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Ministry Of Science and Higher Education



Ethiopia's Experiences and Practices in Promoting Sustainable Development by Scientific and Technological Innovations

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Education, Ethiopia**

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Innovation for Sustainable Development Goals

December 12, 2019, Guilin, China





Prime Minister Abiy Ahmed



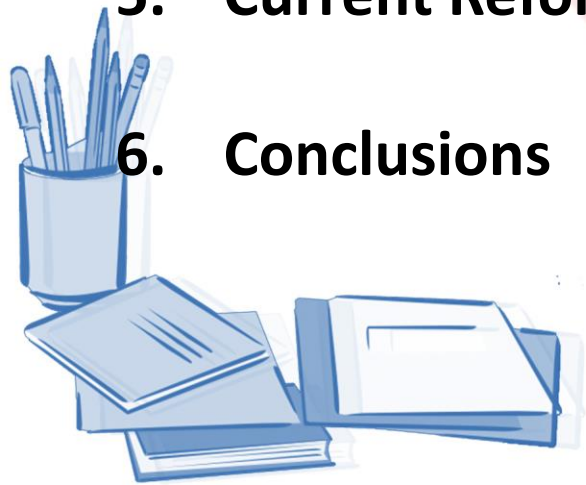
100th Nobel Peace Prize Winner
Dec 10, 2019 Oslo, Norway.





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- 3. Ethiopia's innovation system**
- 4. STI policy**
- 5. Current Reform Activities at MoSHE**
- 6. Conclusions**





Ethiopia



- 3 30' and 14 55' North and 33 to 48 East
- **Old country** with culture and traditions dating back over 3000 years
- **Cradle for human origin**
- **Full name:** Federal Democratic Republic of Ethiopia
- **Economy:** One of fastest growing non-oil economies in Africa; depends heavily on agriculture.
- **Main exports:** **Mainly primary products** (Coffee, hides, oilseeds, beeswax, sugarcane, etc) and recently textile and leather
- **Monetary unit:** 1 Birr = 100 cents (Exchange rate: 1 USD = 30 Birr)
- **GDP per capita:** US \$853 (2018)
- **Capital city:** Addis Ababa
- **Population:** **105 million (2017)**
- **People:** Multi-ethnic (80 ethnic groups)
- **Area:** 1.13 million sq km (437,794 sq miles)
- **Major languages:** Amharic, Oromo, Tigrinya
- **Major religions:** Christianity, Islam (Cross and crescent, example of religious co-existence)
- **Life expectancy:** 62 years (men), 64 years (women)





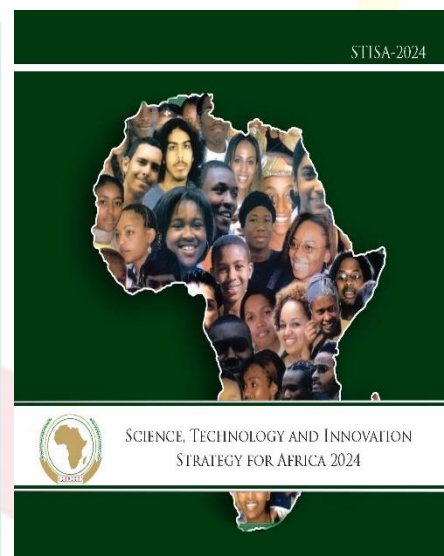
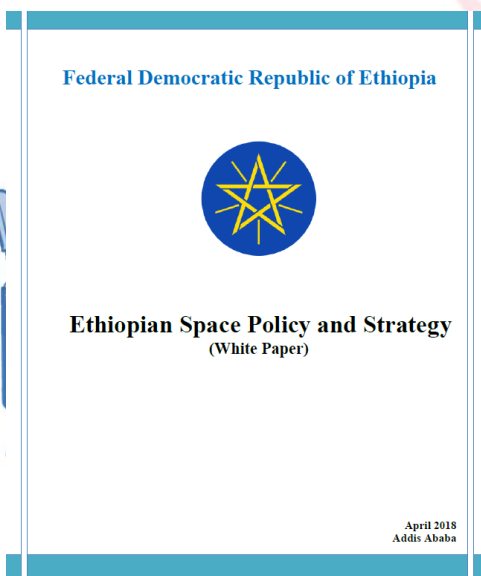
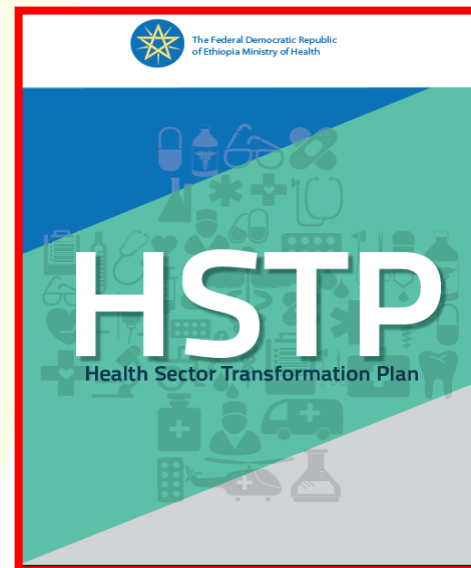
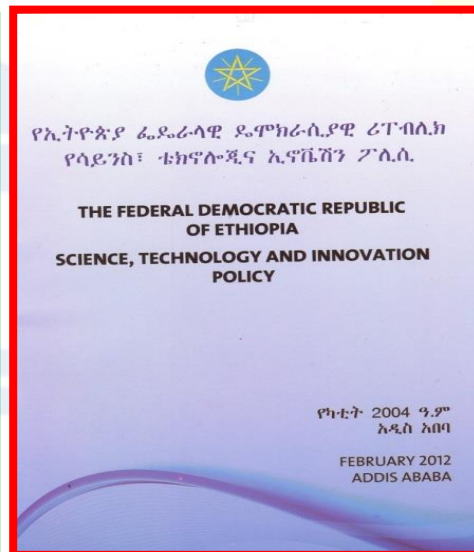
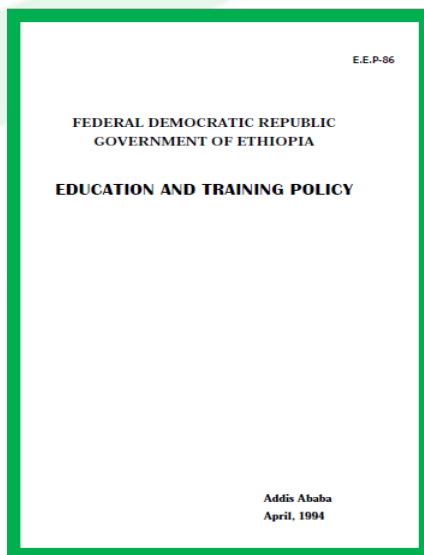
SDGs and GTP

- Ethiopia's Growth and Transformation Plan (GTP) Priorities and the UN Sustainable Development Goals (SDGs) are aligned.
- Coordinated by National Planning and Development Commission.
- Ethiopia was among the 40 member states which conducted the first year voluntary review of performance in 2016.





