key legislative and institutional building blocks are in place, policy efforts are fragmented across a number of ministries and agencies that lack systematic synergies. Furthermore, all levels of government, as well as the institutions that play a role in innovation, lack the capacities to effectively design, implement and monitor innovation policies that include, and systematically engage with, all the relevant stakeholders.

A National Innovation Council (NIC), or similar ministerial body, tasked with developing and putting into practice a holistic perspective on innovation across policy areas, is a widely used tool to tackle the issue of fragmented innovation policy governance that is a natural consequence of the crosscutting nature of innovation. Such a body helps to remove barriers to spontaneous, bottom-up collaboration among innovative actors. An NIC coordinates, aligns and ensures synergies among various stakeholders engaged in innovation policy design and implementation, facilitates action across all policy domains and levels of government, enables systematic engagement of stakeholders, and promotes the dynamism and agility needed to respond to emerging challenges and opportunities.

Such councils are often anchored at the ministerial level, chaired by the Prime Minister, and supported by a strong secretariat. This provides innovation policy issues with a much higher profile and keeps them as important agenda items both within the Government and within government agencies; in other words, in the entire state apparatus.

The scope of issues covered by a NIC is determined by the widely accepted definition and strategic vision of innovation to drive socioeconomic development. Councils targeting innovation outcomes and considering science and research as components of innovation have proven to be a viable approach to unlocking the benefits of innovation for the economy and society as a whole, going beyond scientific and research considerations alone. Determining the best diversity of council membership is also essential: too broad a membership can inhibit effective decision making, while too narrow participation can reduce inclusiveness.

International experience in this regard, such as the Swedish Innovation Council, the Swiss Science and Innovation Council as well as the Georgian Research and Innovation Council, offers good comparative examples to help find the right balance adapted to the national context and innovation governance challenges.

The council should be supported by a clear mandate with matching resources, a comprehensive strategy and supporting secretariat.

Hazards and barriers

- Lack of support from the top e.g. Prime Minister's (PM) Office.

- Lack of consensus among the main stakeholder groups on how the Council should be structured and governed, as well as on its composition and topics to be covered.
- Intervention of other more pressing actions e.g. related to national security.

Tools and alliances

- Experience of the functioning Economic Council (EC) under the Prime minister.
    - The EC which sits close to the PM examines and promotes legislative initiatives and ensures the connection with the business environment. The EC is active and may be interested in the development of TT in enterprises and offer a bridge between the NIC and the Government. It would be helpful if a member of the EC was also a member of the NIC.
- Support and endorsement from major political alliances including the EU.
- International experience such as the Swedish Innovation Council, the Swiss Science and Innovation Council and the Georgian Research and Innovation Council.
- Capacity building from UNECE.

Initial direction

A clear timeline and plan is agreed to establish the NIC that makes provision to include representatives from the TT community

Task owner

MER, as the body responsible for policies

Proposed action plan

- Examine the experience of the Economic Council under the PM, its members, and funding and remuneration of the latter.
- Secure the support of the Prime Minister and establish a secretariat.
- Determine the composition of the NIC based on international best practice (International experience such as the Swedish Innovation Council, the Swiss Science and Innovation Council and the Georgian Research and Innovation Council).
- Agree the scope of issues to be covered by the NIC
- If required, bring the NIC into being through a legal act.

Milestones

- Support of the PM confirmed
- Secretariat appointed
- Council members defined
- If required: Legal act adopted

Summary Roadmap SG1: Technology Transfer represented on the National Innovation Council

Destination (Strategic Goals – 3- 5 year timeframe)
SG1 Technology Transfer represented on the National Innovation Council. Possible KPIs: ➢ TT is visible in innovation policy.

Tools and alliances (Ecosystem + Environment)	**Barriers and hazards (Ecosystem + Environment)**
• Support and endorsement from major political alliances including the EU. • International experience such as the Swedish Innovation Council, the Swiss Science and Innovation Council and the Georgian Research and Innovation Council. • Capacity building from UNECE.	• Lack of support from the top e.g. Prime Minister's Office. • Lack of consensus among the main stakeholder groups on how the Council should be structured and governed as well as composition and topics to be covered. • Intervention of other more pressing actions e.g. related to national security.

Initial Direction (Near-Term Objectives 1-2 years)
A clear timeline and plan is agreed to establish the NIC, with provisions to include representatives from the Technology Transfer community. **Action Plan** • Examine the experience of the Economic Council and its members including funding and remuneration of members. • Secure the support of the Prime Minister and establish a secretariat. • Determine the composition of the council based on International Best Practice (e.g. Swedish Innovation Council, the Swiss Science and Innovation Council and the Georgian Research and Innovation Council). • Agree the scope of issues to be covered by the Council. • Authorise the Council e.g. though a legal Act.

SG2: Revised law on scientific and technological parks and innovation incubators is stimulating demand and boosting the project pipeline.

I4SDR Recommendation 5.1.1: Review the current law on scientific and technological parks and innovation incubators to better stimulate demand and boost the project pipeline.

KPIs

These could include:

- Number of actions taken to attract new residents/hosted companies
- Number of resident/hosted companies
- Number/value of services delivered to companies
- Annual increase of new resident/hosted companies
- Number of personnel of residents involved in R&D&I activities relative to the total personnel
- Annual increase of the personnel of residents involved in R&D&I activities
- Value of residents' production coming from R&D&I activities
- Number/value of TT projects implemented by residents
- Number of implemented patents from resident/ hosted companies
- Revenue from patent implementation
- Number of start-up companies resulting from the activities of residents
- Number of start-up companies successfully activating during three years from the creation
- Revenue from the activities of start-up companies
- Indicators recently proposed by the State University of Moldova and the National Institute of Economic Research (INCE)[2]

It is suggested to select a few strategically important indicators. Note that the underlined indicators arguably go beyond measuring the specific goal of 'stimulating demand and boosting the project pipeline'.

Background to the action

Under the Law on Science and Technology Parks and Innovation Incubators No. 138-XVI of 21 June 2007, fiscal incentives were offered to the residents of science and technology parks (STPs) and innovation incubators (IIs). Additionally, residents at such locations also benefited from reduced rent for their production facilities and offices as well as a provision whereby 95 per cent of their patent costs were covered by the State Agency on Intellectual Property (AGEPI).

A number of STPs and IIs were created after the adoption of the respective law in 2007. However, with the introduction of the revised Law in 2018, the fiscal incentives were lost and no recent activity has been published by any of these two types of infrastructure. Several of them report that they now exist only 'on paper' and the minimum market demand they need to function does not exist. This suggests that the loss of the original fiscal incentives for residents may mean that they are no longer able to compete with other forms of infrastructure e.g. the industrial parks and business incubators. This situation also suggests that co-location with or access to knowledge-based partners and services are not a sufficiently compensatory incentive for private-sector or start-up engagement.

During the 2022 I4SDR stakeholder engagements, it was suggested that the current law on STPs and IIs could be improved by including financial incentives, similar to those offered in its 2007 version. This is seen as potentially beneficial as it would encourage more use of STPs and IIs located within universities. This would also be an important step towards creating a 'level playing field' with the various industrial parks and business incubators who enjoy tax incentives. There is a high degree of

[2] See Letter to NARD from SUM and National Institute for Economic Research

confidence that amending the law in this manner will produce benefits based on the experience derived from the law on IT parks.

However, the Review suggested that other incentives should be offered, running in parallel to the financial ones. The rationale for this approach is that enterprises and start-ups should take the decision to (re)locate to such infrastructures based on the knowledge-based services of the host, proximity to a knowledge provider, and the benefits to be gained from proximity to other similar companies. Solely offering financial benefits will not necessarily attract the type of enterprises that are best suited to benefit from the environment and forge long-term relationships with the associated university. Indeed, by only offering financial incentives, there is a danger that IIs will start competing with business incubators while STPs compete with industrial parks for residents. Rather than simply offer improved financial benefits for tenants and clients of the infrastructure, the law should also consider if an organization should be able to offer a minimum level of innovation support/ knowledge-based services in order to qualify for status as a STP/II, with associated benefits for users. Benefits for tenants and clients should be strongly directed at those that support innovation e.g. patenting and other forms of IPR and access to other R&D&I services.

Input from the Focus Group 1 meeting

Discussions with the focus group on technology transfer suggest that there may be wider problems than simply the lack of fiscal incentives in the legislation. For example, the issue may be related to incomplete implementation of the existing Law (e.g. the state budget that was made available having been lower than originally foreseen) as well as a general lack of other associated funding instruments, needed to allow the incubators and parks to function sustainably. It has also been suggested that there is a general lack of demand from the private sector for services, which will also affect sustainability. Some concrete issues have also been raised, such as ownership of the infrastructure purchased under projects. However, examples of Parks and Incubators that are operating successfully have also been cited, e.g. at Balti State University, along with a suggestion that they would perhaps be willing to embrace new and more innovative operating models rather than being constrained by traditional 'Park' and 'Incubator' approaches. This could include developing Fablabs and working with Tekwill[3]. It has also been suggested that the type and size of business that would engage with such infrastructure is important, and that researchers at larger state-owned businesses, rather than SMEs, may be key players. Finally, it has been suggested that the Law itself is not fundamentally lacking, but that there has not been sufficient time to fully see results and judge the situation.

