

Conceptual Framework for Planning of National Transport Infrastructure and Global Trends



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1. Background and context for the research and study

- Transport accounts for 2-11% of GDP worldwide
- Transport is one of the prime economic sectors
- Efficient management of the transport sector is essential
- *New paradigms:*
 - more transport → less transport
 - big planning → smart planning
 - on way → online
 - SDG 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation

1. Background and context for the research and study

- *Research focus:* Planning of National Transport Infrastructure (NTI)
- Commonly used plans:
 - National Development Plan
 - National Infrastructure Plan
 - National Transport (Master) Plan
 - Investment Plans and Programs
- There exists a large variety of NTI planning practices and procedures

1. Background and context for the research and study

Research objectives

- To identify the basic concepts and steps of the planning of NTI and factors affecting their success.
- To investigate the major and successful planning practices regarding NTI (outside the OIC geography).
- To describe the general situation related to the planning of NTI in the OIC Member States and to analyse the NTI planning practices and experiences of the six selected OIC Member Countries as case studies in detail.
- To propose recommendations for enhancing better planning practices for NTI among the OIC Member States.

1. Background and context for the research and study

The study is structured in seven framework areas

1. Political and legislation
2. Institutional and organization
3. Technical factors
4. Procedural factors and financing
5. Content of NTI planning
6. Data collection method
7. Monitoring and evaluation system

1. Background and context for the research and study

Work undertaken

1. Literature review
2. Desk research of planning procedure in OIC and non-OIC regions
3. Questionnaire surveys to government institutions, academia, private institutions
4. Field visits to three (out of six) case study countries

QUESTIONNAIRE for the Study on :
"Planning of National Transport Infrastructure in the OIC Member States"
to be filled out by the OIC Member States during the **11th Meeting of The COMCEC Transport and Communications Working Group in Ankara, March 15th 2018**.
The study is conducted by Fimotions. We thank you in advance for your time and participation.

Please fill in your details below or attach your business card.

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Introduction

1) What is a National Transport Infrastructure Plan in your country? Please choose.

a. A visionary (abstract) long term document
b. A list of concrete investment projects (ambitions)
c. A list of concrete investment projects (formally approved)
d. Other

2) What is the name of this planning document in your country?
.....

Part I: Political and Legislation Factors

3) The extent to which a decision making on transport infrastructure investment is influenced by transport policy

1	2	3	4	5
Very low		Very high		

4) Degree to which international transport infrastructure related agreements have an influence on planning of national transport infrastructure

1	2	3	4	5
Very low		Very high		

5) The extent of implementing the ratified international agreements into your national transport planning

1	2	3	4	5
Very low		Very high		

Part II: Institutional and Organizational Factors, including Institutional Capacity

6) The extent to which a decision making on transport

1	2	3	4	5
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2. Main concepts and definitions

NTI Planning

- being a complex process
- consists of policies, goals, objectives, programmes and sets of projects
- provides the *planning framework*, in which individual projects go through the process of identification, selection, appraisal and approval.



2.1 Political and legislation factors

- *'Policy first'*
Policy should guide how the transport sector is being managed
 - Without policy, the context within which decisions are rationalised becomes problematic
 - Yet, few transport plans are written within a policy framework
 - In developed countries, *minimizing traffic while maximizing accessibility* has been the driver of their transport policies
- Regulatory measures
 - Legislative amendments
 - Organizational changes
 - Degree of harmonization among national and regional governments

2.1 Political and legislation factors in OIC region

- OIC Member States desire to be more *policy driven*
- Need for both transport policy and master plan is increasingly recognized, especially in the Middle East, Asia and Africa. In Central and Southern Asian countries, this is a rarity
- The Draft Transport Policy of Nigeria recognizes the role of transport to provide mobility, rather than building roads
- The Pakistan Transport Policy and Master Plan 2017 also reveals a desire to employ a more contemporary approach to transport planning
- IFIs insist on there being a transport master plan and policy before considering project funding

Nigerian Transport Policy Objectives

1. To promote economic development, expand an efficient and affordable integrated transport towards the private sector participation in the upgrading of transport infrastructure and services; 2. to promote a culture of mass private cars; 3. to promote a culture of mass infrastructure and services; 4. to promote a culture of mass services in Nigeria; 5. to improve the safety, security of goods and people, at local, national, and international that ensures environmental sustainability and States and the Federal Capital Territory in systems and local governments in developing a (Government of Nigeria, 2010).