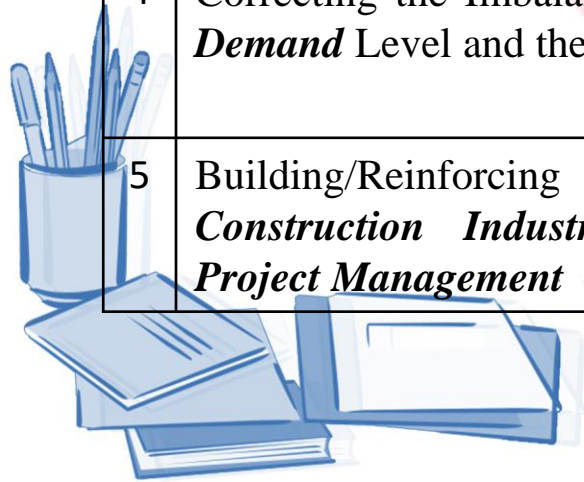
SDGs & Policy Context in Ethiopia





Ethiopia's GTP Focus Areas and SDGs

	National Development Priority Areas in GTP II	Sustainable Development Goals				
1	The Agriculture Sector remains the Source of the rapid Economic growth.	15 አጠቃላይ ምርት ማሳደግ አጠቃላይ ምርት ማሳደግ	13 የአየር ንብረት ጥበቃ የአየር ንብረት ጥበቃ	2 ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ	6 ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ	14 የውሃ ስብዓዊ ጥሬ ጥሬ ጥሬ
2	Expediting transformation of the economic infrastructure by enabling the manufacturing industry grow by leaps and bounds.	9 ኢንዱስትሪ ምርት ማሳደግ ኢንዱስትሪ ምርት ማሳደግ	4 ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ	1 ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ	12 አጠቃላይ ምርት ማሳደግ አጠቃላይ ምርት ማሳደግ	8 ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ
3	Prioritizing Productivity, Quality and Competitiveness by increasing Efficiency in order to reach the Full Production Capacity of the Economy	4 ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ	12 አጠቃላይ ምርት ማሳደግ አጠቃላይ ምርት ማሳደግ	7 አጠቃላይ ምርት ማሳደግ አጠቃላይ ምርት ማሳደግ	8 ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ	9 ኢንዱስትሪ ምርት ማሳደግ ኢንዱስትሪ ምርት ማሳደግ
4	Correcting the Imbalance between the Gross Demand Level and the Gross Supply Level	8 ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ	9 ኢንዱስትሪ ምርት ማሳደግ ኢንዱስትሪ ምርት ማሳደግ	10 አጠቃላይ ምርት ማሳደግ አጠቃላይ ምርት ማሳደግ	12 አጠቃላይ ምርት ማሳደግ አጠቃላይ ምርት ማሳደግ	13 የአየር ንብረት ጥበቃ የአየር ንብረት ጥበቃ
5	Building/Reinforcing capacities in the Construction Industry Development and Project Management	11 አጠቃላይ ምርት ማሳደግ አጠቃላይ ምርት ማሳደግ	9 ኢንዱስትሪ ምርት ማሳደግ ኢንዱስትሪ ምርት ማሳደግ	8 ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ	4 ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ ጥሬ	12 አጠቃላይ ምርት ማሳደግ አጠቃላይ ምርት ማሳደግ



Ethiopia's GTP Focus areas and SDGs

	National Development Priority Areas in GTP II	Sustainable Development Goals				
6	Adopting Urban Administration and Management comparable with the Rapid Urbanization, Industrialization and Structural Changes	11	9	6	13	15
7	According due precedence to transform Domestic Investors	12	9	8	16	11
8	Supporting the Human Resources Development Efforts with Technology	8	4	3	5	10
9	Building Climate Resilient Green Economy	13	15	2	6	9
10	Upholding Developmental Perspectives by eliminating Rent-Seeking Attitudes	16	5	10	8	1