Hazards and barriers

Identified though focus groups/stakeholder consultation**:**

- Lack of a clear point of responsibility to coordinate the stakeholders.
    - Many different groups beyond the ones traditionally situated under MER are affected by the legislation, e.g. the Ministry of Infrastructure.
- Lack of complementary instruments and measures.
    - The Law may not be able to promote the desired goals by itself, even if it receives the promised state funding. Other measures and support mechanisms will be needed to support incubators and STPs, and they should be able to rely on sustainable funding.
    - The Law may not properly work if it is based solely on state funding. There is a risk of simply pumping money from the public sector to the private sector, potentially leading to unfair competition.

[3] TEKWILL has been designed as a national public private partnership between the Government of Moldova, USAID, Microsoft, and IBM to answer the needs of the ICT industry to close the gap of the human capital shortage, as well as support the development of the entrepreneurship ecosystem.

    - The Law may not function properly without a more comprehensive innovation ecosystem suitable to the economy of the Republic of Moldova, with adapted financial and investment instruments for innovative (technological) business (e.g. business angels, private equity funds, crowdfunding etc.)
    - The Law may not function properly without being integrated in a normative institutional-legal-financial frame for innovative business.
- Poor state of existing Parks and incubators.
    - Existing infrastructure is now very poor. If it cannot be renovated, then a revised law may not help. (This implies a need for other policy instruments to support the legislation).
- Lack of a clear understanding of the needs of the private sector and the 'absorption capacity' of the parks.
    - This issue might be overcome by the Chamber of Commerce, if it could engage with a Business Needs Analysis and help the MER to get a feel for the real potential of the infrastructure.

Tools and alliances

Identified through focus groups/ stakeholder consultation**:**

- Chamber of Commerce
    - May be able to help assess the needs and demands of the private sector, and with a mapping and evaluation of existing facilities.
- New measures that will be implemented in the regions:
    - The Ministry of Infrastructure and Regional Development will fund actions in the future that will cover professional development and creation of services.
- MER able to assess and perform mapping of R&D&I infrastructure available at universities, that could be shared with STPs and innovation incubators, and used by resident/hosted companies under specified conditions.
- National Agency for Research and Development (NARD) able to share experience in previous operating the STPs and IIs (strengths and weaknesses).
- State Agency on Intellectual Property with a wide expertise in intellectual property management.
- Relevant practice emerging from the Support Program for Digital Innovations and Technological Startups, launched on 6 October 2022, managed by the Organization for the Development of Entrepreneurship (ODA) and supported by the Future Technologies Project financed by USAID and Sweden[4].

Initial direction

Existing law on scientific and technological parks and innovation incubators is comprehensively reviewed and changes proposed if their need and benefit can be clearly demonstrated.

Task owner

MER

[4] https://www.privesc.eu/ Archive/100701/Launch-of-the-Program-to-Support-Digital-Innovations-and-Technological-Startups

Proposed action plan

1. Formation of a small task force in the MER to implement the action.

The person with overall authority needs to be at a sufficiently high level to interact with counterparts at other organizations (e.g. Ministry of Economy, Ministry of Regional Development, Ministry of Finance, the Parliamentary Committee on Culture, Education, Research, Youth, Sports, and Mass Media). High level specialists in jurisprudence, economy and finances must also be included in the task force.

Outcome: a clear point of responsibility for the action.

2. Review of the current situation to confirm what has been proposed to Parliament and clearly identify status.

The process should commence internally with a legal review of the current status. This should be undertaken by a person with a professional understanding of how national law is adopted and implemented. There should be a strong focus on understanding the fiscal structure of the current law. The individuals undertaking this review will later act as facilitators to the overall process.

Outcome: a clear legal understanding of the current status of the existing law.

3. Comprehensive consultation with all the main the stakeholders to identify the root causes that might be addressed through amended legislation, including the need for fiscal incentives to create a level playing field with similar organizations (industrial parks and business incubators), and additional benefits specific for STPs and IIs (e.g. support for patenting and knowledge-based services.)

The consultation process needs to be comprehensive and evidence-based. It is important to consult with existing Parks and Incubators, including those that are active and positive about their situation, those that are active but seem to be struggling, and those that are currently not functioning. Also to be consulted are target clients for both Parks and Incubators. If specific barriers are identified by the supply and/or demand side, then these should be comprehensively probed to make sure that the root cause of the problem has been identified. It is important to ensure that problems are real and can be realistically addressed through changes to legislation.

It is also important to consult the impact analysis performed in 2012 regarding the drafting of the new Law to compare whether the law adopted in 2018 contains the proposed improvements to the previous Law no. 138-XV of 2007.

Wider stakeholder consultation should also involve a more in-depth investigation of possible enablers that may address barriers e.g. forthcoming funding from other Ministries for projects that could be utilised by the Parks and Incubators.

Outcome: A clear picture of the root cause of the deficiencies in the existing legislation and a decision as to whether the best solution is new legislation, or whether the current law needs more time to take effect or better linkages to other policy actions and the commercial sector. This decision will also be influenced by the results of tasks 3 below.

4. Review of the business need, current provision of infrastructure and estimated 'adsorption capacity'.

A review of the supply and demand should be carried out in parallel to the investigation into the perceived deficiencies of current legislation. This activity should include a mapping of current Parks and Incubators and their present levels of activity, as well as their potential for increased activity if demand from the commercial sector were increased/more funding became available.

Outcome: A clear picture of the current state of Science Parks and Incubators including their hard infrastructure, soft-service portfolio, level of activity and potential for increased supply of services

(absorption capacity). The report should help the MER to take an informed decision as to whether current legislation is seen to be having a real impact on the current situation and potential for expansion.

5. Assess and perform a mapping of R&D&I infrastructure available at universities, that could be shared with STPs and IIs, and used by resident/hosted companies under specified conditions.

Outcome: A clear picture of the current state of the R&D&I infrastructure at universities including their capacity of providing facilities to resident/ hosted companies of STPs, IIs for addressing their needs in such instruments.

6. Collection of verifiable data to help support the case for amendment (baseline performance).

Indicators of performance should be defined and collected. If an indicator does not yet exist, then the potential to generate it should be investigated or a proxy/alternative should be proposed.

Outcome: A clear picture of current performance with the potential to monitor the effect of change in the external environment e.g. the introduction of new legislation.

Depending on the outcome of the consultation:

If it is determined that there is benefit from redrafting the current Law then the following steps are proposed:

1. Appointment of a legal advisor to draft the revised law.
2. Review of the fiscal stimuli being used in neighbouring countries e.g. Romania and perhaps the Baltics.
3. Drafting of a revised law that addresses the root cause of present deficiencies and the need for revision.
4. Consulting of the draft law with major stakeholders including STPs, IIs and their potential clients.
5. Further amendment and/or request for adoption at national level and promotion of the law to the Parliament.
6. Use of stakeholders to promote the changes to the relevant sectors.
7. Monitoring of KPIs against baseline indicators to assess effect.

Milestones

- Consultation process completed.
- Decision taken on the need and benefit of redrafting legislation.
- (Revised Law drafted).
- (Revised Law adopted).