2.1 Political and legislation factors outside OIC region

South Africa National Transport Master Plan 2050

The South Africa National Transport Master Plan 2050: 1. is well planned, integrated and aligned across sectors; 2. is responsive to growing passenger and freight customer needs; 3. supports an inclusive spatial vision; 4. is well maintained and preserved and further developed to address/overcome developmental challenges; 5. supports economic competitiveness through seamless multimodal trade corridors; 6. offers safe, affordable and accessible modal options for passengers; 7. preserves the environment; 8. is managed by strong institutions; 9. is supported through effective policy and regulation; 10. is innovative/adaptive and reflects emerging priorities; 11. is sustainably funded; 12. is effectively implemented through accountable delivery mechanisms.

- These 12 criteria might be instructive; “sustainable development” and “climate change” might be added.
- Different countries put different emphasises
 - Kenya: integrated land use and transport
 - North America: city-focussed
 - Colombia: aligned policy of reducing climate change

2.2 Institutional and organizational factors

- Transport planning is highly *centralized* in less developed countries and *devolved* in most developed ones
 - Ministries of transport are not the only government administration that plans transport
 - Single purpose ministries >< multi-purpose and mixed policy objectives → *Inter-ministerial cooperation* should be self-evident
- Institutional procedures
 - Division of duties and responsibilities among governmental agencies
 - Integration with inter/trans-national transport networks

2.2 Institutional and organizational factors in OIC region

Dubai	Indonesia
<p>Road and Transport Authority Dubai as a successful authority with 5 agencies:</p> <ol style="list-style-type: none"> 1. Public Transport Agency 2. Traffic and Roads Agency 3. Rail Agency 4. Licensing Agency 5. Dubai Taxi 	<p>No national transport authority</p> <ul style="list-style-type: none"> • Ministry of Transport: policy • Ministry of Public Works and Housing: toll roads • Ministry of Maritime Affairs and Fisheries: sea transport • Aviation and Railways are wholly state-owned organizations



Would benefit from a much more holistic and integrated approach, and a national transport authority

2.2 Institutional and organizational factors outside OIC region

National Transport Authorities – small sample

Ireland National Transport Authority	Small public service vehicles, PT control/services, information, infrastructure, policy, planning, land use, parking and enforcement
New Zealand Transport Agency	National Land Transport Programme, Vehicle Licensing and Control, Walking, Cycling and Public Transport, road rail commercial driving

- Responsible for both transport network and operation
- Have powers to impose taxes, collect fees and impose fines
- Controlled by locally elected officials and represented by users and private sector

2.3 Technical factors

- Integrated approach of policy and transport modes
- Evaluation of alternatives and prioritization among transport modes
- Environmental Impact Assessment
- Development of multi-modal transport strategies

Land Use



Travel



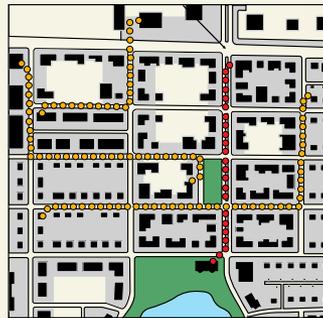
Road Capacity

GENERATES

DEMANDS



Anticipate



Forecast
(Based on Speed)



Accommodate

(a) Conventional Transportation Planning

Transportation
Investments



Travel



Land Use

HELP MANAGE

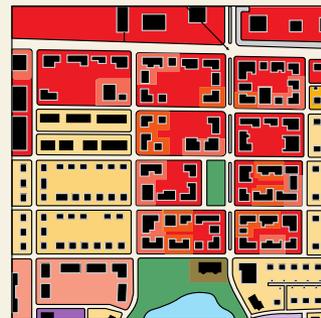
INFLUENCES



Multi-Modal



Manage



Coordinate

(b) Integrated Land Use and Transportation Planning

2.3 Technical factors in OIC region

- The technical aspects of NTI planning in OIC countries are going in the right direction
- Various transport related aspects such as land use and multimodal transport logistics are well integrated
- *Multimodal* freight logistics in the NTI planning of the OIC countries are of high importance → most OIC countries are signatory parties to international transport corridors
- *EIA* is mandatory to undertake
- Socio-economic evaluation and CBA to prioritize projects are being implemented