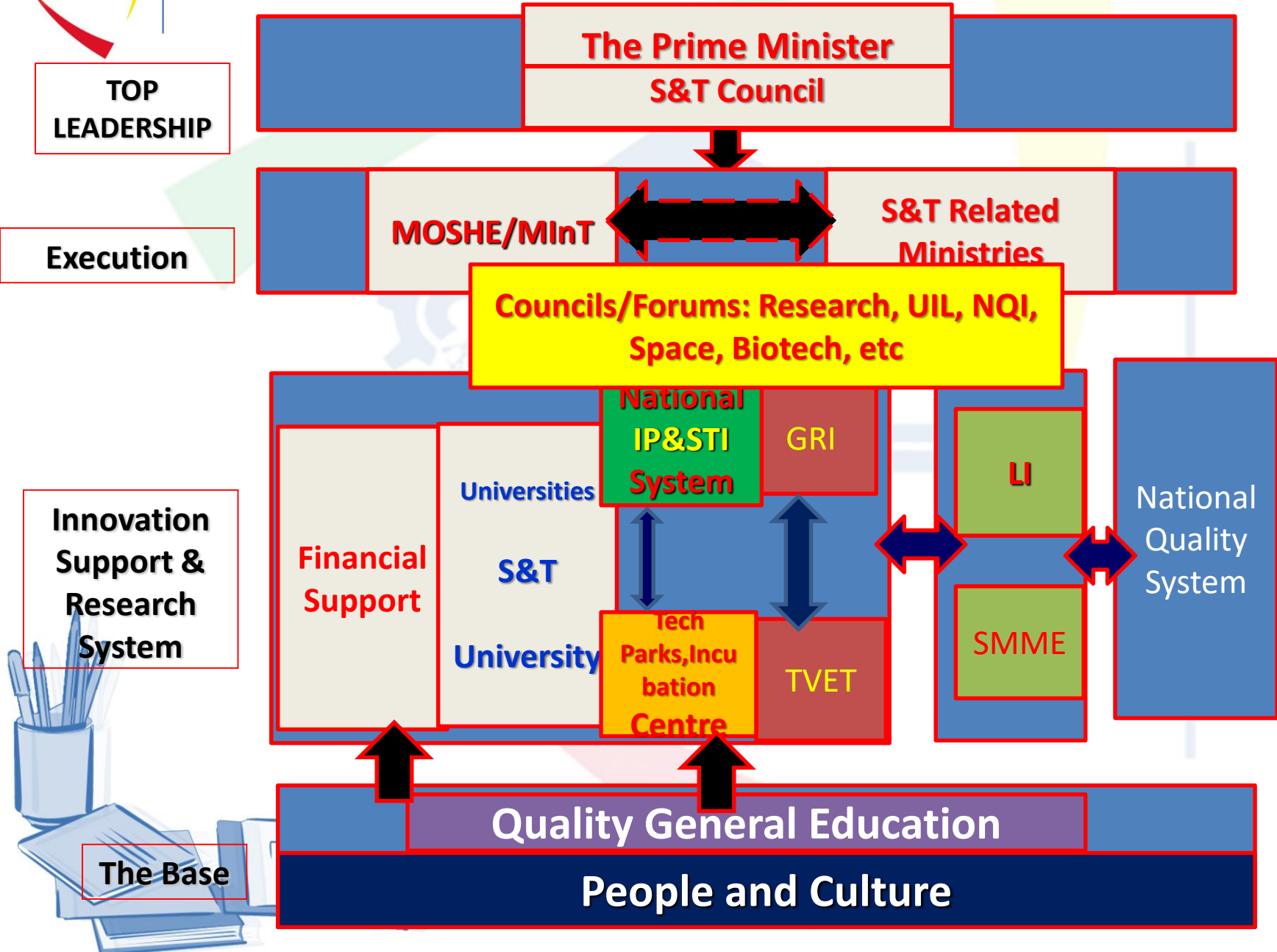


Ethiopia's Innovation System: SDGs and STI Connect





National Innovation System of Ethiopia





Ethiopia's Council of Ministers (n=20): Roles in innovation system and SDGs



Ministry of Science and Higher Education
Ministry of Education
Ministry of Innovation and Technology
Ministry of Peace
Ministry of Defense
Ministry of Foreign Affairs
Ministry of Finance
Ministry of Agriculture
Ministry of Trade and Industry
Ministry of Transport

Ministry of Urban Development and Construction
Ministry of Water, Irrigation and Energy
Ministry of Mines and Petroleum
Ministry of Health
Ministry of Women, Children and Youth
Ministry of Labor and Social Affairs
Ministry of Culture and Tourism
Ministry of Revenue
Attorney General
Plan Commission



Ethiopia's STI Policy Issues and Their Implication for SDGs

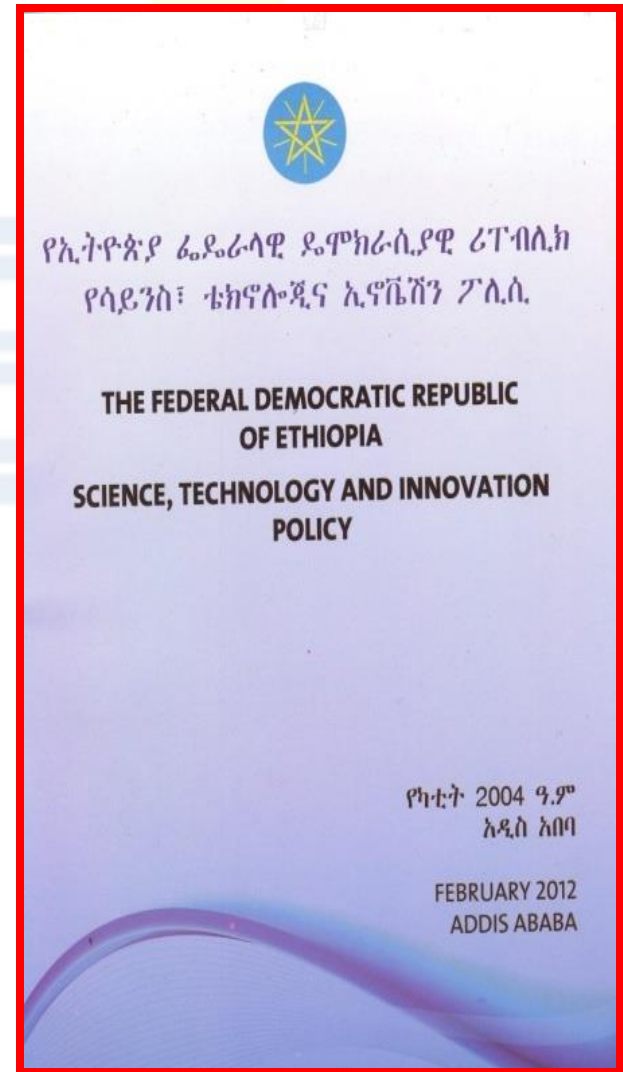




STI Policy of Ethiopia:

