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Science, Technology and Innovation for Enterprise Development

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My experience as consultant in innovation support instruments, public policies and programs



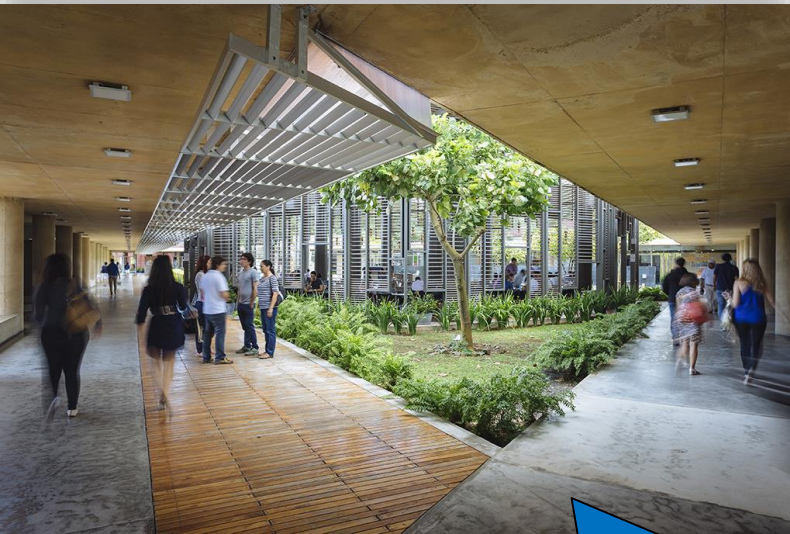
Among the founders of Montpellier Technopole (FR), one of the first French Science and Technology Parks and one of the most successful

Vice president, then President IASP (1986-92) and expert for the European Commission (Science Parks Consultancy Scheme, Regional Innovation Strategies)

Consulting jobs in developing / emerging countries:

- *1990s:*
 - Venezuela: National Plan for Technology Parks + 4 specific feasibility studies
 - Morocco: technopole of Casablanca Mohammed V Airport
 - Brazil: Missions to Rio Grande do Sul (Porto Alegre)
 - Uruguay: preparatory study
 - Turkey: METU Technology Park (Ankara)
 - Chile: PCT Universidad de Chile (Valle Lo Aguirre)
 - Panamá: technology park Ciudad del Saber
- *2000s:*
 - Tunisia: technopoles of Sousse and Monastir
- *2010s:*
 - Republic of Congo – projects of technopoles of Brazzaville and Pointe-Noire (2012-13)
 - Ecuador: ESPOL Technopark and Innovation Strategy of Guayaquil (2017-18)

Some pictures



Ciudad del Saber - PA



Technopole de Sousse - TN

Overview of my presentation

Starting from my core business = Science and Technology Parks (STPs) as instruments for supporting innovative entrepreneurship

Digital economy, optical fibre and start-ups in Africa

Addressing financial constraints faced by start-ups in Africa

Another approach of support to innovative entrepreneurship: innovation and regional development (ESPOL Guayaquil in Ecuador)

= My focus: how can governments meet start-ups needs, especially in the digital economy sector

- *(based on Technopolis Group experience: STP feasibility studies and evaluations, Agence française de Développement, African Development Bank, IDB Ecuador)*

STPs and incubators - Definitions

STPs are organisations which offer real estate with good quality standards to innovative businesses (and possibly R&D labs)

- while providing high added value services in the field of innovation, competitiveness and internationalisation

STPs objectives in general:

- *Favouring tech transfer and innovation to the benefit of companies which will locate in STP premises*
- *Supporting the creation of new innovative businesses (start-ups, spin-offs) = incubators / accelerators*
- *Attracting ‘advanced’ / high-tech foreign companies thus encouraging FDI*

Incubators / accelerators specifically address the second objective. A lot of STPs include an incubator:

- *An incubator is designed to accelerate the growth and success of entrepreneurial companies through an array of business support resources and services that could include physical space, capital, coaching, common services, and networking connections”*
- *Another word/concept used: accelerator, more focused on services, training (bootcamps) and equity funding*

STPs and incubators – Main features

Two components: bricks and mortars / services

- *Without services to companies, there is no STP, no incubator, but business or industrial parks*
- *Without real estate, no park of course – but incubators may support start-up projects without offering space and offices*

Two dimensions: bottom-up and top-down

- *Top-down: STPs and incubators are part of public policies or are initiated by academic institutions (universities, schools of engineers)*
- *Bottom-up: they have to address effective needs of the local/regional community – if not, the risk of failure is high*

Thus, an appropriate balance has to be found:

- *Between real estate and services (in some cases, money from real estate may be used to fund services ...)*
- *Between the bottom-up and the top-down approaches (ambitious while keeping feet on the ground ...)*

