5. Industry-Science linkages and collaboration in the innovation process

The government as facilitator of science-industry collaboration

Policies

- **Industrial policy**
  - export led (2011)

- **Innovation policy**
  - concept paper (2011)
  - cooperation project

- **Science policy**
  - Strategy of Science Development (2010)
  - Action Plan (2011)
Legal regulation framing interactions

- Law on Scientific and Technological Activity (December 2000)
- Law on State Support to Innovation Activity (May 2006)
- Law on the National Academy of Sciences of Armenia (‘11)
Mechanisms for interaction between public research institutions and enterprises

- Main tools
- Other tools for supporting ISLs
  - tax incentives
  - innovative public procurement
  - office in Silicon Valley
  - free economic zones

- Grand projects:
  - CANDLE project
  - Center for Radiation Medicine
  - Armenian Centre of Excellence in Oncology
5.3 ISL Implementation

Industry (size, owners, sectoral structure)
Scientific institutions as potential collaborators

- Think tank / Do tank universities
- NAS Institutes
- Other Institutes

IPR Management in Scientific Organisation
## Type, function of isolated (Archipelagos) collaborations

<table>
<thead>
<tr>
<th>Type</th>
<th>Function</th>
<th>Armenian examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ad hoc consultation of firm at universities</td>
<td>Information gathering</td>
<td>In initial phase: some conferences have been organised for building linkages typically in specific sectors (e.g. ICT, medical)</td>
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<td>Regular discussions between U/I on various issues</td>
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<td>Purchase of university research results on ad hoc basis</td>
<td>Knowledge dissemination</td>
<td>YSU / Faculty of Radiophysics / - Synopsis lecturers trained the staff to disseminate best practice</td>
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<td>Lectures of firm employees held at universities</td>
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## Type, function of far distance and Arm's Length Cooperations

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<tr>
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</thead>
<tbody>
<tr>
<td>Employing faculty members as regular consultants</td>
<td>Information gathering</td>
<td>Joint working as professors at university and engineers at firms (YSMU, YSEU, YSU and so on)</td>
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<tr>
<td>Coaching of firm employees by U researchers</td>
<td>Knowledge dissemination</td>
<td>YSU / Faculty of Radiophysics / - Synopsis PhD students conducting research</td>
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<td>Training of firm employees by professors</td>
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<td>Joint supervision of theses by U-I members</td>
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<td>Joint publications by professors and firm employees</td>
<td>R&amp;D</td>
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<td>Joint IPRs by professors and firm employees</td>
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Type, function of Triple Helix (Horizontal) collaborations

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<th>Function</th>
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<td>Formal R&amp;D co-operations - joint R&amp;D</td>
<td>R&amp;D</td>
<td>YSMU / Pharmaceutical Faculty)</td>
</tr>
<tr>
<td>Regular acquisition of university research</td>
<td>R&amp;D</td>
<td>- Dental research firm in Gami</td>
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<tr>
<td>Formal R&amp;D co-operation - outsourcing</td>
<td>R&amp;D infrastructure</td>
<td>- Arpimed pharmaceuticals</td>
</tr>
<tr>
<td>Access to special equipment of I/U</td>
<td>R&amp;D infrastructure</td>
<td>YSEU – NIs, IBM, Nokia softwares</td>
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<tr>
<td>Investment in university’s facilities</td>
<td>Knowledge dissemination Information gathering</td>
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Recommendations

1. Innovation policy
   - should emphasise the importance of ISL
   - introduce relevant programmes for improvement situation.

Public initiatives could include:
- Developing instruments target ISL
- Encouraging HE graduates to establish start-ups
- Co-designing FDI & STI policy to attract more foreign investors employing Armenian scientific assets;
- Promoting cross-border IS linkages
2. Substantial public support is required to promote ISL at the initial development stages, because initial public funding is necessary before technology transfer activities can become profit-making.

In order to encourage the development of the necessary capacities and facilitate commercialization, the authorities could consider:

- Facilitating the development of TTOs/TTO functions
- Designing a scheme to support patenting to seek international protection and grants to partly cover the associated costs;
- Strengthen the capacity of the IP Agency for broader services to its clients.

3. The authorities should extend the economic autonomy of HEIs and NAS research institutes undertaking the necessary legal reforms while encouraging them to develop internal regulations concerning technology transfer.

The legal reforms could include:

- Harmonising the Law on HEI and the Law on State non-commercial organization in order to remove factors burdening ISL;
- Providing equal opportunities to different organizations to revise their Charters to engage in entrepreneurial activities;
- An appropriate framework for the creation of spin-off companies emerging from research and education organisations;
- Developing guidelines
  - on IP issues to be included in employee contracts
  - on the management of TTOs.

4. Evidence-based policy-making and the development of a strategy for research organisations requires well-developed evaluation initiatives.

The authorities should promote both internal and external evaluation of government agencies and research organisations according to the relevant principles.

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