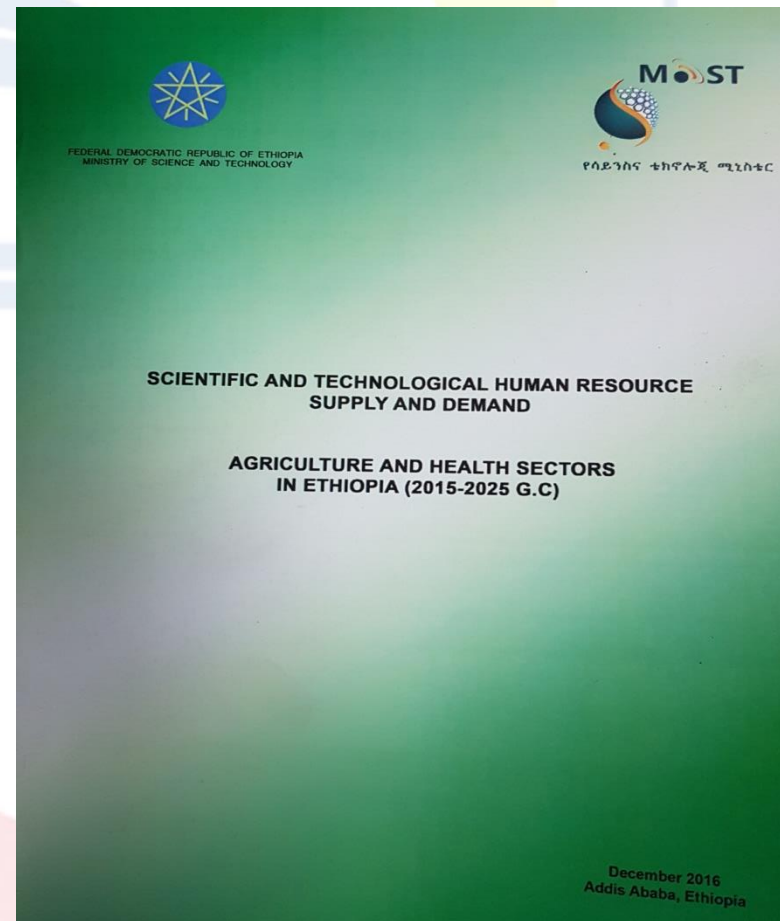
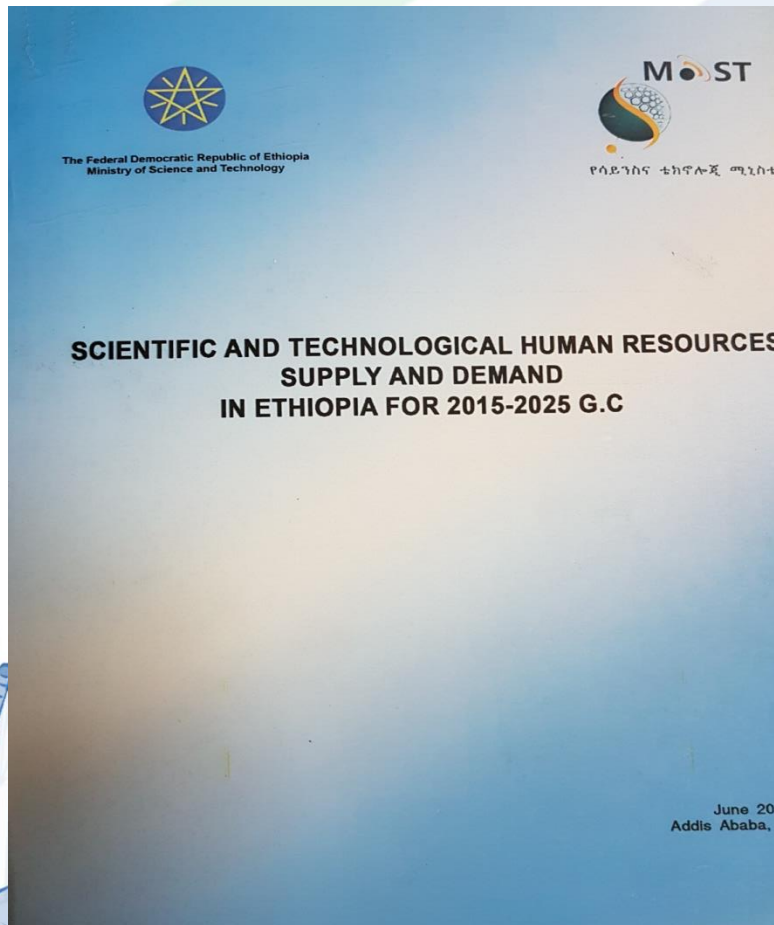
Eleven critical policy issues

1. *Technology Transfer,*
2. *Human resource development,*
3. *Manufacturing and service providing enterprises,*
4. *Research,*
5. *Financing and incentive schemes*
6. *National quality infrastructure development,*
7. *Universities, research institutes, TVET institutions and industries linkage,*
8. *Intellectual property system,*
9. *Science and technology information,*
10. *Environmental development and protection, and*
11. *International cooperation.*



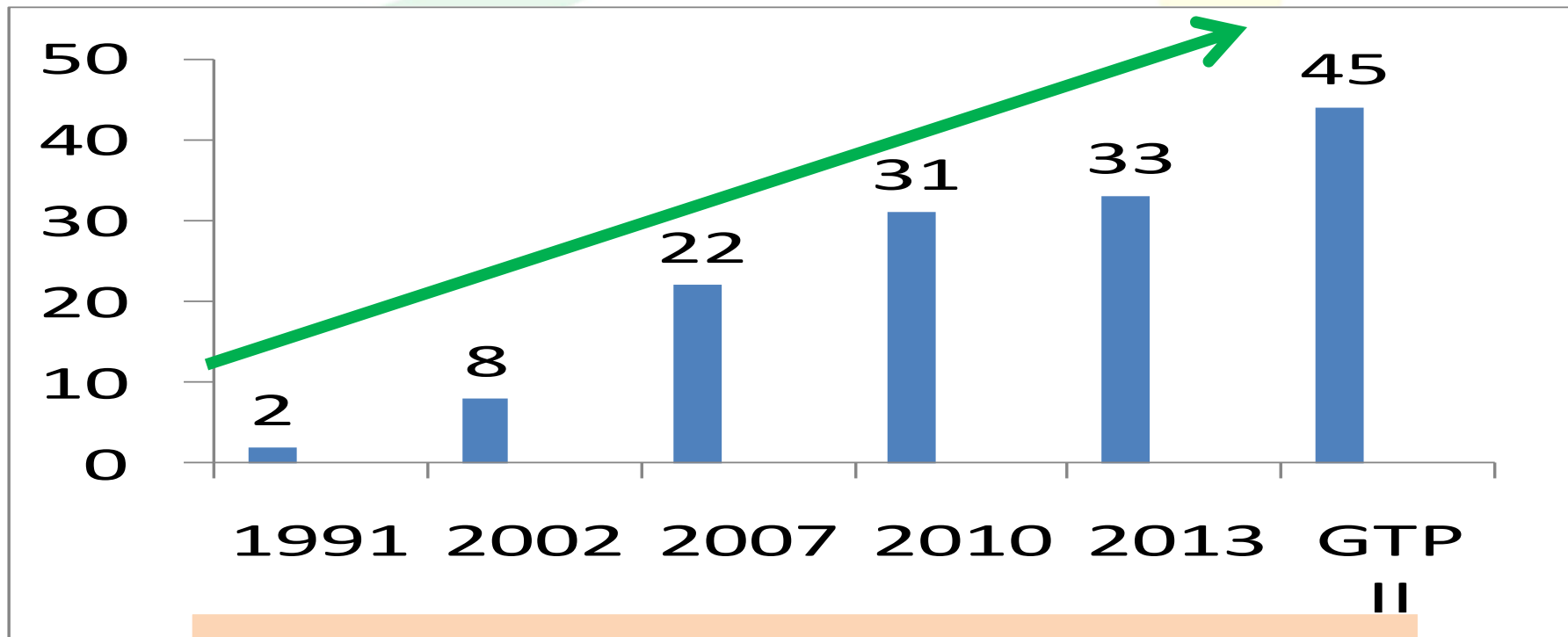


1. Human Resource Development: Human Resource supply and Demand





Human Resource Development: Schools, Colleges and Universities



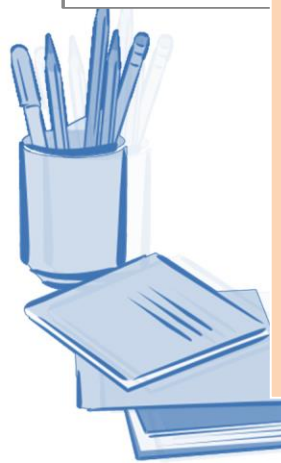
Specialized Public Universities: 5

Private universities: 4

Private HEIs (Colleges and Univ Colleges) : 229

TVET Colleges: 1622

Schools: 39,000





BETRE-SCIENCE: Science and Technology HRD mechanism

- *Betre-Science* is aimed to train more than 36,000 Ethiopians at different levels (Masters & PhD) in the coming 10 years overseas.
- It will *address some of the supply-demand deficits*