Summary Roadmap SG2: Law on scientific and technological parks and innovation incubators

Destination (Strategic Goals – 3- 5 year timeframe)
SG2 Law on scientific and technological parks and innovation incubators is stimulating demand and boosting the project pipeline. Possible KPIs: ➢ Number of resident/hosted companies ➢ Number/value of services delivered to companies ➢ Number of personnel of residents involved in R&D&I activities relative to the total personnel ➢ Annual increase of the personnel of residents involved in R&D&I activities ➢ Value of residents production coming from R&D&I activities ➢ Number/value of TT projects implemented by residents ➢ Number of implemented patents from resident/ hosted companies ➢ Revenue from patent implementation ➢ Number of start-up companies resulting from the activities of residents ➢ Number of start-up companies still operation after 3 years ➢ Revenue from the activities of start-up companies

Tools and alliances (Ecosystem + Environment)	**Barriers and hazards (Ecosystem + Environment)**
• Chamber of Commerce able to help assess needs and demands of the private sector and a mapping and evaluation of existing facilities • New measures that will be implemented in the regions (Ministry of Infrastructure and Regional Development) • Ministry of Education and Research able to assess and perform mapping of R&D&I infrastructure available at universities, that could be shared with STPs and IIs, and used by resident/hosted companies under specified conditions • NARD able to share the experience in previous operating STPs and IIs (strengths and weaknesses) • State Agency on Intellectual Property with a wide expertise in intellectual property management	• Lack of a clear point of responsibility to coordinate the stakeholders. • Lack of complementary instruments and measures. • Low involvement of the private and state enterprises in R&D&I activities • Lack of financial instruments for creating a viable innovation ecosystem suitable to the economy of the Republic of Moldova (business angels, private equity funds, crowdfunding, etc) • Lack of concepts, how to elaborate a normative basis to operationalize the identified financial instruments

Initial Direction (Near-Term Objectives 1-2 years)
Existing law on Scientific and Technological Parks and Innovation Incubators is comprehensively reviewed and changes proposed if their need and benefit can be clearly demonstrated via the evidence base. **Action Plan** 1. Formation of a small task force in the MER to implement the action. 2. Review of the current situation to confirm what has been proposed to Parliament and clearly identify status. 3. Comprehensive consultation with all the main the stakeholders to identify the root causes of the problem that might be addressed through amended legislation, including the need for fiscal incentives to create a level playing field with similar organizations (industrial parks and business incubators), and additional benefits specific for STPs and IIs e.g. support for patenting and knowledge-based services. Consultation of the AIR of 2012 regarding the drafting of the new Law to compare whether the law adopted in 2018 contains the proposed improvements to the previous Law no. 138-XV of 2007. 4. Review of the business need, current provision of infrastructure and estimated 'adsorption capacity'. 5. Collection of verifiable data to help support the case for amendment (baseline performance) Depending on the outcome of the consultation: 1. Appointment of a legal advisor to draft the revised law. 2. Review of the fiscal stimuli being used in neighbouring countries e.g. Romania and perhaps the Baltics. 3. Drafting of a revised law that addresses the identified root causes and need for revision. 4. Consulting of the draft law with major stakeholders including STPs, IIs and their potential clients. 5. Further amendment and/or request for adoption at national level. 6. Monitoring of KPis against baseline indicators to assess effect.

SG3: Innovation and TT infrastructure is tied to priority areas identified under the Smart Specialization Strategy (S3) actions

I4SDR Recommendation 5.2.1: Link innovation and TT infrastructure more closely to priority sectors identified under Smart Specialization efforts.

KPIs

These could include:

- Number and amount of sector-focused investments that link to S3 priorities
- Number of different types of infrastructure (hard and soft)

Background to the action

There are encouraging signs that Moldova is continuing to diversify and embrace new approaches to TT and innovation infrastructure and to include emerging priority sectors in these efforts. However, this sector-specific refinement approach is currently focused on the IT sector, with the Tekwill initiative and the independent start-up and acceleration support offered at the many hubs in Chisinau being very IT-centred. This has left several other sectors with important innovation potential, such as health and agriculture, without proper innovation support.

Moldova has committed to developing an S3 (Smart Specialisation Strategy) and this is now reflected in the National Research and Innovation Programme of Moldova for the years 2020-2023.

Sector-specific TT and innovation support mechanisms can be instrumental in encouraging innovation in sectors identified under S3 efforts as having substantial potential for spill-overs at the subnational and national levels. This approach has become increasingly commonplace in the EU, where incubators, accelerators and STPs are tailored to the needs of a sector, while more general support is provided under the mandate of SME agencies and traditional business incubators. Some established entities that serve as good examples in this regard include[5] the CleanTech Incubator (EU), the Green Incubator (Ukraine), the Bucharest Carbon Incubator/Accelerator (Romania), the Prague AI Startup Incubator/ Accelerator (The Czech Republic) and the EBRD Ukraine Climate Innovation Voucher, to name but a few.

The S3 exercise in Moldova offers an opportunity and a strong starting point to plan for more sector-specific support that could be funded in the future via national, EU or donor programs. This may ultimately link to more support at subregional level (see Recommendation 5.4).

Hazards and barriers

- War in Ukraine

The war in Ukraine has lead to a significant loss of confidence by investors who have suspended their funding activities. This situation is hard to influence but it may mean that virtual infrastructure may become a stronger focus for some time.

- Reform of the Public Research Organizations (PROs)

This is an ongoing process that is likely to take precedence over other activities until it is completed. However, in the long term, the creation of larger PROs, including universities, may offer opportunities for strengthening sector-specific technology transfer activities.

- Lack of information regarding value chains

Sector-related value chains have been suggested as a way for Moldova to improve its competitiveness. However, there is a lack of data to help address the issue. (See also above).

[5] See the I4SDR for full information on these initiatives.

- Low communication between members of the quad helix

The different actors in of the quad helix (science, policy, industry, and society) do not find it easy to locate each other and to communicate. There is a lack of platforms that would bring them together and help to disseminate information. As a result, it is hard for any group to know what is needed or could be supplied by others and identify what should be offered.

- Lack of political will and necessary understanding by public servants of the R&I sector and how to prioritize R&I and carry out adequate reforms.

RDI (Research Development and Innovation) is a specialised area and there are still an insufficient number of public sector employees who understand it well and can see how to integrate it into wider policy actions e.g. regional development.

- Lack of funding for CTTs and Innovation administration

Funding for specialised infrastructure like Centres for Innovation and Technology Transfer is low. It is also hard to secure the funds to pay for the necessary support actions that need to take place in new facilities, including administration and similar positions.

- Lack of funding for the commercial sector

Instruments to support the commercial sector are limited. This reduces their ability to participate in actions that would necessitate using infrastructure.

- Lack of trust between business in Moldova and state institutions, international partners and each other.

There is a general lack of trust between partners. Unless this trust can be generated, the needed ecosystem is unlikely to form and function efficiently.

- Lack of knowledge

There is a general need for better information so that each participant can understand their role and position in the ecosystem.

Tools and alliances

- The ongoing S3 process

The impetus for defining and adopting a S3 is likely to increase with EU candidate status. The S3 will identify specific priority niches based on an assessment of strengths as well as the entrepreneurial discovery process. This process and the resulting strategy will provide a very strong starting point for focused investment into innovation-related infrastructure using national, EU and donor funding.

- Cross Border funding for S3 related activities

Cross-border funding actions with Ukraine, Romania and the Danube region are taking an S3 approach and focusing their funding on priority sectors. These offer an opportunity to drive forward with a sector specific approach.

- Private investment for promising sector-based opportunities

There is a global trend for the private sector to support early-stage incubation and acceleration of innovative start-ups. This is likely to be followed in Moldova.

- Existing initiatives that could act as the starting point or model for similar initiatives focused on other sectors.

Moldova has a number of existing initiatives that have focused on the IT sector as well as cross-border and transnational actions (e.g. North RDA CINEMA project for the creative industries). These may offer starting points or models for sideways expansion/replication into other sectors.

- Linking of priority areas

Given scarce resources, using existing infrastructure to encourage linkages between the four emerging priority areas would be a way to make best use of infrastructure and really realise the power of cross-sector innovation.

Initial direction

Identify one or more pilot actions that can be launched that support the S3 strategy.

Task owner

To be determined

Proposed action plan

1. Gap Analysis: Mapping of current provision of hard and soft services, aimed at the S3 priority sectors, combined with a needs analysis from the priority sectors.
2. Identification and capture of good practice examples that meet needs, including national or regional level ones, such as Start-up City Cahul and TTC Balti.
3. Propose development plan based on prioritisation of needs and possible funding opportunities, and include a plan for existing I&TT infrastructure to refocus and specialise, and measures to encourage international linkages to similar activities abroad (mentoring and twinning), including with the EU.
4. Pilot action(s) linked to the S3 e.g. strategic priorities for Balti, that make a deliberate attempt to simultaneously address more than one priority area.

Milestones

- Report on gap analysis on I&TT infrastructure for the priority sectors.
- Proposed development plan with clear funding needs linked to pilot actions.

Summary Roadmap SG3: Innovation and TT infrastructure is tied to priority areas identified under the S3 actions.