2.3 Technical factors outside OIC region

- French planning system requires to undertake systematic *ex-post assessments* of public infrastructure investments
- In EU Member States, *Strategic Environmental Assessment* is a formal requirement to assess the effects of certain plans and programmes on the environment
- Tanzania Comprehensive Transport and Trade System Development Master Plan 2030 incorporates the *development of international corridors* that connect the East Africa region.

2.4 Procedural Factors, Financing

NTI plans are *complex*

They have an *impact* on society

The group of potential users is *large* and geographically *spread*

- Public inquiries
- Participation of stakeholders
- Pricing of infrastructure
- Private finance

Ideally, decision hierarchy starts at the *strategic* level and ends at a *pragmatic* and detailed level.

- policy objectives (What is our *goal*?)
- to options (What are the various *ways* to reach our goals?)
- means and restrictions (What are the *means* available?)

2.4 Procedural Factors, Financing

Formal and *procedural selection* and appraisal guidance in NTI planning is to be preferred to *isolated decisions* by decision makers:

- We are not good at considering many variables and aspects simultaneously; instead we tend to *focus* on one or very few aspects and are often unaware that we do this;
- We usually reach decisions very *rapidly* based on gut instinct or subconscious analogy. Then we tend to look for evidence and arguments which support the decision;
- We are prone to wishful thinking, optimism *bias* and loss aversion, so we have difficulties in abandoning an idea or a decision once we have settled for it;
- We tend to *over-generalize*, turning anecdotes or single cases into general rules;
- We are not good at understanding or comparing different orders of *magnitude*;
- Moreover, we are *not aware* of these processes and if made aware of them can find them quite threatening.

2.4 Procedural Factors, Financing

Funding. "Without funding no project"

- *Public* finance or tax funding
- *Soft* finance (conditionality)
- *Private* funding
- *Mixed* sourcing (COMCEC Transport Working Group, in March 2013 on PPP)
- *User* based funding (pricing)

Stakeholders

- In order to measure user *needs*
- to assess users' *affordability*
- to guarantee a smooth *implementation*
- to use wider intelligence base
- implicit "*licence* to operate"

2.4 Procedural Factors, Financing

Time perspectives

- The planning *horizon* of the national plans: long, preferably without losing agility; 4-15 years for OIC, 10 to 20 years for non-OIC;
- *Intervals* between subsequent editions of the national plans: preferably consequent time intervals, 4 to 5 year cycle, but often non-structured or unknown;
- The *discount* rate: financial discount rate reflecting opportunity cost of capital, and social discount rate reflecting the valuation of distant future versus short term effects;
- The time horizon applied in project appraisal required or applied in the project appraisal: recommended project *lifetime* or 40 years.

2.4 Procedural Factors in OIC

- The transport planning approach is mostly *top-down* with the leader's vision sets the strategic direction.
- The involvement of the *private* sector and academia in the transport planning process is very low.
- Public consultation and stakeholder participation have been practiced with different levels of involvement. The *procedures* however require strengthening.
- *PPP* is being the most common practice of financing although the success rate in increasing project funding from the private sector is low.

2.5 Content of NTI Plan

1. Identification of *problem* and needs;
2. Problem *analysis* including description of status quo;
3. Policy context and policy *objectives*;
4. Project *formulation* and appraisal;
5. Political choice between short listed *options*;
6. *Implementation*;
7. Monitoring and *evaluation*.

- Review and evaluation
- Financial planning
- Objectives, performance
- Scenario analyses, forecasting
- Scientific methods, techniques
- Planning horizons

2.5 Content of NTI Plan

Problem and needs:

- Limited *access*
- *Congestion*
- Unacceptable *risk* from changing atmospheric conditions
- High transportation costs, lack of *competitiveness*
- New housing schemes leading to non accommodated *demand*, ...