2. National Technology Road Maps



- **Tech-Roadmap in 24 Sectors**
- Agriculture (crop & livestock), agro-processing (meat & coffee), sugar, irrigation, cement, mining & petroleum, energy, railway, road construction, building construction, information and electronics, metal, chemical, textile, leather, pharmaceutical, environmental, fertilizer, edible-oil, space, nuclear, and bio & emerging technology roadmap



3. Expenditure on R&D (GERD as % of GDP in Ethiopia): implications for innovation

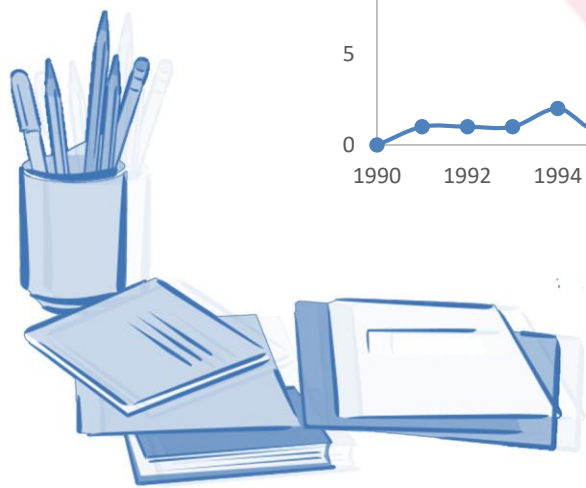
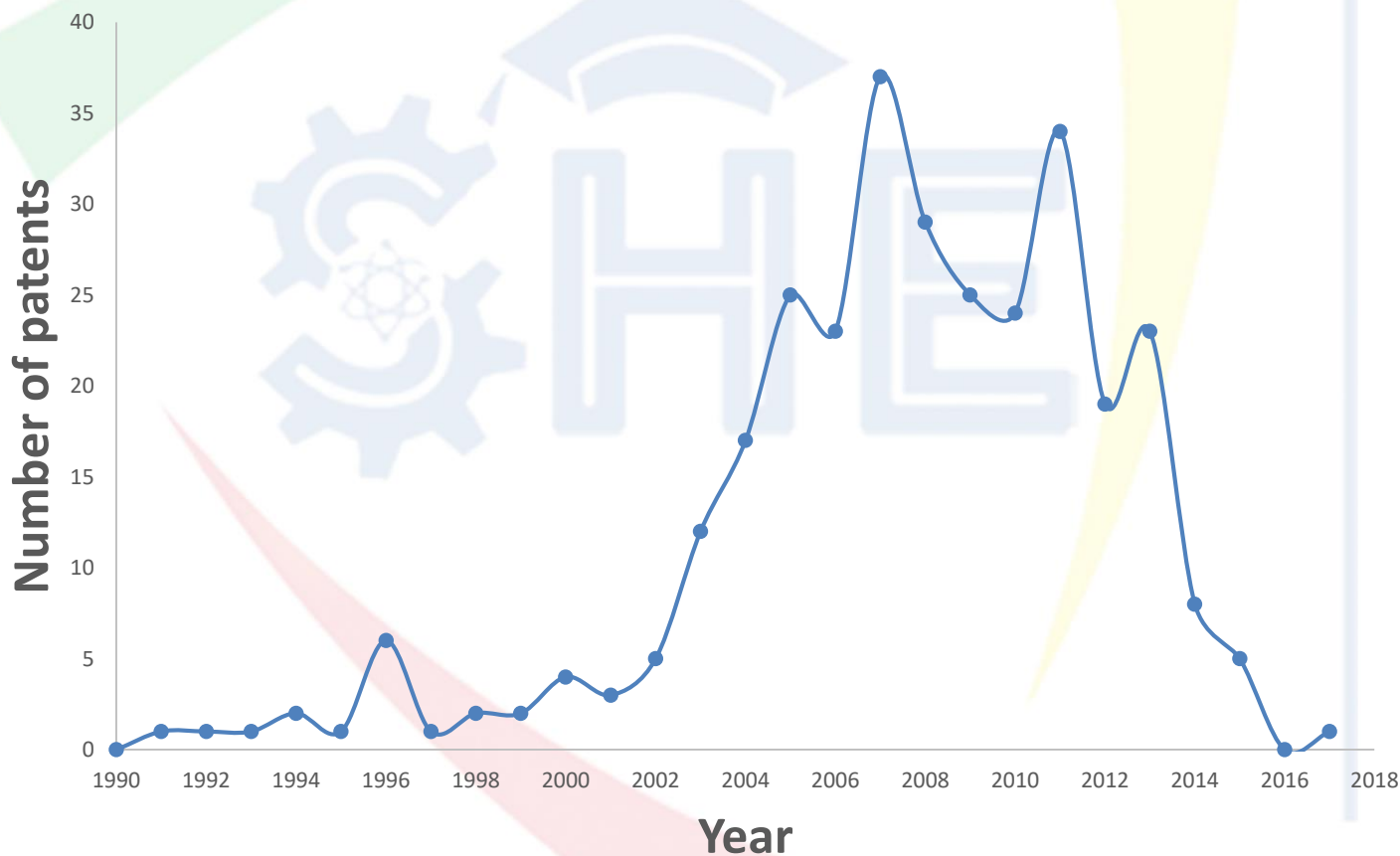
Country	Reference period	R&D Expenditure
Malaysia	2012	1.13
Kenya	2010	0.79
Moroco	2010	0.73
Egypt	2013	0.68
Mali	2010	0.66
Ethiopia	2013	0.61
Senegal	2010	0.54
Mozambique	2010	0.42
Botswana	2012	0.25
Gambia	2011	0.13