There is no ‘ideal model’, but a portfolio of examples to use and build upon (more than 1,000 STPs all over the world, and probably much more incubators)

From STPs and incubators to clusters and networks

Clusters are based on 'co-opetition' = co-operation and at the same time competition – they favour contacts and networking = particularly important for young firms

STPs and incubators have the advantage of making the 'co-opetitors' physically close, thus helping entrepreneurs to exchange and collaborate

OECD Definition of clusters: “Clusters are networks of interdependent firms, knowledge-producing institutions (universities, research institutes, technology-providing firms), bridging institutions (e.g. providers of technical or consultancy services) and customers, linked in a production chain which creates added value. The concept of cluster goes beyond that of firm networking, as it captures all forms of knowledge sharing and exchange”

Incubators and start-ups in Africa: multiplication since the 2010s – Overview:

IASP members in Africa (all with incubator facilities and services):

- *Botswana Innovation Hub, STP for Electronics Research & Industry (Egypt), VITIB SA (Ivory Coast), Konza Technopolis and University of Nairobi STP (Kenya), Mon Trésor Smart City Ltd (Mauritius), Technopark Morocco, Namibia Business Innovation Institute, Abuja Technology Village Free Zone Company and Lion Science Park (Nigeria), East London IDZ, Free State University and The Innovation Hub (South Africa), Roadmap Engineering (Sudan)*
- *Tunisia Technopoles/Competitiveness Poles are not members*

West Africa incubators:

- *ActivSpaces (Douala, Cameroon), WoeLab (Lomé, Togo), CIPMEN (Niamey, Niger), Jokkolabs (Dakar, Senegal), CTIC (Dakar, Senegal), iLab Liberia (Monrovia, Liberia), Mobile Web (Accra, Ghana), mFriday (Accra, Ghana), CoCreation Hub (Lagos, Nigeria), Wennovation Hub (Lagos, Nigeria), Business Incubation Program Africa (Pan-African Virtual Incubator), MEST Seed-Fund & Incubator (Meltwater School of Technology, Accra with 'satellites' in Lagos and Cape Town)*

African start-ups 2017 (Partech Africa, StartupBRICS.com):

- **More than 500 M\$ fund raised for start-ups (strong growth): 30% South Africa, then Kenya (26%) and Nigeria (20%) – multiplied by 14 2012-2017**
- **French-speaking countries: from 6 M\$ in 2015 to 37 in 2016 and 55 in 2017**
- **Fintech start-ups alone raised 119 M\$ in 2017 (+70% in comparison to 2016)**
- **Rapid development of the 'insurtech' sector: 14 M\$ in 2017 (+470%)**

Digital economy, optical fibre and start-ups in Africa

Incubators have multiplied in Africa as well as start-ups in the sector of digital economy / ICT in the last past years

However, two aspects or problems have to be considered:

The first one regards infrastructures: access to high-speed internet = importance of benefiting from access to optical fibre

Ex.: project of technopole in Brazzaville born from the planned arrival of the optical fibre (Technopolis+IDATE)

The other is financial: telecommunications tariffs, public monopolies, regulatory framework, opening up to competition of the telecommunications sector

- IDATE studies
- On the average, internet access is 6 times as expansive in Africa as in Southeast Asia
- 'Historical operator' monopolies: risk = abuse of dominant position