Destination (Strategic Goals – 3- 5 year timeframe)
SG3 Innovation and TT infrastructure is tied to priority areas identified under the S3 actions. Possible KPIs ➢ Number and amount of sector focused investments that link to S3 priorities ➢ Number of different types of infrastructure (hard and soft)

Barriers and hazards (Ecosystem + Environment)	**Tools and alliances (Ecosystem + Environment)**
• War in Ukraine and associated suspension of funding • Ongoing reform in the PRO sector • Lack of information regarding value chains • Low communication between quad helix • Lack of political will and necessary understanding by public servants of the R&I sector and how it works, to prioritize R&I and carry out adequate reforms. • Lack of funding for CTTs and administrative support • Lack of funding for the commercial sector • Lack of trust between business in Moldova and state institutions, international partners and each other. • Lack of knowledge	• The ongoing S3 process that will identify specific priority sectors • S3 related X-border funding opportunities (Ukraine, Romania, Danube region) • Private investment into start-up programs • Existing initiatives that could act as the starting point or model for similar initiatives focused on other sectors. • Linking of priority areas

Initial Direction (Near-Term Objectives 1-2 years)
Launch of pilot actions linked to the S3 1. Gap Analysis: Mapping of current provision of hard and soft services, aimed at the S3 priority sectors, combined with a needs analysis from the priority sectors. (Some info already exists). 2. Identification and capture of good practice examples that meet needs. 3. Propose development plan based on prioritisation of needs and possible funding opportunities, and include a plan for existing I&TT infrastructure to refocus and specialise, and measures to encourage international linkages to similar activities abroad (mentoring and twinning), including with the EU. 4. Launch (pilot) multi-priority sector action(s) e.g. establish platforms to bring together the quad helix.

SG4: A national technology transfer office (NTTO) is established.

I4SDR Recommendation 5.3.1: Establish a national technology transfer office.

KPIs

These could include:

- Number of projects being commercialized (size of pipeline)
- Number of patents filed (national and international)
- Number of sale/ licensing agreements (national and international) executed
- Size of licensing revenue generated
- Number of start-ups created based on the technology pipeline
- Number of start-ups created from NTTO technology operating three years after their creation

The baseline will be zero and the targets must be feasible. Hazards and barriers to realizing results should be carefully considered.

Background to the action

The least developed type of innovation infrastructure in Moldova is that which supports classical TT from the public to the private sector and facilitates research commercialization through sale and licensing of intellectual property rights. While funding is present for TT activity from NARD in the form of TT grants, there is very little institutional support to validate research results and transfer them to the market. Such validation and transfer processes require specialized skills to assess the market for a new product and help the research team to refine it to meet market needs. Furthermore, funding is required for intellectual property actions, technology adopter identification and the negotiation of transfers. These are typical activities for a Technology Transfer Office (TTO) and the quality of the skills and experience of its personnel is critical for the success of such activities.

Moldova is not currently investing heavily in public research. However, there are pockets of excellence within the economy, scattered across different sectors and institutions. Individually, these are unlikely to provide a sufficiently strong innovation pipeline to allow any single organization to employ a team with the diverse skills needed to successfully develop and/or commercialize innovative technology based on research results. Establishing a TTO with one or two generalists, who can manage a small number of mildly innovative projects, will not lead to the office developing the skills needed to realize the full potential of any significant R&D projects that arise in the future. In this situation, there is often a focus for TTO staff on awareness-raising and educational activities for researchers to initiate culture change. While these are important activities to stimulate TT, they require very different skills than those needed to sell technology to the business sector.

Against this background, there is merit in pooling the various technology pipelines from multiple PROs to attain the critical mass of research outputs necessary to sustain a national TTO. This 'hub and spoke' model can make it economically viable to recruit the highly specialized individuals needed to formulate and implement a strong IP strategy, undertake market research as well as negotiate and execute licensing deals. Such a construction also makes it possible for contributing PROs to get access to a patent fund for their research results. Examples of NTTOs that have been established in the wider region e.g. Georgia, offer some good practice starting points and useful lessons learned.

Hazards and barriers

Identified through focus groups/ stakeholder consultation:

- Lack of support from PROs and their researchers for an external TTO
- Low innovation potential of current research results/unrealistic expectations of financial returns
- Lack of an accessible/affordable pool of skilled human resources to manage and operate the NTTO and generate success stories

- Lack of funding for both the pilot and the follow-on action - sustainable funding - patient investment model
- Lack of a suitable legal structure that fits the Moldovan legislative framework and/or lack of consensus on where the NTTO should be situated if part of a larger organization
- Lack of a suitable legal structure that will allow the NTTO to be funded by both the state budget but also generate income from services to have financial autonomy
- Lack of (domestic) demand for the research results
- Lack of high-tech processes in public and private companies, SMEs
- Lack of innovative potential in public and private companies, SMEs
- Lack of a complex innovation ecosystem, of which NTTO should be an element

Tools and alliances

Identified through focus groups/ stakeholder consultation:

- Regional success stories (TTPP Georgia) and associated experience
- Coordinated financial assistance from international partners, including the World Bank, IMF, the EU and the EBRD
- Existing patent portfolios at PROs
- Experience at NARD
- Possibility of a Public-Private Partnership structure under the law.
- Support of National Council
- New National Contact Points (NCPs) for Horizon Europe
- Report on the Innovation Ecosystem of the Republic of Moldova, carried out by the United Nations Industrial Development Organization (UNIDO) in the context of its Country Programme for inclusive and sustainable industrial development in the Republic of Moldova 2019-2023

Initial direction

Feasibility study and action plan for a NTTO is prepared.

Task owner

To be determined

Proposed action plan

Phase 1

1. Carry out a feasibility study including a costing to establish and operate an NTTO for a minimum of 3 years.

A feasibility study will be critical. It should attempt to draw on experience from the MITA TTPP. It must cover:

- Technology supply and associated support
  - Commitment to the concept from strong research-performing PROs
- Human resources
  - Feasibility of securing specialised skills, including availability and cost
- Funding and operational model
  - If the activity is to start as a pilot, then the issue of long-term sustainable funding needs to be considered.
- Location, governance structure and legal format

- Agreement would need to be reached as to where the NTTO would be located, its legal format, and how this would influence its funding and governance.

Outcome: Feasibility study laying out the pros and cons of taking an NTTO forward.

Phase 2

If the feasibility study is positive, then the following further steps are suggested:

1. Identification and securing of finance (from the state budget or donor-funded activities)

2. Recruitment of a team

Recruitment of the skills needed for research commercialization may be difficult from the domestic pool. Skills may exist in the private sector and in the diaspora. This might be considered when costing the activity. It is also important to keep this in mind when agreeing on the legal status of the NTTO, as it may need to be independent of academic salary scales to be able to recruit the right people.

3. Launch of a call for projects

The call for projects is likely to be competitive e.g. ensuring that results with the highest potential for international commercialization are selected, alongside clear commitment from the researchers to support the commercialization process. The evaluation and selection criteria therefore need to be carefully formulated.

Milestones

- Feasibility study, including financial plan, is accepted and funding secured for associated policy measures.
- A team is recruited for the NTTO
- The NTTO is launched with a call for projects

Summary Roadmap SG4: National Technology Transfer Office (NTTO)

Destination (Strategic Goals – 3- 5 year timeframe)

SG4 A national technology transfer office is established.

KPIs:

- No. Projects being commercialized (size of pipeline)
- No. of patents filed (national and international)
- No. Sale/ licensing agreements (national and international); size of revenue generated.
- No. of start-ups created based on the technology pipeline ofertei tehnologice
- No. of start-ups operating three years after their creation

Barriers and hazards (Ecosystem/ +Environment)

- Lack of high-tech processes in public and private companies, SMEs
- Lack of innovative potential in public and private companies, SMEs
- Lack of support for the concept by PROs and researchers.
- Low innovation potential of current research results/ unrealistic expectations of financial returns
- Lack of (domestic) demand for the research results
- Lack of an accessible/affordable pool of skilled human resources to manage and operate the NTTO
- Lack of funding for both the pilot and the follow-on action - sustainable funding model.
- Lack of a suitable legal structure that fits the Moldovan legislative framework and/ or lack of consensus on where the NTTO should be situated if part of a larger existing organization.
- Lack of a complex innovation ecosystem of which NTTO should be an element

Tools and alliances (Ecosystem/ +Environment)

- Regional success stories and experience (e.g. Georgia's Innovation and Technology Agency)
- Coordinated financial assistance from international partners, including the World Bank, IMF, the EU, and the EBRD
- PROs with an existing patent portfolio
- National Council
- NARD
- Legal possibility of a PPP structure
- New NCPs for Horizon Europe
- UNIDO mapping of Moldova's innovation ecosystem

Initial Direction (Near-Term Objectives 1-2 years)

1. Feasibility study and action plan for a NTTO is prepared.

Action Plan

Phase 1

1. Feasibility study including a costing to establish and operate an NTTO for a minimum of 3 years

Possible Phase 2

1. Identification and securing of finance
2. Recruitment of a team
3. Launch of a call for projects

SG5: PROs have adopted a clear intellectual property policy.

I4SDR Recommendation 5.3.2: Require PROs to establish a clear IP policy.

KPIs

These could include:

- Number of IP policies adopted/ % of (public) PROs with a policy in Moldova.