Source: UIS Catalogue of R&D Surveys, 2015; STIC R&D survey, 2014



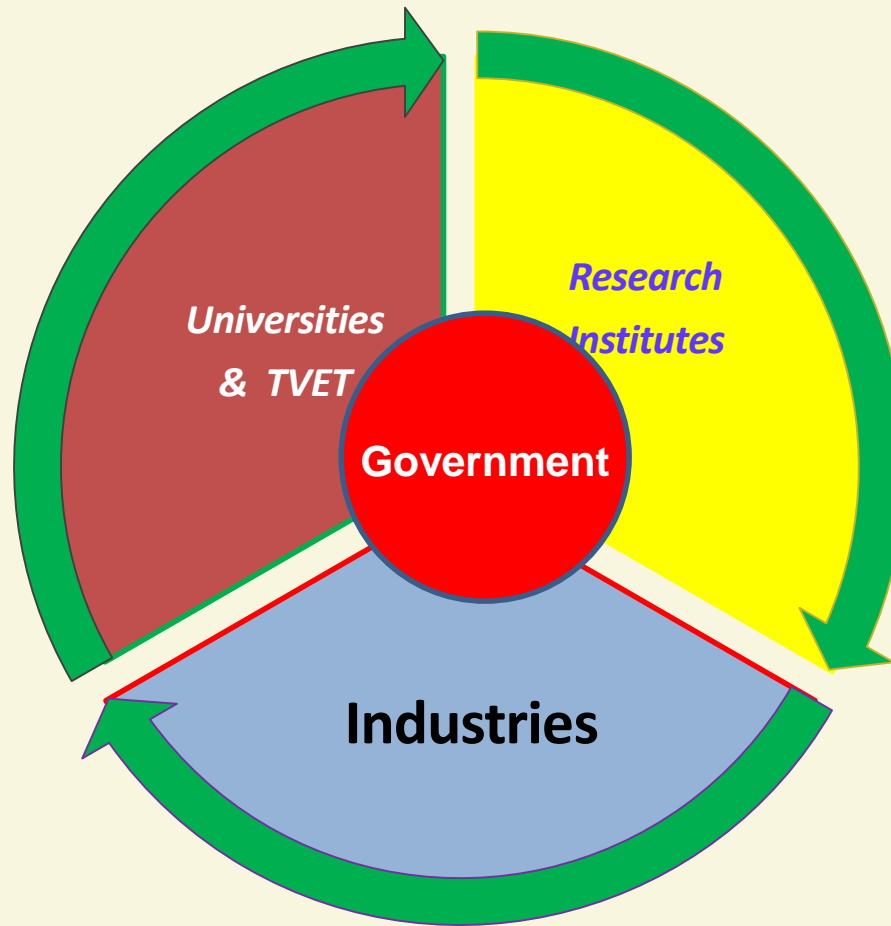


4. Patents Registered in Ethiopia: Implications for innovation





5. Universities, research institutes, TVET-institutions and industry Linkage





National GTP Priorities & STI: disconnect?

- Agriculture
- Health
- ICT
- Energy
- **Manufacturing**
- Water/Irrigation
- Mining
- Tourism



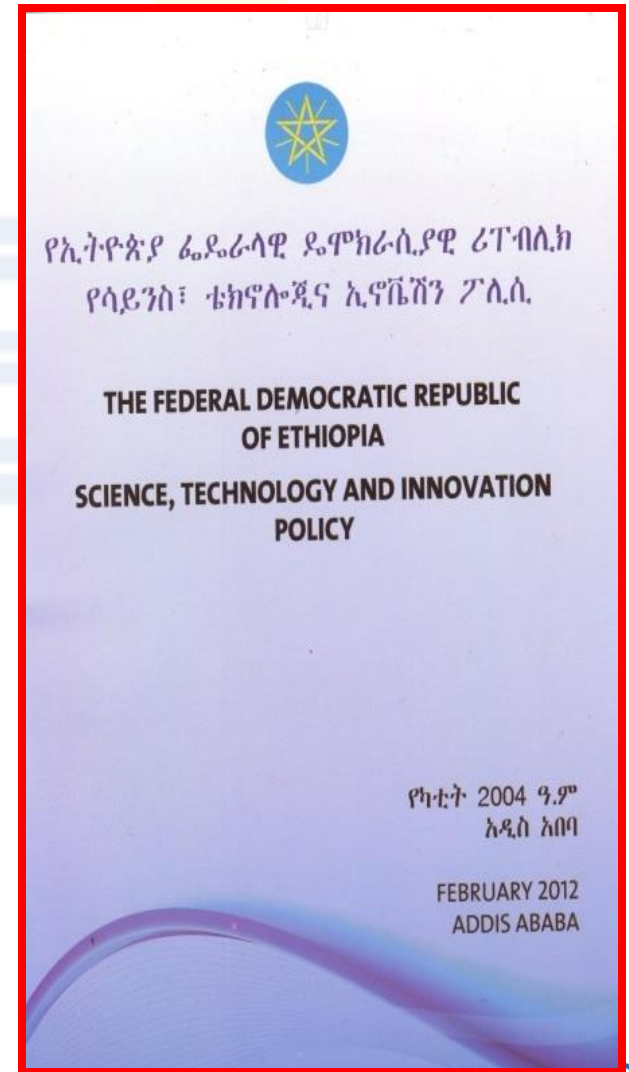
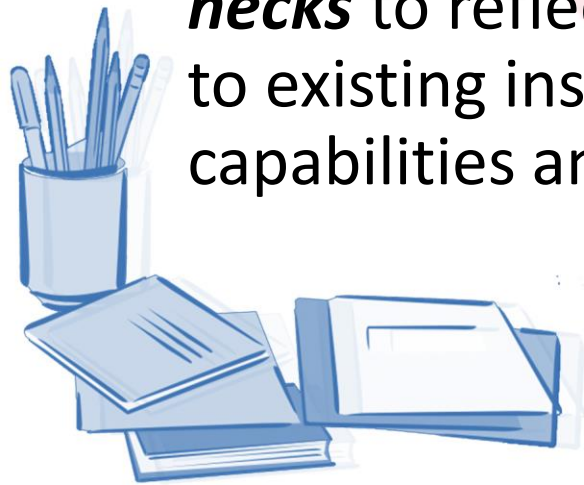
- **Agro-Processing**
- **Leather/Textile**
- **Foods/Beverages**
- **Metals**
- *Pharmaceuticals*
- **Chemicals**
- **Construction Inputs**





Addressing the Disconnect

- Substantial *disconnect between STI policy aspirations and the reality on ground.*
- In this context, there is *a need to re-visit the policy, its strategy and implementation bottle necks* to reflect more realistically to existing institutional capabilities and national needs.