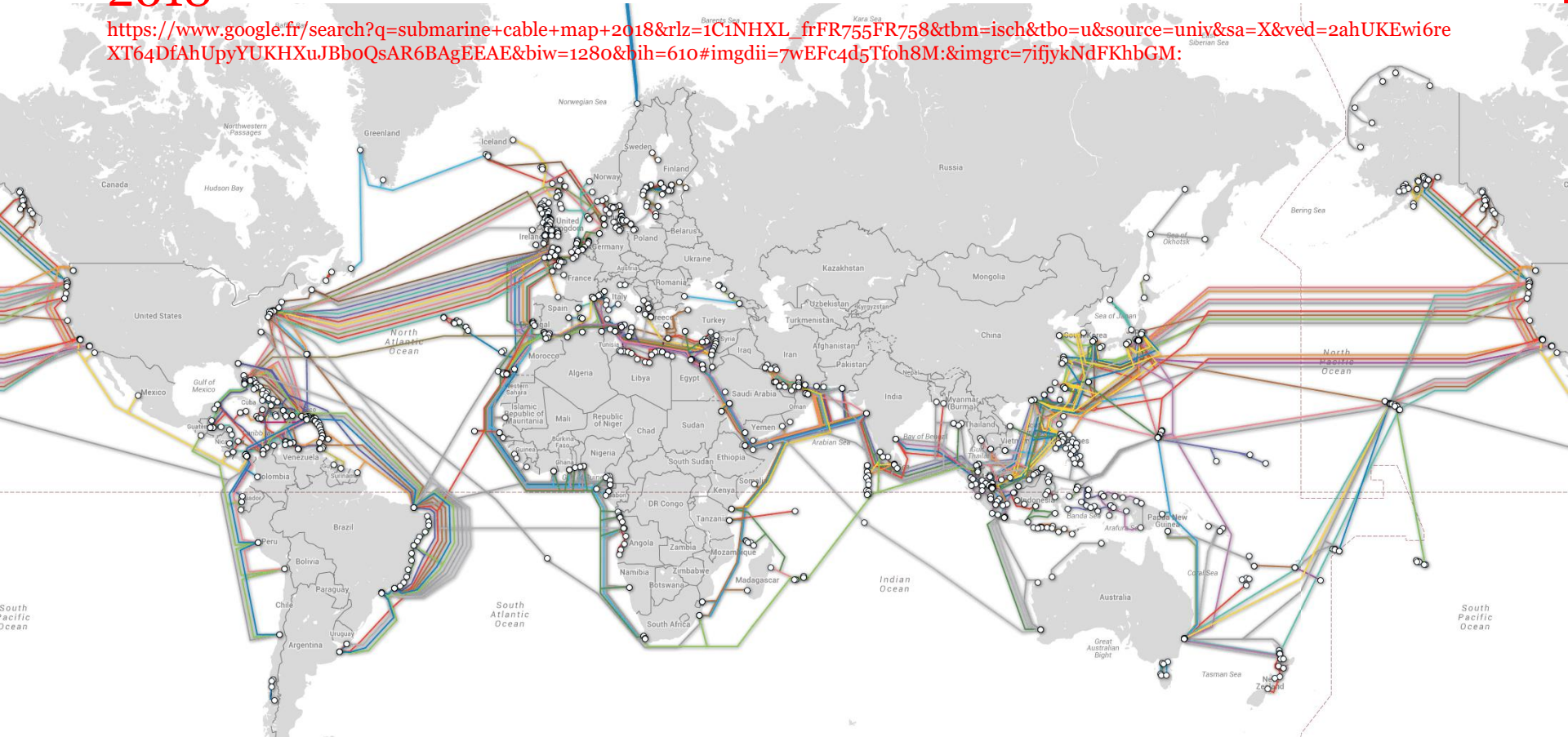
Governments have a double role to play – See SDG 9c:

Funding infrastructures (national backbones and connection to int'l networks) together with donors

Defining an appropriate regulatory framework

2018

https://www.google.fr/search?q=submarine+cable+map+2018&rlz=1C1NHXL_frFR755FR758&tbm=isch&tbo=u&source=univ&sa=X&ved=2ahUKewi6reXT64DfAhUpYUKHXuJBboQsAR6BAGEEAE&biw=1280&bih=610#imgdii=7wEFC4d5Tfoh8M:&imgc=7ifjykNdfKhbGM:



Addressing financial constraints faced by start-ups in African countries (1)

Well-known financial constraints for start-ups in Africa (and elsewhere...):

- *High interest rates (10 to 17% in French-speaking African countries) and inadequacy of the banking system*
- *Entrepreneurs (SMEs) cannot provide collaterals (more or less, everywhere)*
- *Lack of public support programs and innovation support policies (at the best, work in progress), except donors*

Addressing financial constraints faced by start-ups in African countries (2)

Solutions (out of bank loans) for financing start-ups in Africa:

Loan guarantee: of limited use for start-ups since their access to bank loans is limited

Ex.: ARIZ (AFD=Agence française de Développement) system covers loans to SMEs and to micro-finance institutions (individual and portfolio guarantees)

Zero-interest loans (soft loans): a fall back position or a 'bandage'

Seed- and venture-capital funds (equity)

Ex. : Terenga Capital, seed-capital fund with 4.9 M€ (Senegal)

Some incubators/accelerators have their own VC fund

Ex.: MEST Seed-Fund & Incubator (Meltwater School of Technology)

Business Angels: not very developed (limited tax incentives) – however:

Cameroon Angels Network
Ivoire Business Angels

Addressing financial constraints faced by start-ups in African countries (3)

Diaspora funding:

Ex.: an RDC engineer created a start-up in France using a French public program providing seed money; it gave him sufficient credibility to convince the French mobile phone operator to develop with him activities in Africa (www.mezaa.org)

Ex.: project of a VC fund by Republic of Congo expats to support start-ups in their country

Crowdfunding (mobile phone as a key instrument):

Ex.: Faso Soap (Burkina Faso) (<https://www.faso-soap.info/>) collected 70,000€ through the ULULE platform (<https://fr.ulule.com/>)

Contests and grants: incubators and accelerators partnering with companies

Ex.: CTIC Dakar with the mobile phone operator Tiko started in 2015 the Buntu Teki program to support about 10 projects / yr. through providing seed grants

Ex.: Orange (French-based mobile phone company) launched a contest for African social entrepreneurs, Total a contest 'Startupper of the Year'

Other initiatives in developing and emerging countries such as Seedstars (<https://www.seedstars.com/>) based in Switzerland: contests, bootcamps, investors forums, networking, etc.

