TECHNOLOGY TRANSFER IN AZERBAIJAN

2019-2020

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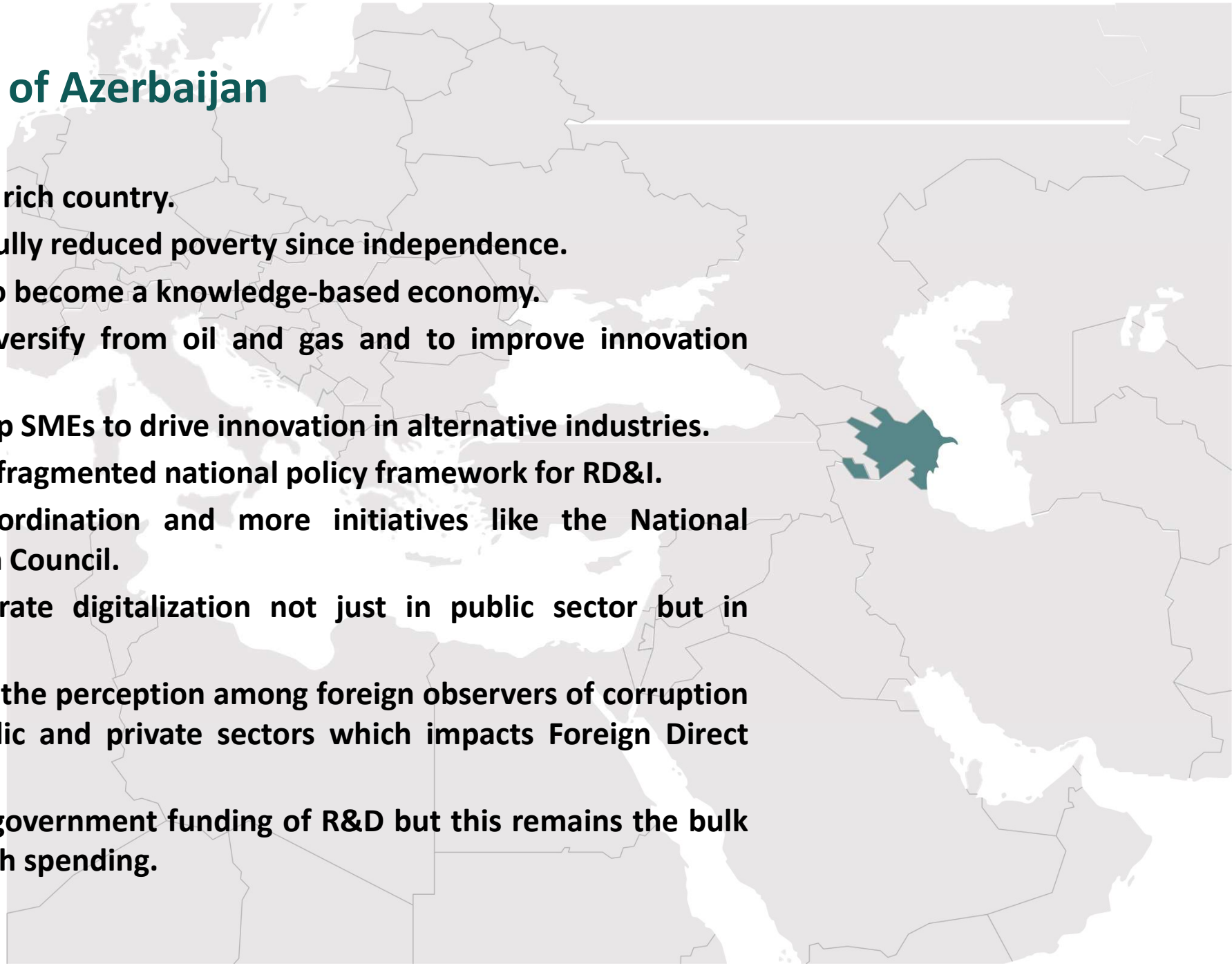
The Republic of Azerbaijan



- Is a resource rich country.
- Has successfully reduced poverty since independence.
- Now seeks to become a knowledge-based economy.
- Needs to diversify from oil and gas and to improve innovation capability.
- Needs to help SMEs to drive innovation in alternative industries.
- Has a highly fragmented national policy framework for RD&I.
- Requires coordination and more initiatives like the National Coordination Council.
- Must accelerate digitalization not just in public sector but in industry.
- Suffers from the perception among foreign observers of corruption in both public and private sectors which impacts Foreign Direct Investment.
- Has limited government funding of R&D but this remains the bulk of all research spending.