Policy context and policy objectives:

- Horizontally and vertically *integration*
- Consistency regarding *policy* measures
- Consent to the desired future *trends*

Investments should be optimized by comparing them to the *best alternative investment* in view of the specific transport objective

National Transport Master Plan for the Republic of Turkey

Aim: improving transport being a priority for Turkey's economic and social development.

Activities to develop the plan include:

- (1) collecting traffic data across the country;
- (2) developing a transport model which will be used to forecast travel projections;
- (3) identifying key transport infrastructure investment projects over a period of 30 years

Funded by EuropeAid, the Master plan Strategy will focus on Intelligent Transport Systems and Air Transport and Navigation. The Master Plan will be used to inform the development of guidelines for Urban Transportation Plans.

2.5 Content of NTI Plan

Project formulation and appraisal

Investment options need to be listed and then prioritized

Taking into account financial feasibility, economic *sustainability* and social and regional *inclusion* (affordability and access)

Comprehensive *guidelines* include design, financial and economic optimization (benchmarking with project alternatives), allow for additional finance and lay the foundations for a KPI structure (ex-post evaluation)

Political choice between short listed options

2.5 Content of NTI Plan

There are three groups of methods of *project appraisal*:

Cost Benefit Assessment (CBA),
Multi Criteria Analysis (MCA) and
Economic Impact Assessment (EIA).

There are several project *evaluation criteria* used to profile individual projects. The most used criteria are

Net present value (NPV),
Internal rate of return (IRR), and
Benefit-cost ratio (BCR)

2.5 Content of NTI Plan

Performance KPI can be measured via the following indicators:

Present Value of Benefits (PVB)

Present Value of Costs (PVC)

Economic Net Present value (ENPV)

Benefit to Cost Ratio (BCR)

Economic Internal Rate of Return (EIRR)

Scenarios: show how different *alternatives* perform under important future *constraints* (externalities), like:

Climate change,

Implications of demographic change and

Changes in local and global economy

2.5 Content of NTI Plan in OIC

- Very few NTI plans are *accessible* and made public. They are prepared within and for a narrow circle.
- The value of stakeholder and public *consultation* is endorsed, but rarely being practiced.
- In *national strategies* and development plans security and basic utilities are of high priority. *NTI* plays a minor role. Exceptions seem to be Afghanistan, Malaysia, Senegal, Turkey, Qatar and Uganda.
- NTI plans are output based, while good NTI planning practices are *outcome* based.
- Most of the NTI plans are not compliant with or not taking the *Sustainable Development Goals* into account.

2.6 Data Collection Methods

Data are the *eyes* of the driver.

Data collection is very *expensive*.

Data collection is a *long term* investment.

Issues related to data collection are the identification of:

- Key data related to NTI;
- Key Performance Indicators related to NTI;
- Ways to apply *new technologies* for data collection;
- Ways to disseminate data in order to *improve decision making* both by public and private decision makers.

- Data and statistics collection mechanisms and methods
- Implementation of household and industry surveys

2.6 Data Collection Methods

There are several reasons to collect data:

- design and dimensioning of infrastructure (Who *uses* it, and for what purpose?);
- cash revenues and non cash benefits (What are the *benefits* of the existing infrastructure?);
- maintenance and operations (What are the *costs* of the existing infrastructure?);
- asset management (What is the state of the *stock* of infra assets?);
- adequateness of the infrastructure (What is the need for additional infrastructure? Is there a policy to influence *efficient use* of infrastructure?);
- competitiveness (How would this affect the costs of transportation and international *competitiveness*?).

2.6 Data Collection Methods

There are several methods to collect data:

- *Automated* data collection, via cameras, sensors, registering devices, transponders in or aside the infrastructure, mobile telephone data
- Household and industry *surveys*, zoning, census information
- Forecasting (data science and data analytics), big data, *modelling*

Aspects to pay attention to when collecting data are:

- *access* and *ownership* of data (public data versus private data)
- data *sources*
- data *storage*

2.6 Data Collection Methods

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- *competitiveness* (How would this affect the costs of transportation and international competitiveness?).

2.6 Data Collection Methods in OIC

- In some cases, data for plans and projects are collected as needed by *consultants* and *research institutes* through surveys of various kinds.
- In other cases, transportation data are collected annually by the *government*.