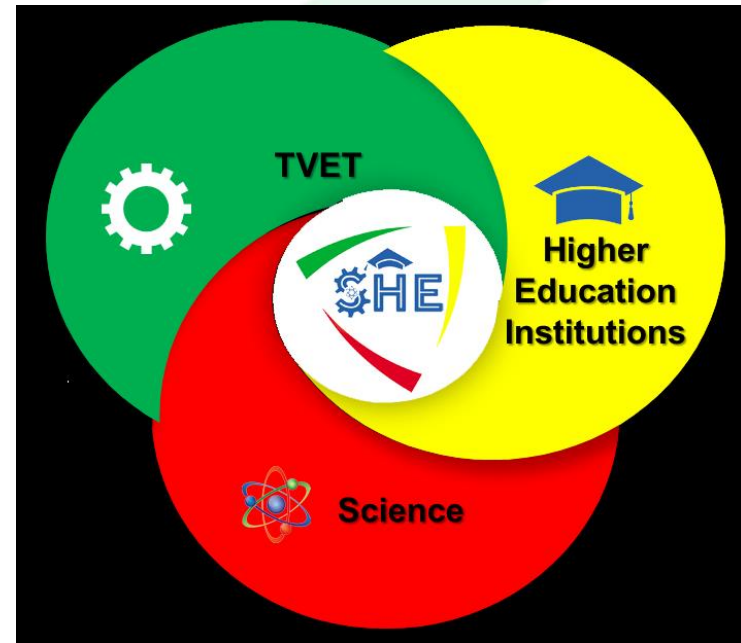


Ministry of Science and Higher Education (MoSHE)



MoSHE Role in Promoting Sustainable Development by Scientific and Technological Innovations

- The Federal Government established MoSHE in 2018 putting **three major pillars** together:
 - **Higher Education** (i.e., Universities)
 - **Science** (generation and application of knowledge and technology)
 - Technical and Vocational Education and Training (TVET)
- Each pillar addresses critical issues that contribute to **social transformation and economic development**.





MoSHE: Ethiopia's Education and Training Roadmap & 2020-2030 Perspective Plan on Science & Research Themes

1. *Diverse Reform Agendas from pre-primary to tertiary education*
2. *Curriculum Revision (Emerging technologies, etc)*
3. *Differentiation* of Universities based on their potentials (*Research, Applied Sciences, Comprehensive*)
4. Others

Higher Education

- Access in Higher Education
- Equity in Higher Education
- Unity in Diversity in Higher Education
- Quality in Higher Education
- Relevance of Higher Education
- Efficiency of Higher Education
- Research, Technology Transfer and Community Services
- Financing of Higher Education

1. Promote science, research and technology culture and outputs
2. Encourage creative thinking and tools development
3. Develop university-TVET-industry linkage
4. Discover and disseminate new knowledge through science and research
5. Develop curriculum that is enriched by science and indigenous knowledge
6. Develop intra- and international cooperation and partnerships
7. Develop and implement programs that take us beyond the 4th industrial revolution (AI)
8. Partner with other sector ministries to achieve objectives





None of the 17 Sustainable Development Goals can be achieved without the contribution of higher education, and research

<https://www.universityworldnews.com/post.php?story=20190719135507840>
<https://www.universityworldnews.com/post.php?story=20190719135507840>

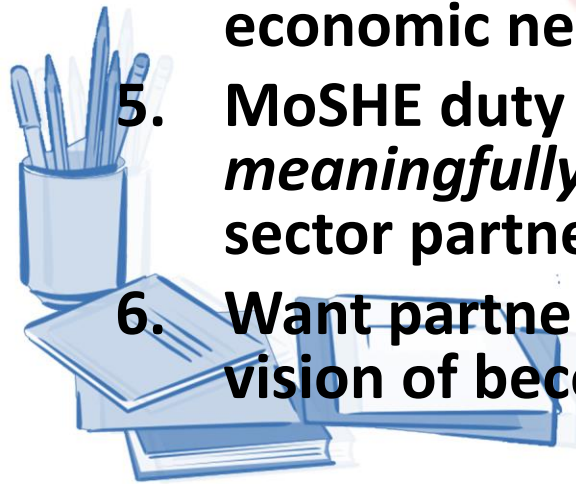
- Teaching
- Research
- Community Engagement





Conclusion

1. ***Huge government commitment*** in Promoting Sustainable Development by Scientific and Technological Innovations.
2. The STI and other policies and strategies and their *alignment* with continental (STISA) or Global (SDGs) are encouraging.
3. However, there is *disconnect* between policy/strategy and implementation (ex. Resources - HR/ Funding/ Infrastructure/etc.....).
4. Big assignment to support scientific and technological innovations & contextualizing innovation to socio-economic needs.
5. MoSHE duty bound to *promote STI for SDGs and meaningfully collaborate* with relevant institutions and sector partners
6. Want partnerships that will help us achieve SDGs & our vision of becoming a middle income economy.