Addressing financial constraints faced by start-ups in African countries (4) – Ex.: AFD programs (a)

AFD (Agence française de Développement) contests:

- *‘Digital Africa’*
- *‘Digital Challenge’ 2018 aimed at supporting 10 start-ups (5 French, 5 African) targeting African markets*

ARIZ loan guarantee system for SMEs in general (not targeted at start-ups)

- *Individual guarantee: up to 2 M€ and 50% of the loan for SMEs (75% for IMF)*
- *Portfolio guarantee: 50% of the value of loans between 10 and 300 K€*

“Afrique Innovation” = a program created by AFD

- *Background: incubators face difficulties in making start-ups sustainable (high level of risk, deferred or uncertain profitability) and they face themselves difficulties of access to funding*
- *Strategy:*
 - *supporting in some Western African countries the structuring of a network of incubators of innovative business projects*
 - *contributing to creation of new qualified jobs*

Addressing financial constraints faced by start-ups in African countries (4) – Ex.: AFD programs (b)

“Afrique Innovation” instruments:

3 pilot incubators:

*CTIC Dakar (www.
http://cticdakar.com/fr_fr/)*

CIPMEN Niamey (<http://www.cipmen.org/>)

*Bond’Innov (located in France near Paris, supporting projects related to migrants from Africa with a potential impact in African countries – ‘North-South incubator’)
(<https://www.bondinnov.com/l-incubateur>)*

An online platform Africinnov.com: on-line resources centre for incubators

A support fund aimed at accompanying young businesses hosted in the 3 pilot incubators: zero-interest loans (‘repayable advances’) from 15,000 to 30,000 €

New AFD project (feasibility study): a ‘financing facility’ in favour of digital innovation (65 M€) for:

Supporting the emergence of an African innovative ecosystem to the benefit of the actors of digital innovation

Improving the access to finance of start-ups (VC and seed)

The future: Preparing for the 4th Industrial Revolution in Africa

The African Development Bank is launching a 'Study to Unlock the Potential of the Fourth Industrial Revolution in Africa'

- *“a report that details some of the principal new technologies, highlights their use cases in Africa and determines the business case for a local supply of these emerging technologies and their adoption by African Governments, business and citizens. The overall goal of the report is to identify the real reasons why certain technologies could and should be adopted in Africa and to recommend actions for African governments, the private sector and development partners, in particular the ADB”*
- *“This fourth industrial revolution (4th IR) with its agile growth is characterized by a fusion of technologies that blurs the lines between the physical, digital and biological spheres and that disrupts the industries of all countries”*
- *Emerging technologies targeted: (i) internet of things; (ii) blockchain; (iii) artificial intelligence and advanced robotics; (iv) big data analytics; (v) virtual and augmented reality; (vi) 3D printing and custom manufacturing*
- *“The 4th IR Technologies foster exciting opportunities and some foreseen challenges for the continent with the **technological advances in renewable energy, usages of Artificial Intelligence and connected devices (IOTs) into critical sectors of Africa (e-Health, e-Agriculture)** on one hand and the anticipated loss of low-skilled jobs induced by some of the technologies on the other hand”*

A specific case study: the ESPOL Guayaquil project of STP in Ecuador: focus on regional development

ESPOL: leading actor at regional level
as a school of engineers – concept:
making ESPOL skills profitable to the
South-West of Ecuador

Survey of
enterprises' needs
for innovation and
competitiveness
(Technopolis)

Support the
development of
digital services
in 3 sectors:

Health

Tourism

Agro-food (shrimps, cacao): meteorology, quality, marketing

Practically, no public
money available
(programs in support
of innovation, projects
of support to start-ups
only on paper):

Tax breaks to companies establishing in ZILE

Search for sponsorship from some large companies

Conclusion: some policy considerations

Support STPs and incubators = physical space for hosting start-ups

- *Equipped with high-speed internet*
- *At reasonable rent prices (lower than downtown market rents)*

With accompanying services:

- *Clustering / networking: vertical (digital services applied to the health, agrofood, tourism etc. sectors) as well as horizontal*
- *Access to finance through equity, soft loans and loan guarantees*

Provide an appropriate legal and regulatory framework, in particular:

- *IPRs*
- *Competition regarding ICT operators (against monopolies)*
- *Banking regulations (default)*

... and don't forget local/regional development

Conclusion: some policy considerations

Question: may digital economy services provide or favour an accelerated path to successful development in Africa (skipping the 'manufacturing phase' [Kuznets, Rostow]) ?