2.7 Monitoring System

Three types of evaluation:

- *Ex-ante* Evaluation, applied before implementation to review the solutions being *proposed*.
- *Mid-term* Evaluation, reviews the results and impacts of the first few project years.
- *Ex-post* Evaluation, looks back after many years on the performance of an entire *programme*.

- Follow-up and monitoring studies
- Major obstacles and drawbacks, success and failure factors
- Effectiveness and success of the NTI planning practices

2.7 Monitoring System

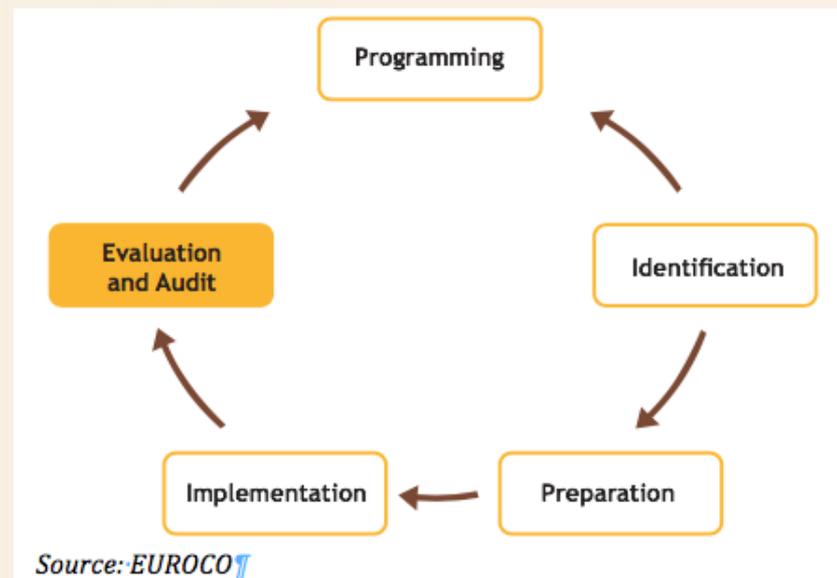
Evaluation is about *self-improvement*

The process is meant to be a leaning one for the *project owner*

When there is a stronger sense of ownership of the intellectual *outcome of the process*, it is more likely that stakeholders will act on the recommendations

Project cycle management ...