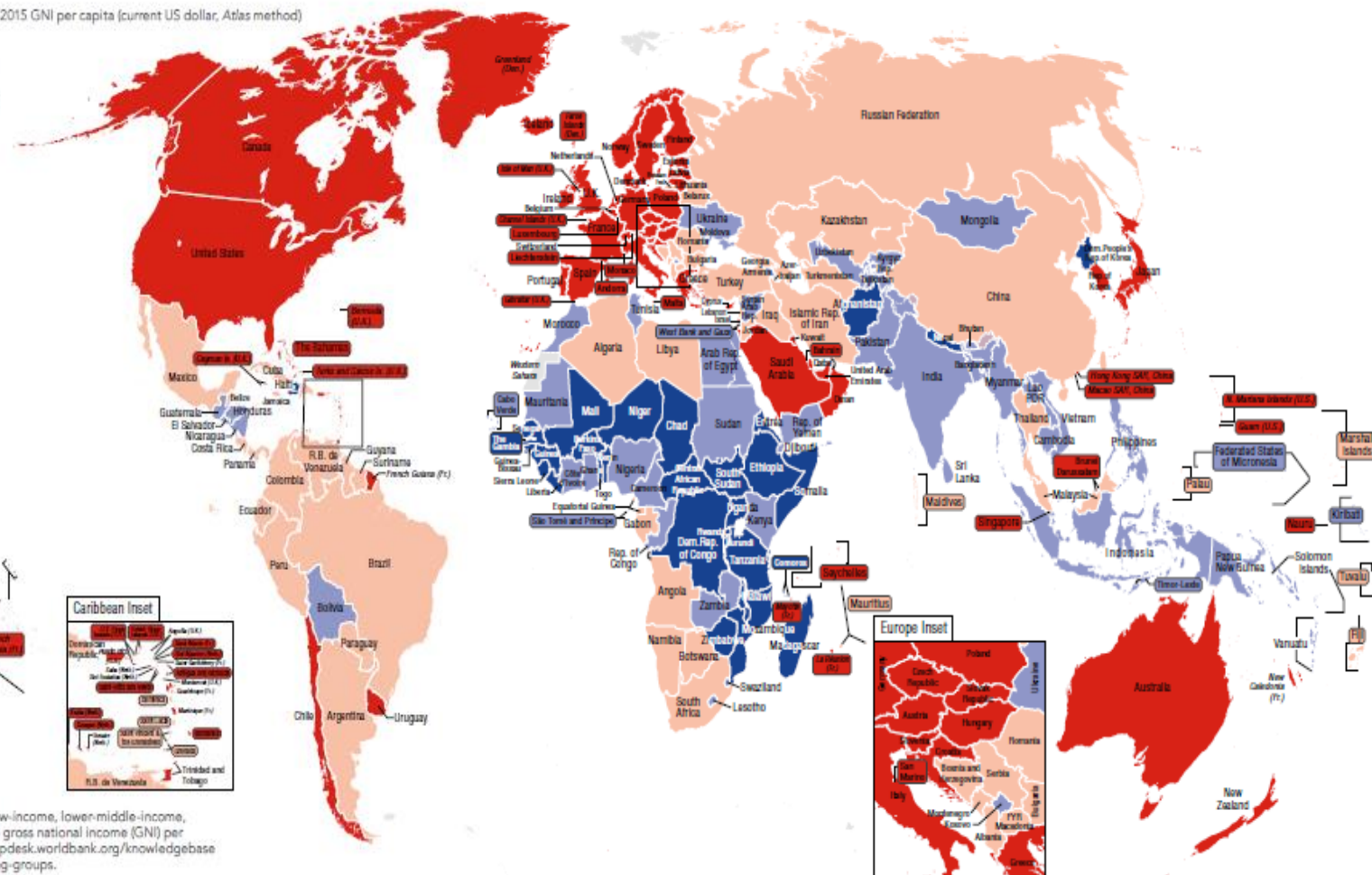


The World By Income – FY2017

The world by income, FY2017

Classified according to World Bank estimates of 2015 GNI per capita (current US dollar, Atlas method)

- Low income (\$1,025 or less)
- Lower middle income (\$1,026–\$4,035)
- Upper middle income (\$4,036–\$12,475)
- High income (\$12,476 or more)
- No data

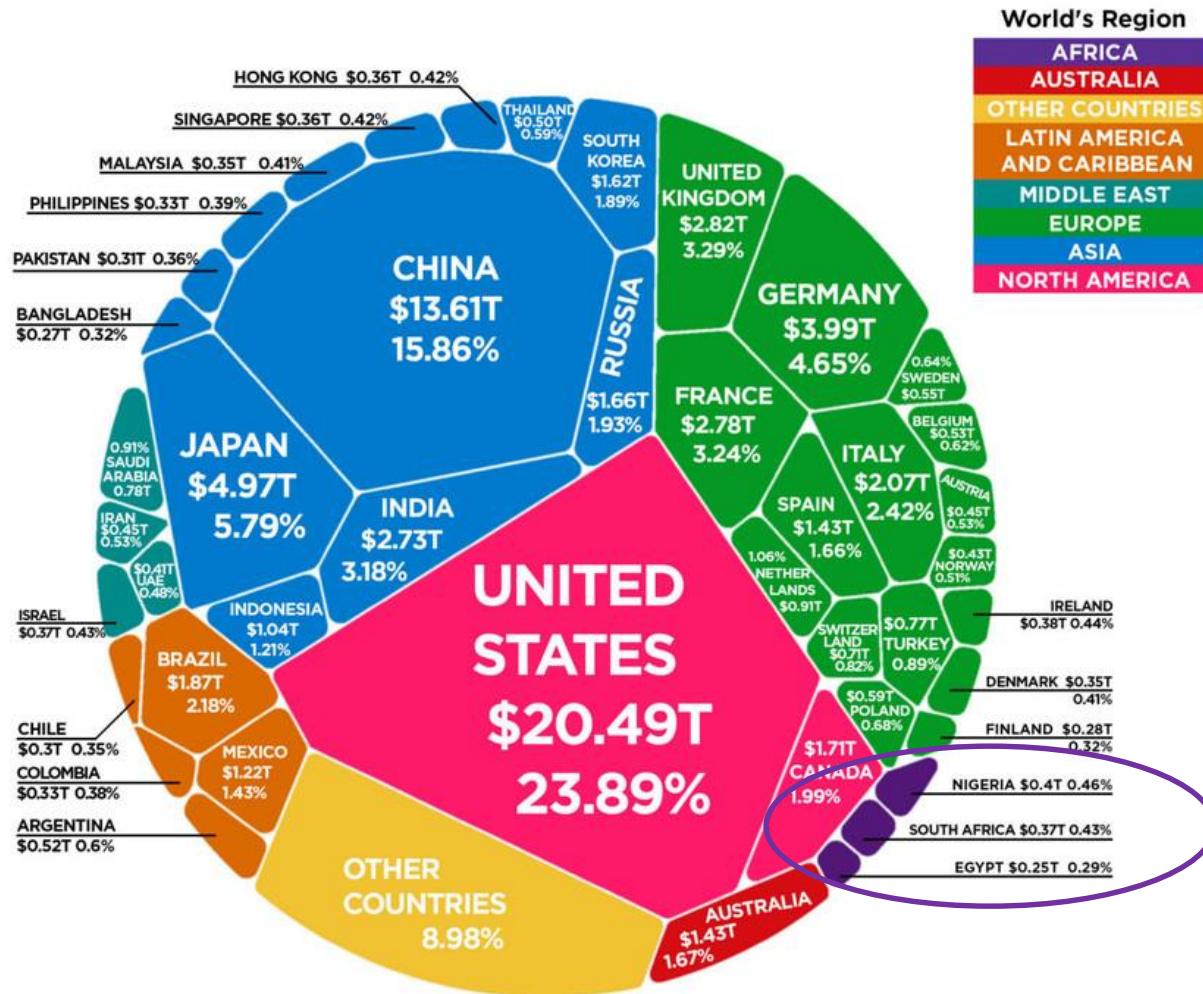


Note: The World Bank classifies economies as low-income, lower-middle-income, upper-middle-income, or high-income based on gross national income (GNI) per capita. For more information see <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>.





The \$86 Trillion World Economy in One Chart



Article & Sources:

<https://howmuch.net/articles/the-world-economy-2018>
<https://databank.worldbank.org>

howmuch.net





Thank you very much!

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