Universities and research organisations

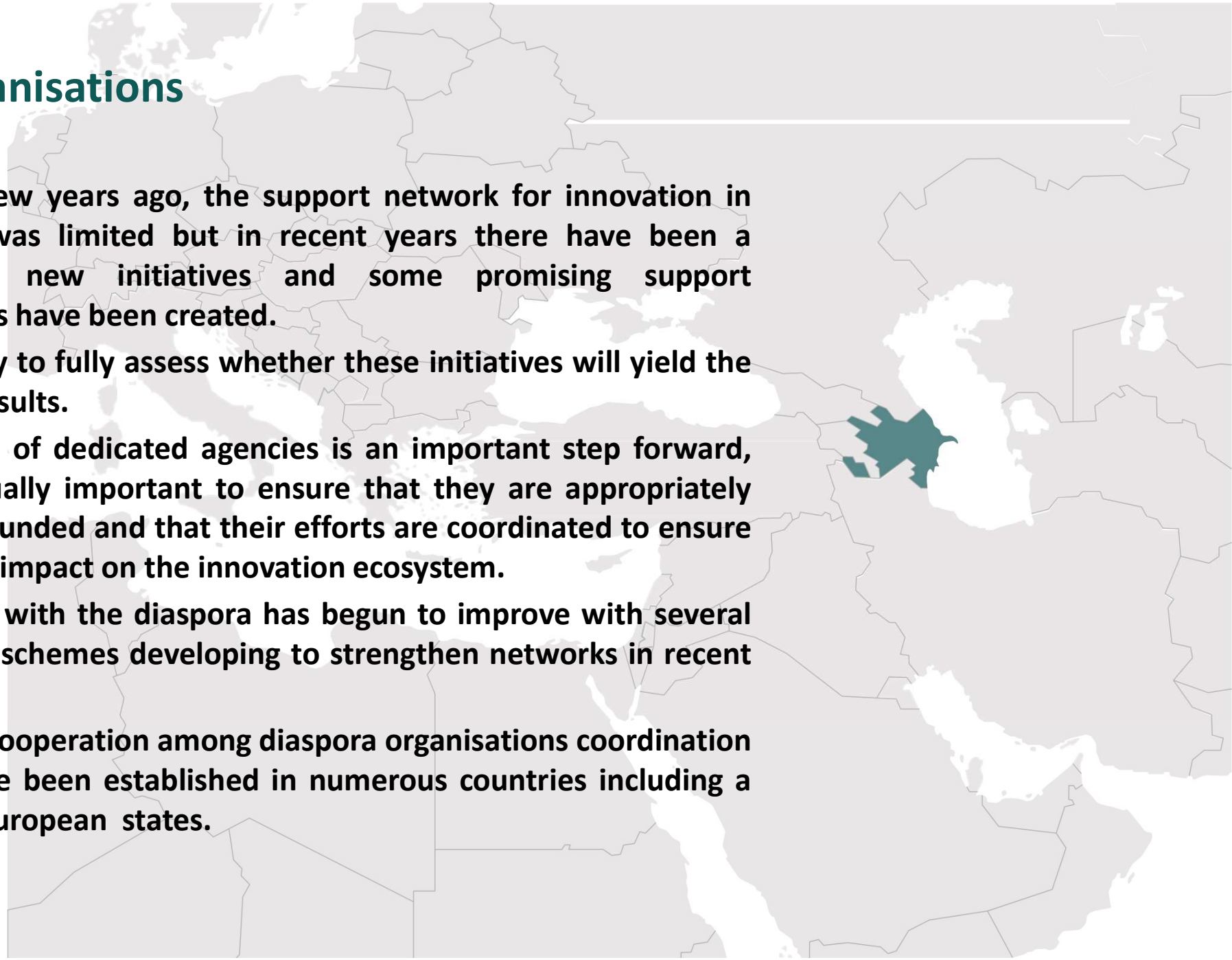
- High number of universities and research organisations but quantity and quality of the output remains low.
- Insufficient participation in international collaborations.
- The National Strategy for the Development of Education (2015-2025) recognised the need to invest in STEM education but more needs to be done.
- The education system shows little sign of alignment with the needs of the business community.
- Businesses appear to have trouble finding the talent they need.
- In education, as in research, government funding is limited.
- There are limited international mobility programmes and few examples of bilateral cooperation between specific Azerbaijani Higher Education Institutions (HEIs) and international institutions.
- The overwhelming majority of research (approximately 86%) is conducted by the government with only 9% conducted by HEIs and very little in the private sector (UNECE, 2020).