Background to the action

Although IP rights are not currently much used by Moldovan PROs to commercialize their research results, clear legal ownership of results lays the foundation for transfer and commercialization. This situation holds true both for commercialization by a PRO or through a centralised NTTO model or even if researchers have been offered "professors' privilege" under national or organizational regulations. Ownership of results, and how they will be commercialized along with how any financial benefits will be shared between different stakeholders is best encapsulated in an Intuitional IP Policy. This should reflect national law and institutional culture and preference. Without such a document, technology adopters and financial investors are reluctant to engage in transfer. Lack of a clear framework for ownership and benefit sharing can also act as a deterrent to researchers who wish to commercialize their technology and who wish to see legitimacy and agreed reward from their efforts.

National legislative frameworks that regulate ownerships of 'employee inventions' also apply to PROs making the PROs the legal owner. However, there is very little evidence of the existence of IP policies at Moldovan PROs, despite a previous initiative funded through the Trans-European Mobility Programme for University Studies (TEMPUS). Although the law may be used to establish ownership, it would be beneficial for an internal IP policy document to lay out out revenue sharing in the case of successful commercialization. It would also be beneficial if IP policy made clear provision for use of an NTTO or similar support organization.

The lack of any reported need for such policies suggests that a simple light-touch regulation that clarifies the current legal situation would be appropriate and would facilitate the use of a NTTO to commercialize the strongest results. A number of IP policy good practice templates exist, particularly those developed by the World Intellectual Property Organization (WIPO) under its University Initiative. WIPO has also previously supported development (customization) and adoption of such policies.

Institutional IP policy would pave the way for increased legitimate and incentivised academic entrepreneurship and facilitate the use and success of a NTTO.

Some countries make development of an IP policy compulsory for a PRO to access research funding, or add it to the list of positive attributes to be considered when assessing organizational performance. However, making IP policy compulsory can have unintended results. For example, if the PRO is not able to take on the responsibility of commercialization, this can stifle existing academic entrepreneurship and actually reduce technology transfer.

The fact that previous initiatives by Moldova to develop IP policy do not seem to have had a strong effect needs to be considered in any future initiatives, for example by commencing with a small study as to why the initiative was not more successful.

Hazards and barriers

Identified through focus groups/ stakeholder consultation:

- Lack of interest from institutions in revisiting an idea that has been explored previously via projects
- Resistance from researchers who see this as a threat to informal professors' privilege
- Lack of interest from institutions in prolonging action of patents after their expiration
- Lack of interest from institutions in licensing patents

Tools and alliances

Identified through focus groups/ stakeholder consultation:

- Support from MER for institutional policy linked to use of a NTTO or future funding
- Support from WIPO
- Success stories e.g. Technical University patent sale - Tronciu Vasile
- Development of a network of TTOs

Task owner

To be determined

Proposed action plan

Phase 1

1. Review of the current status and national and international best practice

The review should confirm the status of IP policy at all the main research-performing universities and institutes. It should also identify any national good practice and practice that is considered to be particularly relevant from peer countries.

2. Investigation as to why the previous initiative under TEMPUS seems to have yielded only one adopted IP policy

In parallel with examining the current status, an investigation should take place into why the project under TEMPUS does not seem to have been more successful in getting PROs to adopt policies.

Outcome: Status report including a clear conclusion on why the activity has not been more successful in the past and recommendations on how to address the barriers/ resistance in a future initiate.

Phase 2

Assuming that the investigation yields a clear way forward:

1. Formation of a working group of PROs (possible inclusion of the WIPO University IP policy group)

The working group should include the AGEPI as well as legal professionals able to draft internal regulations for PROs. It should also involve stakeholders from the PRO management and research base (academia) as well as business. The latter group will be important to consult as it will also be using the policy if it wants to engage in tech transfer with the PROs. It may also be possible to involve the WIPO University Initiative. In addition, it might be advisable to involve NARD in this activity as it has a good overview of science-business relationships and the needs of technology transfer projects.

2. Drafting of model IP policy for customization by all Moldovan PROs

It may be possible to draft a simple model IP policy that reflects national law but that makes provision for TT support from external organizations e.g. a NTTO. Any such document should not simply follow international best practice (e.g. as proposed by WIPO), but also take into consideration the reasons why the TEMPUS initiative did not result in more IP regulation adoptions by the project partners.

The model IP policy should be suitable for adoption with minor adaptation by Moldovan PROs.

3. (Possible Ministry requirement that all public PROs develop and adopt such a policy)

This step should be very carefully considered. Examining both national and international experience may be beneficial to ensure that such a move does not have unforeseen repercussions.

4. Adoption of IP policies by participating PROs

This is a critical step. Commitment to adopting the policy needs to be maintained throughout the activity to avoid a repeat of the TEMPUS outcomes.

Milestones

- Model policy is published
- Individual institutional policies are adopted

Summary Road Map SG5: PROs have adopted a clear intellectual property policy.

Destination (Strategic Goals – 3- 5 year timeframe)
SG5 PROs have adopted a clear intellectual property policy. **KPIs** ➢ Total number of IP Policies adopted. ➢ % of PROs with a policy in Moldova.

Barriers and hazards (Ecosystem + Environment)	Tools and alliances (Ecosystem + Environment)
• Lack of interest from institutions in revisiting an idea that has been explored previously via projects. • Resistance from researchers who see this as a threat to professors' privilege • Timing - current reorganization (Institutes being adsorbed into universities) making other actions a higher priority for PROs. • Lack of interest from institutions in prolonging action of patents after their expiration • Lack of interest from institutions in licensing patents.	• Support from MER for institutional policy linked to use of a NTTO or future funding. • Support from WIPO. • Success stories e.g. Technical University patent sale. • Development of a network of TTOs.

Initial Direction (Near-Term Objectives 1-2 years)
Model IP policy is drafted for customisation by all PROs. 1. Review of the current status and national and international best practice. 2. Investigation of why previous initiative (TEMPUS) seems to have yielded only one adopted IP policy. 3. Formation of a working group of PROs (possible inclusion of the WIPO University IP policy group) 4. Drafting of model IP policy for customisation by all Moldovan PROs 5. (Possible Ministry requirement that all public PROs develop and adopt such a policy) 6. Adoption of IP Policies by participating PROs

SG6: A clear regional focus for innovation and TT infrastructure has been adopted.

I4SDR Recommendation 5.4: Adopt a clear regional focus for innovation and TT infrastructure.

KPIs

- Number and diversity of recognised I&TT infrastructures outside the capital
- Contribution from infrastructure to local economic growth

Background to the action

Similar to the benefits that flow from providing sector-specific infrastructure, there are benefits in developing infrastructure that is tailored to a particular region. Regions often have a clear natural focus for their innovation activities (e.g. food and agriculture or textiles), as well as their own HEI strengths and business needs. If regional strengths and needs are not sufficiently met by suitable infrastructure, the regions will become increasingly less competitive and skills progressively lost, as skilled workers will migrate to better-supported sectors or to new locations in Moldova or abroad.

There is a current strong government focus on providing virtual innovation infrastructure to organizations in the capital, particularly incubation and acceleration services for the IT sector. In line with this, physical infrastructure has tended to be concentrated in a small number of locations. A promising development is that the need for more geographically spread physical infrastructure is being partially addressed through the 12 planned multi-functional platforms and the three planned ITTCs. It is also encouraging to see Tekwill's success in scaling-up at the subnational level and that Start-up city Cahul, which is clearly regional in nature, has plans to expand into other regions (e.g. Comrat).

Customization of infrastructure that supports national development strategies is a useful way to encourage a bottom-up approach to local innovation and TT. This customization process can include enabling regions to design schemes for virtual infrastructure that cater to their local needs and strengths, while still aligning with the goals of the national innovation strategy. Poland serves as a good example in this regard, where regional development agencies (Marshal Offices) have been designing their own pilot schemes to help TT and Knowledge Transfer from PROs to private enterprises. This approach was adopted to increase the competitiveness of each region based on the strengths of local high schools and universities, while meeting the specific needs of local companies.

Moldova already has some good examples of regional initiatives tied to I&TT, e.g. the development of the Center for Innovation and Technology Transfer of the North Development Region in Balti[6]. There is also a Regional Development Fund (RDF), although this currently does not have a clear budget line for innovation actions. The Regional Development Agencies (RDAs) and local universities are a good starting point to strengthen this initiative, especially this can also be linked to Recommendation 5.2.1.

Hazards and barriers

Identified through focus groups/ stakeholder consultation

- Lack of statistical data available to RDAs and others on innovation activity and performance

The lack of data means that there is no strong evidence base for stakeholders to use when identifying needs, designing regional actions and monitoring impact. This may also have a negative effect on investment confidence.

- Lack of enough PROs outside the capital to act as a legitimate hub for development of I&TT activities under the MER (currently limited to Balti, Cahul and Comrat)

[6] https://gov.md/en/content/construction-center-innovation-and-technology-transfer-north-development-region-started

There has been a lack of regional PROs that can act as a hub for local enterprise innovation. This situation may change with the consolidation of the PROs and reform of the sector.