Industry

- Most data available suggests that innovation levels are very low.
- Private sector involvement in R&D remains very weak.
- Contributory factors include funding difficulties, and lack of awareness in the business community of the research infrastructures and competences available within research institutes.
- One problem industry faces is the attraction of skilled workers.
- HEIs have not yet been able to fully adapt their offering to meet the needs of industry, both in terms of supplying graduates with the right skill sets and in terms of opportunities for partnerships with industry.
- Start-up development in Azerbaijan is growing but from a very small base and remains limited. There are promising initiatives in this area, but more time is needed to assess their performance.

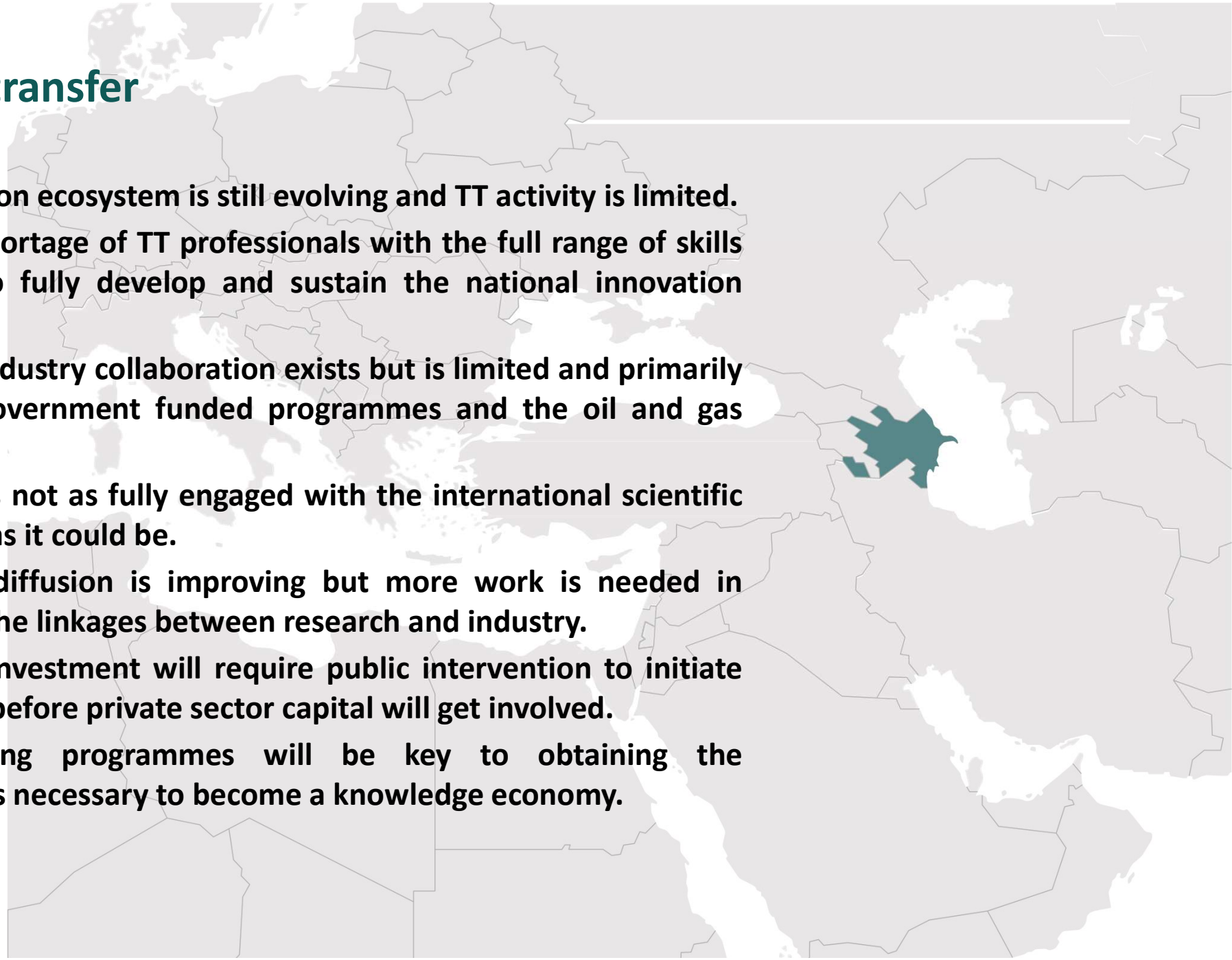
Support organisations

- **Up until a few years ago, the support network for innovation in Azerbaijan was limited but in recent years there have been a number of new initiatives and some promising support organisations have been created.**
- **It is too early to fully assess whether these initiatives will yield the hoped-for results.**
- **The creation of dedicated agencies is an important step forward, but it is equally important to ensure that they are appropriately staffed and funded and that their efforts are coordinated to ensure an optimum impact on the innovation ecosystem.**
- **Engagement with the diaspora has begun to improve with several government schemes developing to strengthen networks in recent years.**
- **To improve cooperation among diaspora organisations coordination councils have been established in numerous countries including a number of European states.**



Technology transfer

- The innovation ecosystem is still evolving and TT activity is limited.
- There is a shortage of TT professionals with the full range of skills necessary to fully develop and sustain the national innovation ecosystem.
- University-industry collaboration exists but is limited and primarily driven by government funded programmes and the oil and gas sector.
- Azerbaijan is not as fully engaged with the international scientific community as it could be.
- Knowledge diffusion is improving but more work is needed in developing the linkages between research and industry.
- Early-stage investment will require public intervention to initiate the process before private sector capital will get involved.
- Skills building programmes will be key to obtaining the competences necessary to become a knowledge economy.

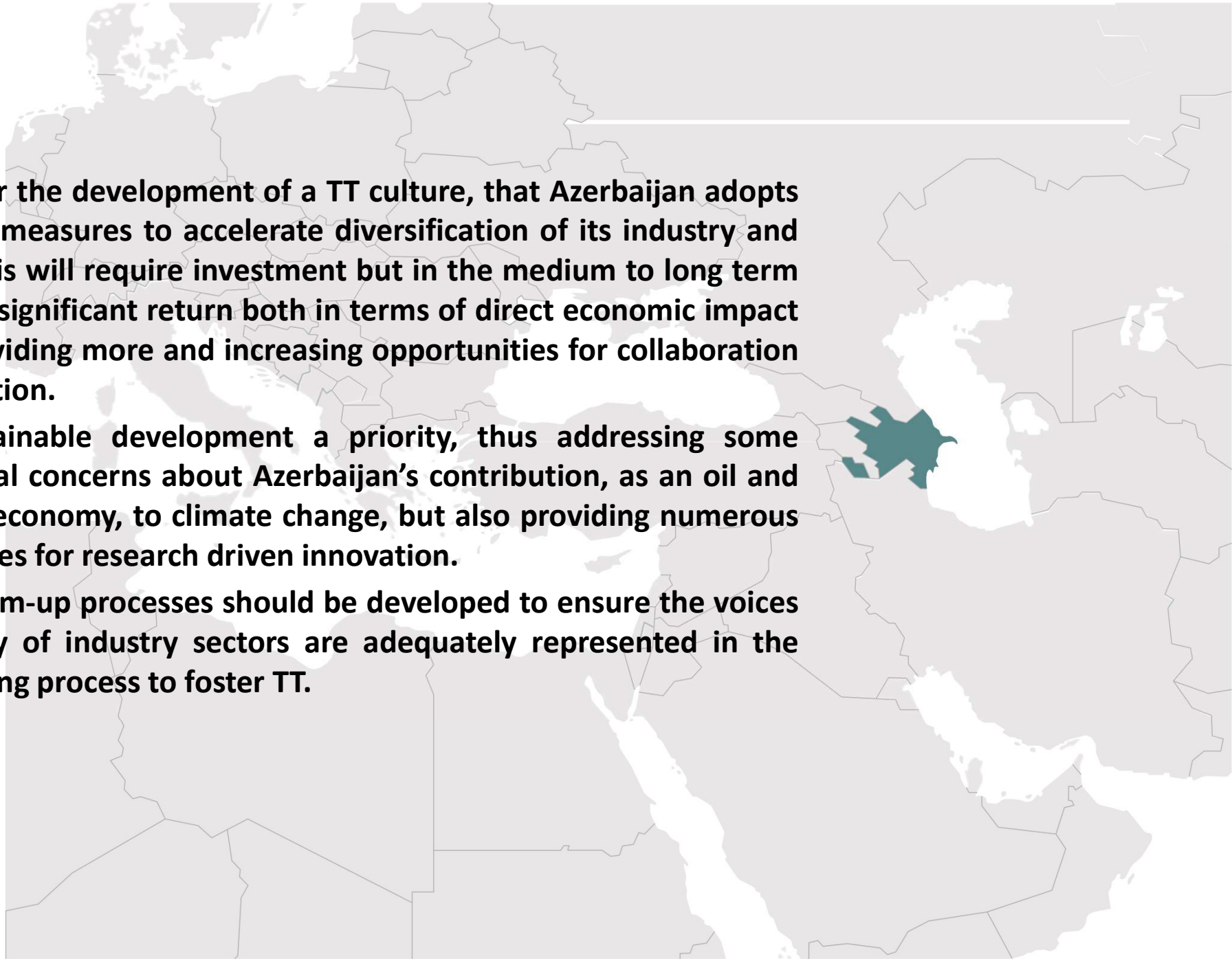


Recommendations

- Ecosystem
- Innovation Policy
- R&D infrastructure
- SMEs and start-ups
- Technology Transfer
- Human resources/competences
- Funding
- Monitoring and KPIs

Ecosystem

- **It is vital for the development of a TT culture, that Azerbaijan adopts pro- active measures to accelerate diversification of its industry and exports. This will require investment but in the medium to long term will yield a significant return both in terms of direct economic impact and by providing more and increasing opportunities for collaboration and innovation.**
- **Make sustainable development a priority, thus addressing some international concerns about Azerbaijan's contribution, as an oil and gas driven economy, to climate change, but also providing numerous opportunities for research driven innovation.**
- **More bottom-up processes should be developed to ensure the voices of a variety of industry sectors are adequately represented in the policy making process to foster TT.**



Innovation policy

- Improve policy setting and strategic planning.
- Coordinate public procurement of innovation.
- A centralised coordination of science and innovation policy.
- Ensure Coordination Council for Science and Innovation Policy becomes fully operational.
- Funding is a significant issue for Research Development and Innovation
- Priority setting and targeted funding will be essential.
- Foresight exercises and processes like Smart Specialisation (S3) can help.
- Form stronger international partnerships with foreign research organisations and HEIs.
- Increase international collaborations – help institutions with project presentation.
- Continue to develop initiatives to involve the diaspora in developing innovation ecosystem.
- Eliminate overlaps and duplication in service provision from incubators, accelerators and high technology parks to streamline the system and provide end-to-end support.
- Increase public awareness nationally and internationally of the government's commitment to improving the innovation ecosystem of Azerbaijan

R&D Infrastructure

- **Create a small number of Centres of Excellence where research infrastructures can be concentrated, and which reflect the strategic priorities of the country and the sectors in which it wishes to stimulate diversification and innovation. These centres should be few and highly focused to ensure adequate resources are made available and to avoid dispersion and dilution of effort.**

- **Make better use of the extensive re- search infrastructure already available and guarantee access for industry. Use international best practices as models to develop open access approaches to stimulate industry use of public sector research infrastructure and capabilities.**