- Limited number of enterprises who can implement at regional level and a lack of opportunities for students to transfer and realise their skills

The number of enterprises outside the capital who have good absorption capacity for specialised knowledge is low. This means that students graduating with specialised knowledge can find it hard to find placements or secure jobs outside the capital.

- Lack of local ecosystem / local services / critical mass

Overall, the innovation and technology transfer ecosystem outside Chișinău needs further strengthening and lacks critical mass. There are few existing services for innovation or TT that could act as the basis for expansion or good practice transfer.

- Lack of funding allocated to regional actions

Although a Regional Development Fund exists, it does not currently reflect any innovation and technology transfer aspect. It is more focused on general regional development with some sectors being more recognised (e.g. tourism).

- Small replicating funds from international partners

Funds available from international partners for local activities tend to be very small. Often, they simply replicate what is happening at the national level rather than leaving any options for regional specialisation.

Tools and alliances

Identified through focus groups/ stakeholder consultation:

- Result of the S3 entrepreneurial discovery process, should it uncover regional opportunities

Although the S3 development may consider Moldova at a NUTS 1 level, the Entrepreneurial Process of Discovery (EPD) may well uncover niche strengths and opportunities for innovation at the local level. These could be taken forward into local actions by involving local PROs and the RDAs.

- Consolidation of the PROs (reform of the sector) and some good regional HEIs e.g. Comrat University.

The reform of the HEI and PRO sectors offer an opportunity for a region to gain stronger access to R&D&I activities in the future, even if the source is a new parent located at a distance.

- Good practice examples of existing or planned regional programs

Existing initiatives that have expended beyond the capital or that are already active in a region and offer a transferable good practice e.g. Tekwill, Start-up city Comrat, ADR Gagauzia – KT partnership program. Such programs could be examined and adopted by other regions if they can also secure the necessary funding.

- RDAs and their development plans, aimed at the RDF

The development plans of RDAs offer a potentially very strong opportunity to design and implement regional level I&TT actions, particularly if they are linked to a regional development fund.

- New measures that will be implemented in the regions (Ministry Transportation and Regional Development).

There are ongoing plans for new funding actions at subnational level that may offer opportunities for R&D&I.

- Innovation incubators re-launched within universities

New Innovation incubators might be restarted, particularly if the Law is amended and implemented.

Initial direction

Design of pilot actions

Task owner

To be determined

Proposed action plan

If all actions need to be managed centrally

1. Execution of a needs analysis that examines the need for more I&TT support outside the capital and also the potential for PROs outside the capital to host such an initiative linked to the RDF and activities, such as the Innovation Center in Balti. This may be linked to work on the S3.
2. Identification of good practices and operational models from ongoing initiatives that started in the capital and were transferred successfully beyond, which offer a basis for further expansion to other regions. These should include an identification of the critical framework conditions for successful transfer.
3. Compilation of a priority list of actions, budget and associated timeline to develop and implement.

If a mechanism exists or can be created for budget being 'managed' at regional level e.g. the RDF and a budget line for I&TT actions:

1. Examination of possible mechanisms (instruments) that would enable regions to design their own programmes to provide more virtual innovation infrastructure and support local innovation capacities.
2. Establish a stakeholder group to design actions that reflect local strengths, align with the national strategy for innovation, and leverage the opportunities offered through physical infrastructure such as the various multifunctional platforms and planned ITTCs.
3. Design and cost pilot actions
4. (Launch pilot actions)

Milestones

If all actions need to be managed centrally

- Needs analysis identifying need for, location and 'host' for an action.
- Good practice examples and transformational pathway agreed
- Priority list agreed and action plan formulated

If there is a mechanism for budget being 'managed' at regional level

- Mechanisms for regional actions identified
- Regional stakeholder groups formed
- Pilots designed and costed

Summary Roadmap SG6: A clear regional focus for innovation and TT infrastructure has been adopted as part of the national regional strategy.

Destination (Strategic Goals – 3- 5 year timeframe)

SG6 A clear regional focus for innovation and TT infrastructure has been adopted as part of the national regional strategy.

KPIs:

- Number and diversity of recognised I&TT infrastructures outside the capital.
- Contribution from infrastructure to local economic growth

Barriers and hazards (Ecosystem/ +Environment)

- Lack of statistical data available to RDAs and others on innovation activity and performance
- Lack of PROs outside the capital to act as a legitimate hub for development of Innovation and TT activities under the MER.
- Limited number of enterprises outside the capital who can undertake innovative activities.
- Lack of opportunities for students to find employment outside the capital'
- Lack of local ecosystem/ critical mass/ local services
- Small funds from international partners, particularly for infrastructure projects and what is available often it replicates work done at national level.

Tools and alliances (Ecosystem/ +Environment)

- Result of the S3 entrepreneurial discovery process if the EPD identifies sub-national level opportunities.
- Consolidation of the PROs (reform of the sector) and some good regional HEIs. e.g. Comrat University.
- Good practice examples of existing regional programs e.g. ADR Gagauzia – KT partnership program.
- RDAs and their development plans, aimed at the RDF.
- New measures that will be implemented in the regions (Ministry Transportation and Regional Development).

Initial Direction (Near-Term Objectives 1-2 years)

Design of pilot actions

1. Needs analysis that examines the need for more I&TT support outside the capital and also the potential for PROs outside the capital to host such an initiative. This may be linked to work on the S3.
2. Identification of good practices and operational models from ongoing initiatives that started in the capital and were transferred successfully beyond, which offer a basis for further expansion to other regions. These should include an identification of the critical framework conditions for successful transfer.
3. Compilation of a priority list of actions, budget and associated timeline to develop and implement.

SG7: Diaspora engagement reflected in policy documents (e.g. NDS)

I4SDR Recommendation 6.2.1: Integrate diaspora engagement across relevant policy areas through policy documents and programmes (e.g. a national development strategy).

KPIs

Could include:

- Number of statements that are reflected in policy documents and measures.

Background to the action

Assuming that it can be sufficiently mobilized and targeted, the diaspora's potential contribution as a driver for innovation-driven sustainable development in Moldova is already well recognised. However, existing engagement mechanisms are not able to systematically utilize this potential. To achieve significant and widespread diaspora participation in innovation, it is important to integrate diaspora engagement across relevant policy areas through policy documents and programmes (e.g. explicit referrals to the substantial potential of the diaspora to boost innovation and contribute to solving socioeconomic challenges in the NDS; designing programmes on skills development, validation and recognition for labour migrants).

Achieving this action will require the relevant ministries to each make a clear statement of their desire for and purpose in engaging with the diaspora. Individual statements can then be translated into actions and policy measures.

Hazards and barriers

Identified though focus groups/ stakeholder consultation:

- Lack of a universally accepted definition of diaspora
- Lack of a clear understanding of the potential contributions of different types of diaspora. This is linked to:
    - Lack of a clear mapping of the diaspora to capture their profiles (e.g. whether they are scientists, academics etc.) and what can they offer
    - Challenges in tracking and contacting the diaspora abroad, particularly those who hold Romanian citizenship and thus are not known to Moldovan embassies
    - Lack of a clear needs analysis, linked to concrete demands that also reflect market forces, so that policy actions do not artificially support initiatives that are not working
    - A need for a better understanding of the knowledge transfer mechanisms for both supply and demand sides
- Lack of analysis to improve understanding of why previous initiatives have not been successful
- Possible lack of alignment between the top-down approach of national policy makers defining needs and a bottom-up approach (PROs defining their needs)
- Too strong a focus on policy making and not policy implementation
- Lack of realistic expectations of when diaspora support from abroad can really have an effect on a national policy initiative (E.g. there is sometimes no capacity to provide concrete answers to complicated questions via the diaspora).
- Too strong a focus on STEM and not sufficient involvement of Social Science, Arts and Humanities (SSAH)
- Bureaucratic and complicated mechanisms to implement projects

Tools and alliances

Identified though focus groups/ stakeholder consultation:

- Diaspora Relations Bureau (DRB) and in particular its existing indicators, which assess the level of integration of diaspora priorities into broader policy and could be further extended to measure policy impact
- University rectors and strategic development plans, which could include a clear indication of how engagement with diaspora would be valuable
- Alumni associations at universities
- Think tanks and government initiatives working on diaspora engagement plans and policies
- Chamber of Commerce and industry, to support dissemination and awareness raising
- Ministry of Education and Research and Ministry of Economy
- Examples of specific diaspora policy interventions that have worked abroad and that fit closely to a well identified need

Initial direction

All relevant Ministries to individually formulate a clear statement of their desire and purpose of engaging with the diaspora, based on improved understanding of Moldovan needs and diaspora profiles. Individual statements should then be translated into actions and policy measures.