SMEs and start-ups

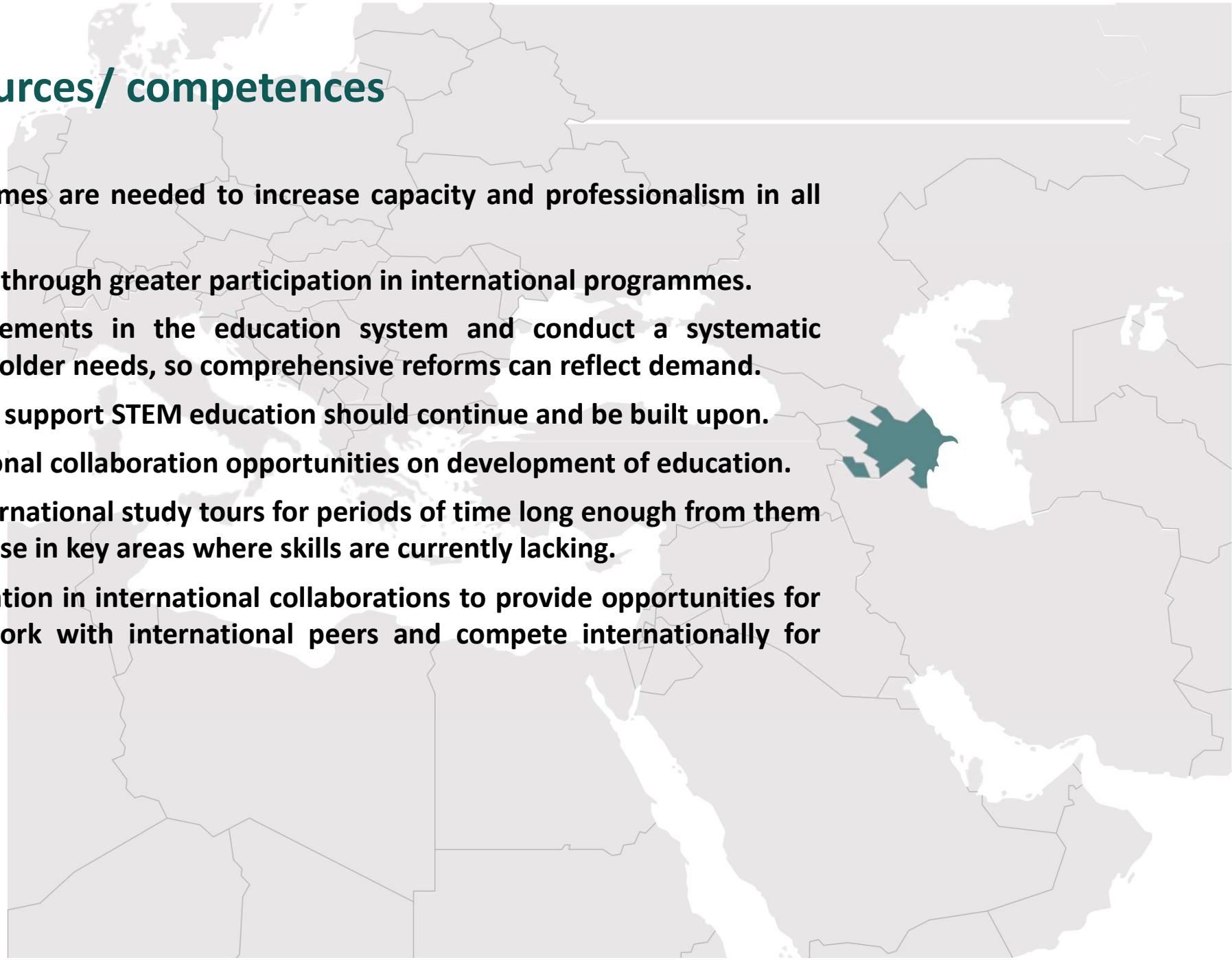
- **Continue on the path already taken of addressing governance issues to enable businesses, in particular start-ups, to be established and to scale up with the minimum of red tape and bureaucracy.**
- **A clear definition of “start-up” must be adopted across the board to ensure coherent policymaking.**
- **Improve and accelerate the adoption of digital technologies across the board.**

Technology Transfer

- Technology commercialisation needs to be developed as a professional skill set
- Development of IP from residents should be encouraged.
- Technology Foresight, Scenario Planning and Strategic Technology Roadmaps.
- Specific capacity building in all areas of TT across all existing and emerging TT actors.
- Investment is needed in training and partnering with international.
- Technology Readiness Level (TRL) assessment processes should be developed.
- Spin-off programmes should be enhanced to encourage researchers to engage in entrepreneurial activity and commercialisation of their research results.
- Encourage industry-research partnerships across a range of technology areas and industry sectors with particular emphasis on key enabling technology areas of strategic interest.
- Open Innovation approaches should be taught across industry sectors to highlight the benefits
- TT between companies as well as between researchers and industry should be incentivised.
- Patent Libraries and patent information research should be more widely disseminated.
- A clear definition of “start-up” must be adopted across the board to ensure coherent policymaking.
- Improve and accelerate the adoption of digital technologies across the board.

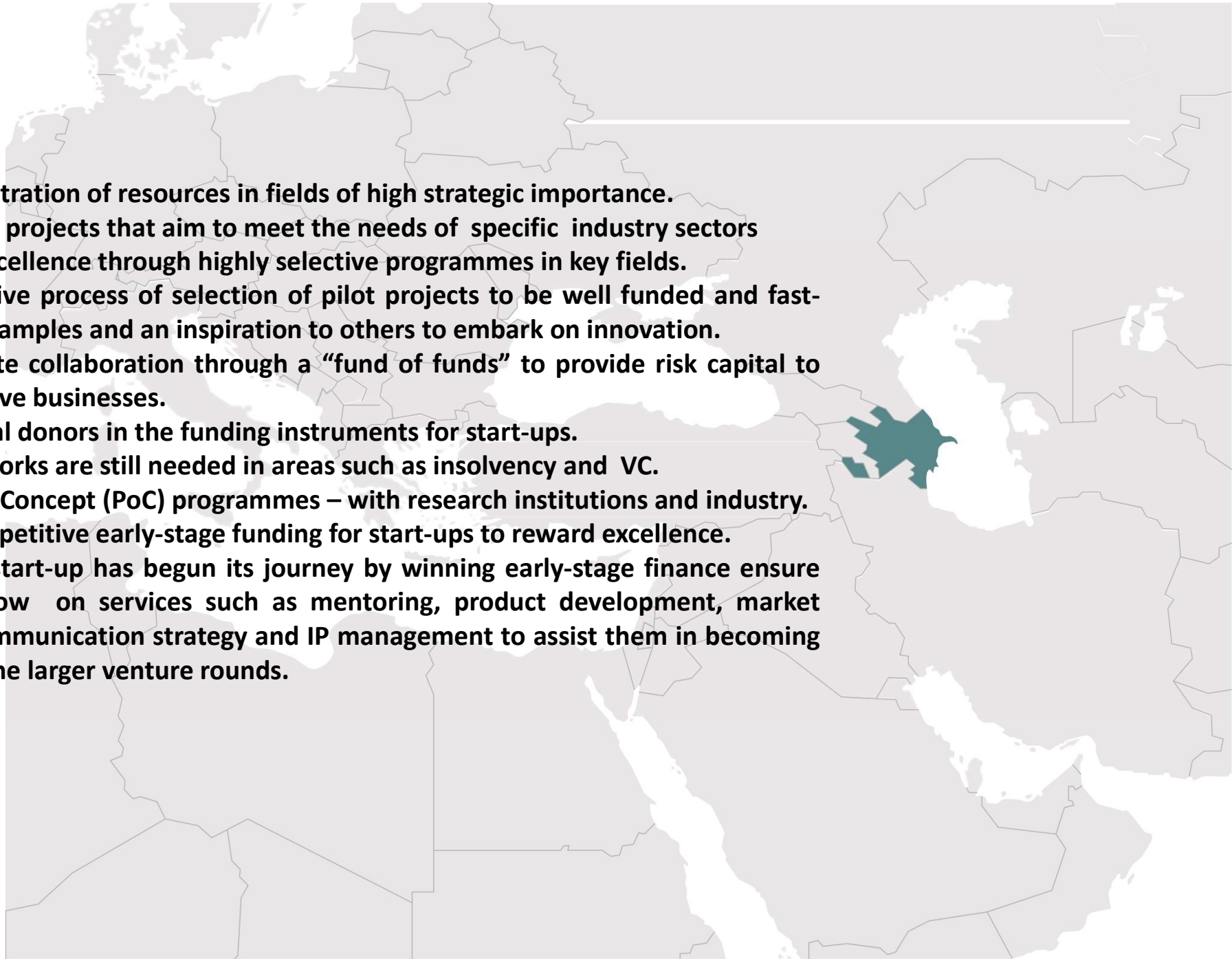
Human resources/ competences

- **Training programmes are needed to increase capacity and professionalism in all sectors.**
- **Increase mobility through greater participation in international programmes.**
- **Continue improvements in the education system and conduct a systematic analysis of stakeholder needs, so comprehensive reforms can reflect demand.**
- **Existing efforts to support STEM education should continue and be built upon.**
- **Explore international collaboration opportunities on development of education.**
- **Send staff on international study tours for periods of time long enough from them to acquire expertise in key areas where skills are currently lacking.**
- **Increase participation in international collaborations to provide opportunities for researchers to work with international peers and compete internationally for funding.**