Task owner

To be determined

Proposed action plan

1. Needs Analysis

Launch of a bottom-up Needs Analysis (NA) involving PROs and other stakeholders, preferably led by the DRB. The NA should be linked to the strategic plans for PROs and should reflect identified trends and market forces. Ideally it would encompass STEM and SSAH, and also reflect the views of the private sector.

Outcome: A clear Needs Analysis that is linked to the strategic planning of PROs and the views of the private sector.

2. Mapping of the diaspora

This activity needs to commence with an agreement on the definition of the diaspora who will be mapped. It will be used to achieve an improved understanding of the profiles of individuals who meet the definition of diaspora, and will identify what they might be able to contribute and the optimum method of knowledge transfer.

The mapping could incorporate an online self-registration tool. This would help to deal with the issue of the double citizenship of some diaspora members, as well as management of personal data.

Outcome: A clear overview of different profiles, potential contributions, and optimum methods of engagement.

3. Each relevant Ministry to formulate a clear statement of their desire for and purpose in engaging with the diaspora.

Different Ministries will have slightly different aims and objectives in involving the diaspora in their policy actions. Each interested Ministry should start by formulating a statement that clearly explains their interest in and commitment to engaging with the diaspora, and lays out its purpose in doing so from the perspective of innovation and technology transfer. Statements should clearly indicate the target groups inclusion, for example by specifying skill levels (e.g. “highly skilled”, “less highly skilled”). Statements could be simple (e.g. ‘*We will encourage and invite professors from abroad to…*’).

Outcome: A set of clear policy statements, indicating the direction of policy actions on diaspora

4. Each Ministry to translate their purpose into feasible policy actions.

Policy actions may be small in the beginning, but must be concrete and feasible and should clearly reflect the type of group they were aimed at. For example, they might aim to involve diaspora in bringing innovation to agriculture in a certain region. This could start with online workshops delivered by diaspora, investments by diaspora, or finding ways to link diaspora in a formal or semi-formal collaboration with a company in Moldova.

Outcome: A set of policy actions that reflect needs and market forces, with sufficient budget allocated to ensure implementation.

5. Each Ministry should set targets and relevant KPIs.

Every action should have a target, with progress measurable with indicators that are either already available or that can be set up. KPIs need to be challenging, but realistic and achievable. They could target and measure the level of engagement in an activity or the size of investments, and be specific to a certain region or sector.

Outcome: A set of KPIs that are available and can be collected by the DRB.

6. DRB to monitor the KPIs as part of their indicator set.

The DRB is already collecting 64 indicators related to this policy activity. Provided that it has the capacity, it would be a suitable organization to collect indicators related to this task.

Outcome: Indicators available to stakeholders.

Milestones

- Needs assessment completed
- Mapping completed
- Individual participating ministries have each formulated a statement
- Statements translated into clear policy actions that are visible in policy documents
- KPIs set for individual policy actions
- First (baseline) dataset published by DRB

Summary Roadmap SG7: Diaspora engagement reflected in policy documents

Destination (Strategic Goals – 3- 5 year timeframe)
SG7 Diaspora engagement reflected in policy documents (e.g. NDS) ➢ KPI: Number of Ministerial diaspora statements that are reflected in policy documents and measures

Barriers and hazards (Ecosystem + Environment)	Tools and alliances (Ecosystem + Environment)
• Lack of clear understanding of potential contributions from different types of diaspora. • Lack of analysis to improve understanding of why previous initiatives have not been successful • Lack of a universally accepted definition of 'diaspora' • Possible lack of alignment between the top-down approach of the national policy makers defining needs and a bottom-up approach • Too strong a focus on policy making rather than implementation • Duplication of activities and concern about sharing too much information online • Lack of realistic expectations of when diaspora support from abroad can really have an effect on a national policy initiative • Low priority for Ministries compared to EU membership etc.	• Diaspora Relations Bureau and its existing indicators • University Rectors + University strategic development plans • Alumni association at the universities • Think tanks and governments initiations working on diaspora engagement plans and policies • Chamber of Commerce • MER and ME • Examples of specific diaspora policy interventions that have worked abroad and fit closely to a well identified need

Initial Direction (Near-Term Objectives 1-2 years)
Formulation of clear Ministerial statements and associated (small) policy actions based on an improved understanding of Moldovan needs and diaspora profiles. **Action Plan** 1. Undertake a bottom-up Needs Analysis involving PROs and other stakeholders and ensure that this is linked to their strategic plans. 2. Agree on the target group (i.e. define 'diaspora'), and undertake a strong mapping to identify profiles, potential contributions, and optimum methods of engagement. 3. Relevant Ministries to formulate a clear statement of their desire for and purpose in engaging with the diaspora. 4. Each Ministry to translate their purpose into feasible policy actions. 5. Each Ministry to set targets and relevant KPIs. 6. DRB to monitor the KIPs as part of its indicator set.

SG8: Diaspora Science Group (DSG) established

I4SDR Recommendation 6.4.1: Establish the DSG under the auspices of the DRB and with support from consulates abroad, to streamline scientific collaboration

KPIs

- Number of meetings
- Number of members
- Number of distinct activities taking place

Background to the action

Establishing a sound mechanism for systemic and long-term engagement of the diaspora would open new innovative opportunities for Moldova. However, as the present linkages between networks in Moldova and those abroad are frequently based on personal connections and rely mostly on ad hoc engagement opportunities, a more focused effort is needed to ensure their sustainability and realise their full potential.

A dedicated body, such as a Diaspora Science Group (DSG), could coordinate engagement and play a leading role in the promotion and fostering of scientific cooperation between Moldovans abroad and scientists, researchers and affiliated groups in the country. The mechanism would also assist Moldovan scientists based at home or abroad to promote their findings throughout the academic world. The DSG would be created under the auspices of the DRB, but with significant autonomy that would grow as the organization matures, returns positive results and secures various third-party funding.

A secondary goal might be to offer an advisory group to the Moldovan Government. To increase the impact of such a group, non-science actors and social scientists could be included. One approach could be to join diaspora groups with other sectoral groups outside of science and the Moldovan Government. (This might necessitate a change of name for the group, to reflect that it is not exclusively limited to the scientific community). If the group is to advise on policy, it might be necessary to involve national members who could offer feedback on suggestions from those abroad.

In both cases, the advisory group should be autonomous and clearly independent from government and public sector groups, and funded in a sustainable way.

Hazards and barriers

Identified though focus groups/ stakeholder consultation:

- Lack of hard data on the diaspora
- The potential size of such a group and associated coordination and communication
- Lack of capacity at the DRB to manage such a (large) group
- Lack of the holistic, long-term approach necessary to ensure the initiative does not fade away
- Burn-out by diaspora members who have engaged and given their time and energy in the past

Tools and alliances

Identified though focus groups/ stakeholder consultation:

- Current initiatives and pilots at the DRB could facilitate the creation of the group
- Organizations and groups who have prior experience of setting up and running such groups and who could be engaged to manage it for several years, including hometown associations
- Established Moldovan diaspora groups abroad (e.g. NGOs) who could take on a revolving leadership role or work together to help direct the activity
- Small pilot actions that would help to establish the operating model and could be scaled up
- Existing EU diaspora networks and effective practices

- Stimulating mechanisms that could engage local stakeholders with diaspora, e.g. paid sabbatical for academic staff, short term opportunities abroad for graduate students or call for research proposals engaging local academic institutions as well as industrial partners. The advantage of these types of potential calls over the external ones, such as Horizon Europe, is that these can be tailored to the particular goals and needs of local stakeholders.

Initial direction

Scope the action including a clear funding mechanism

Task owner

To be determined

Proposed action plan

1. Agreement on the scope and purpose of the DSG

As a first step, there needs to be an agreement on the purpose and scope of the DSG. Depending on the outcome (e.g. if it has a policy advisory role and involves members from beyond the scientific community), there may be a need to change the proposed name.

Outcome: Purpose and scope agreed and reflected in the name.

2. Formation of a small founding team

The founding team should have critical mass but be small enough to be agile and responsive. Its role will be to develop a viable operating model for the DSG and identify a funding mechanism that makes it sustainable.

Proposed members of the founding group may include the DRB, MER, alumni associations at universities, the Ministry of Foreign Affairs, and several high-profile diaspora individuals.

Outcome: Founding team formed and funding mechanism confirmed.

3. Propose regular and ad-hoc methods of engagement.

This action will be linked closely with the proposed operating and funding model and must also reflect the purpose and scope.

A DSG that is not involved in advisory actions could set up special interest group, for example linked to academic disciplines such as economist groups or STEM groups. The individual groups would define how they would make contact with groups abroad and how they might meet, e.g. via an annual conference or symposium that unites the full diaspora but leaves scope for smaller meetings by the individual groups.