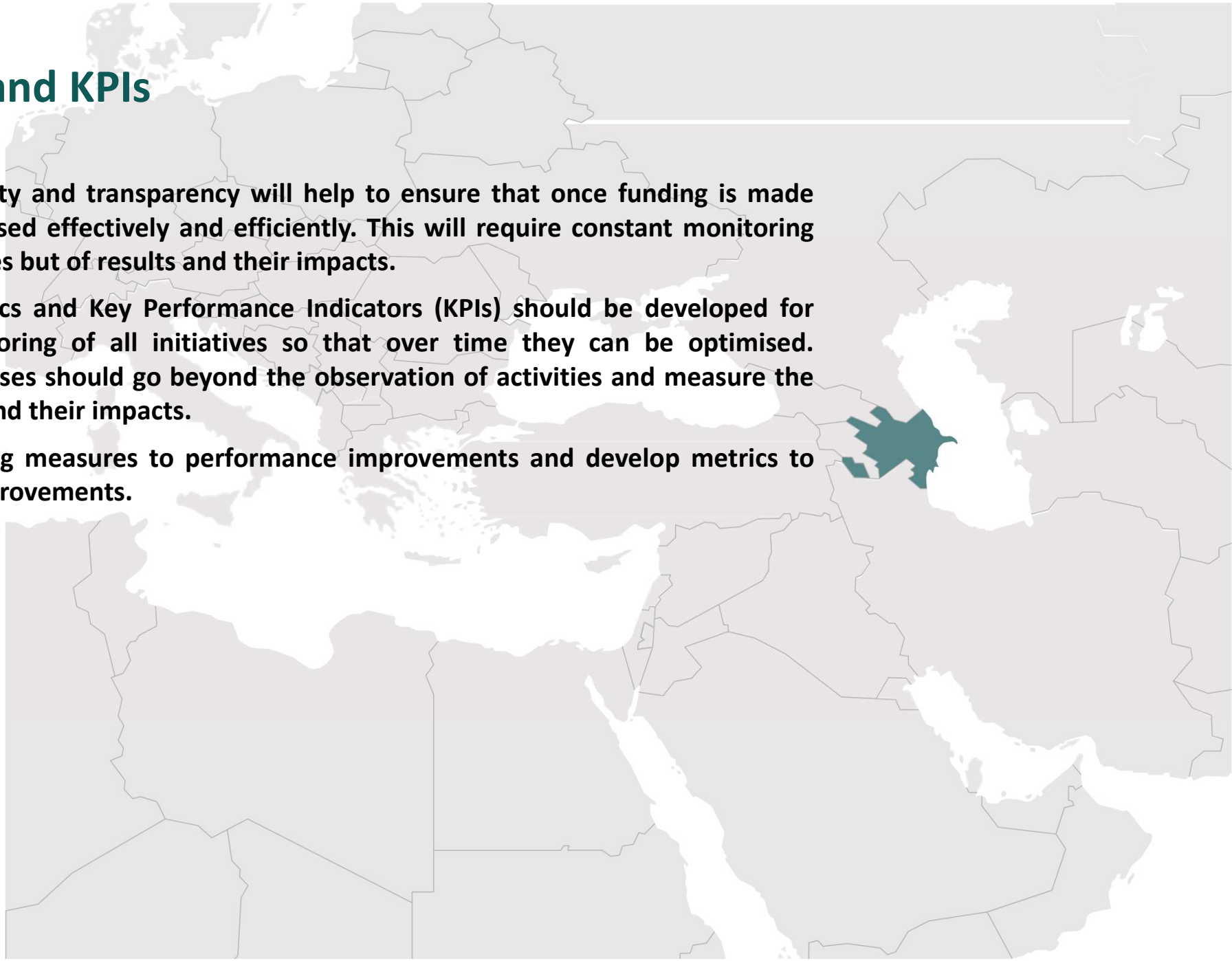
Funding

- Increase the concentration of resources in fields of high strategic importance.
- Co-finance research projects that aim to meet the needs of specific industry sectors
- Reward research excellence through highly selective programmes in key fields.
- Introduce competitive process of selection of pilot projects to be well funded and fast-tracked to create examples and an inspiration to others to embark on innovation.
- Enable public-private collaboration through a “fund of funds” to provide risk capital to early-stage innovative businesses.
- Involve international donors in the funding instruments for start-ups.
- Better legal frameworks are still needed in areas such as insolvency and VC.
- Co-finance Proof of Concept (PoC) programmes – with research institutions and industry.
- Increase highly competitive early-stage funding for start-ups to reward excellence.
- Once an excellent start-up has begun its journey by winning early-stage finance ensure that there are follow on services such as mentoring, product development, market assessment and communication strategy and IP management to assist them in becoming investor ready for the larger venture rounds.



Monitoring and KPIs

- **More accountability and transparency will help to ensure that once funding is made available it is utilised effectively and efficiently. This will require constant monitoring not just of activities but of results and their impacts.**
- **Appropriate metrics and Key Performance Indicators (KPIs) should be developed for continuous monitoring of all initiatives so that over time they can be optimised. Monitoring processes should go beyond the observation of activities and measure the results obtained and their impacts.**
- **Link future funding measures to performance improvements and develop metrics to monitor these improvements.**



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Thank you for your attention!