Outcome: Type, frequency and methods of meetings agreed.

4. Ensure that the Group has a solid financial basis for long term operations

A viable long-term funding model will be critical. Setting up the core team will require some level of funding, but it is important that a long view is taken to ensure that activities do not come to a halt after one or two years. It may be helpful for the core team to investigate how other similar groups are funded, for example with core government funding and/or via membership fees. It will be important to remember that members will be making intangible investments and this will be critical to encourage alongside the funding.

Outcome: Viable long term financial model proposed.

5. Set up KPIs for the DSG.

KPIs should be approached with care. Seeing tangible results from such an initiative can take several years of patient investment. Output indicators may be useful in the early days to monitor activity that captures human interactions. Indicators of results and impact may be introduced after eight to ten years and should not predominate in the early stages. Setting up feedback loops will also be an important part of the monitoring and evaluation process.

Milestones

- Purpose and scope confirmed
- Founding group established
- Business plan including funding model developed

Summary Roadmap SG8: Diaspora Science Group (DSG) established and functioning well

Destination (Strategic Goals – 3- 5 year timeframe)

SG8 Diaspora Science Group (DSG) established and functioning well

- KPIs:
- Number of meetings
- Number of members
- Number of distinct activities taking place

Barriers and hazards (Ecosystem + Environment)

- Lack of hard data on the diaspora
- The potential size and diversity of such a group and associated coordination and communication
- Lack of capacity at the DRB to manage such a (large) group
- Lack of necessary holistic, long-term approach to ensure the initiative does not fade away
- Burn-out by diaspora who have given their time and energy in the past and will not be interested to join
- Lack of volunteers, excessive administration, insufficient renumeration

Tools and alliances (Ecosystem + Environment)

- Current initiatives and pilots at the DBR could facilitate the creation of the group
- Organizations and groups who have prior experience of setting up and running such groups and who could be engaged to manage it for several years, including hometown associations
- Established Moldovan diaspora groups abroad, e.g. NGOs, who could take on a revolving coordination/leadership role
- Small pilot actions that would help to establish the operating model and could be scaled up.
- Existing EU diaspora networks and effective practices.

Initial Direction (Near-Term Objectives 1-2 years)

Scope the Diaspora Science Group, including identification of a viable underlying business model

Action Plan

1. Agreement on scope and purpose
2. Formation of a small founding team
3. Proposed regular and ad-hoc methods of engagement
4. Ensure that the Group has a solid financial basis for long-term operations (underlying business model)
5. Agree on meaningful indicators to capture activity and measure results and impact

SG9: Diaspora engaged at various stages of the innovation policy cycles, including at the local level

I4SDR Recommendation 6.5.4: Enhance and maintain trust in diaspora policy development through systematic engagement with diaspora members, including clear and transparent policy mechanisms and implementation tools

KPIs

Under discussion.

Background to the action

Trust is an important prerequisite for engagement in any government-led initiative. Trust in the institutions and a connectedness to the homeland is needed to effectively engage any diaspora. Fostering these qualities requires both a strategic vision and the concrete means to do so.

A lack of trust between highly-skilled diaspora members and the public sector institutions of the home country was one of the central explanatory variables identified for Moldova's wavering connection with its diaspora, and is seen as presenting a significant constraint for diaspora engagement. There is a clear need to elaborate policies to maintain contact and enhance trust while strategically engaging with Moldovans living abroad to benefit the homeland. To achieve this goal, it is recommended that Moldova develop a diaspora strategy, adopted in consensus with diaspora members, along with an action plan that is consistent with national development and innovation policy priorities. This should send a clear signal about Moldova's pragmatic intentions in engaging with its diaspora and pave the way for improved interactions.

The strategy should focus on how Moldova can broadcast a clear and consistent message to those living abroad about activities taking place at home, in order to build and strengthen their trust. This can be done via multiple channels and can include local news and activities, below the level of the DSG exchanges. The critical factor is consistency.

Hazards and barriers

Identified through focus groups/stakeholder consultations:

- Lack of engagement from local groups in the development and implementation of a strategy
- Lack of consensus on the best approach
- Failure to maintain the approach over a period of time
- Lack of local digitised data for monitoring and evaluation, which lowers transparency and accountability on the use of local resources and creates suspicions and scepticism amongst diaspora members
- Changes at local level cause problems in consistency
- Lack of infrastructure for engagement
- Too much involvement in "tree planting" and insufficient attempts to build a community around an idea
- Lack of trust and an unwillingness to engage due to perception of high levels of corruption at state and academic institutions

Tools and alliances

Identified through focus groups/stakeholder consultation:

- Planned DSG, existing diaspora groups and ongoing activities
- Hometown associations and coordinated national alliance of hometown associations
- Local groups interested in playing a stronger role in promoting a positive image of Moldova abroad
- Inclusion of social entrepreneurship and education
- Inclusion of diaspora in the decision-making process at the local level

- Platforms to facilitate communication between diaspora members and local communities
- International and national-level support mechanisms e.g. Horizon Europe
- Local community development strategies
- Local public authorities
- Livestreaming community discussion sessions
- Use of simpler and more direct language in documents, to facilitate engagement by diaspora members of all backgrounds
- Engagement of local libraries and schools to transform them into local hubs for communicating with diaspora members and sharing investment opportunities

Initial direction

Development of a diaspora strategy, adopted in consensus with diaspora members along with an action plan that is consistent with national development and innovation policy priorities.

Task owner

To be determined

Proposed action plan

1. Establish a small group who will drive the action

This group will be different to the one driving the DSG, although there may be some overlap. It should focus on local news (e.g. from home town associations) rather than specialised academic or professional groups.

2. Agree on the engagement infrastructure

The group should agree on the platforms and methods to be used to disseminate news and events. Low-maintenance methods, such as social media, could be used. The more important issue may be the perceived level of trustworthiness of the platform.

Alongside such social media platforms, news could also be disseminated by the DRB, who could publicise information about engagements taking place through projects.

3. Identify the “innovation” aspect to be reflected in the stories

In the context of this recommendation, “innovation” can be understood as inviting people to be involved in “new” actions. An early focus could be agriculture and IT. In contrast to the DSG, the actions could focus on small projects, for example those coming from students, being rewarded with a small prize or positive promotion.

4. Define KPIs to measure the results of the activity

KPIs for measuring trust need to be very carefully selected. While activity indicators (e.g. number of stories posted) will be useful, there will be a long-term need to identify indicators that suggest that the activity is enhancing trust. This might, for example, be reflected in the number and level of investments being made by diaspora investors into local projects. However, this might also need changes to be made to the overall investment environment, for example via e.g. tax credits.

Milestones

- Founding group established
- Presence established on social media

Summary Roadmap SG9: Diaspora engaged at various stages of the innovation policy cycles, including at the local level

Destination (Strategic Goals – 3- 5 year timeframe)
SG.9 Diaspora engaged at various stages of the innovation policy cycles, including at the local level

Barriers and hazards (Ecosystem + Environment)	Tools and alliances (Ecosystem + Environment)
• Lack of engagement from local groups in the development and implementation of a strategy. • Lack of consensus on the best approach. • Failure to maintain the approach over a period of time. • Lack of local digitised data for M&E which lowers transparency and accountability on the use of local resources and creates suspicions and scepticism amongst diaspora members. • Changes at local level cause problems in consistency (people lost). • Lack of infrastructure for engagement. • Too much involvement in "tree planting" and insufficient attempts to build a community around an idea. • Short term projects that and initiatives, (sponsored by foreign donors and implemented by diaspora), that lack sustainability due to project-based funding.	• Planned DSG, existing diaspora groups • Hometown associations and coordinated national alliance of hometown associations. • Local groups interested in playing a stronger role in promoting a positive image of Moldova abroad • Inclusion of social entrepreneurship and education • Inclusion of diaspora in the decision-making process at local level • Platforms to facilitate communication between diaspora members and local communities • International and national-level support mechanisms e.g. Horizon Europe • Local community development strategies • Local public authorities • Livestreaming community discussion sessions • Use of simpler and more direct language in documents • Engagement of local libraries and schools to transform them into local hubs for communicating with diaspora members and sharing investment opportunities • Sustainable projects and activities, long-term investment in community projects and social entrepreneurship.

Initial Direction (Near-Term Objectives 1-2 years)
Development of a diaspora strategy, adopted in consensus with diaspora members along with an action plan that is consistent with the national development and innovation policy priorities. **Action plan** 1. Establish a small group who will drive the action. 2. Agree on the engagement infrastructure 3. Identify the "innovation" aspect to be reflected in the activities and stories 4. Define KPIs to measure the results of the activity

References

Innovation for Sustainable Development Review of Moldova, UNECE 2022

Available at: https://unece.org/info/publications/pub/364780