... is about self-improvement

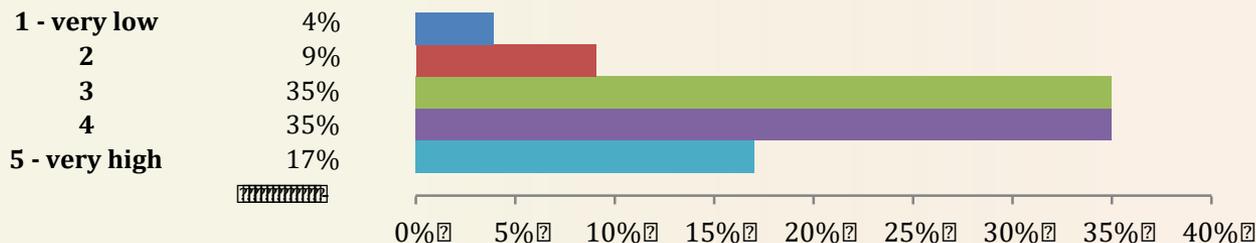


2.7 Monitoring System

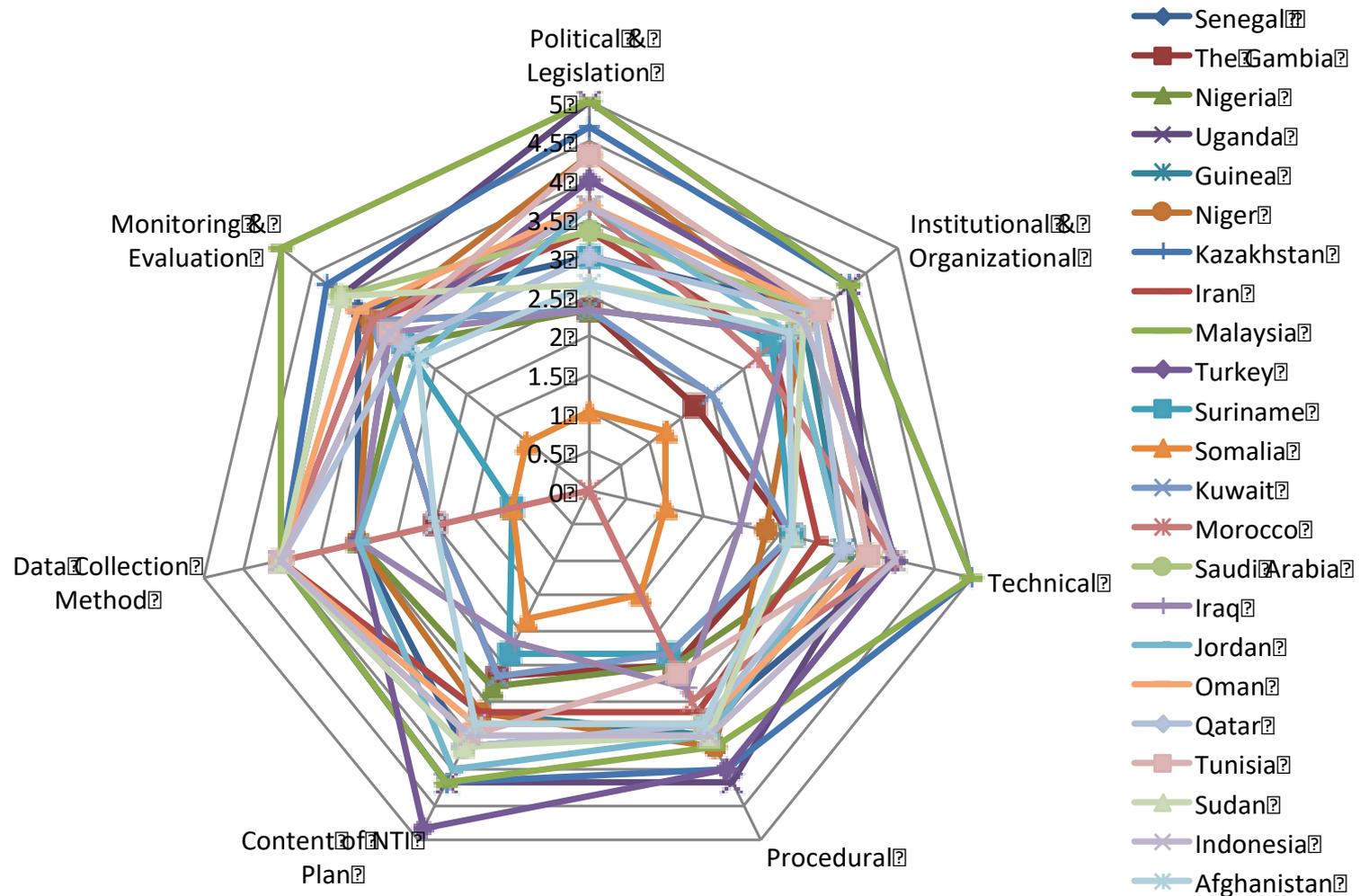
Criteria	Measurement of the Criteria	Scoring
Relevance	Is the rationale for the intervention still adequate (priority and validity)?	Use the Likert scale 1 - Not relevant or aligned to policy any more: 5 - Highly relevant and fully aligned to policy. Average scores for all parameters
Efficiency	Has the project been cost-effective? Has implementing the intervention/s been as expected?	<10% of targets score 5, i.e. of budget, time line or km planned If > 100% score 1. Average score for all efficiency attributes to provide the total score.
Effectiveness	Have the project goals / results expected being achieved?	Use Likert Scale: If meeting achieving result score 5 if not 1. Average for all results
Sustainability	Are these results able to be obtained over time, are they likely to endure?	If budget, resources and capacity adequate score 5: if not at all score 1... scale in between. Average for all attributes
Wider Impacts	Has the intervention positively influenced cross cutting issues?	Use Likert scale, strongly agree that project has created wider impact 5: strongly disagree that it has not 1. Average for all impacts

2.7 Monitoring System in OIC

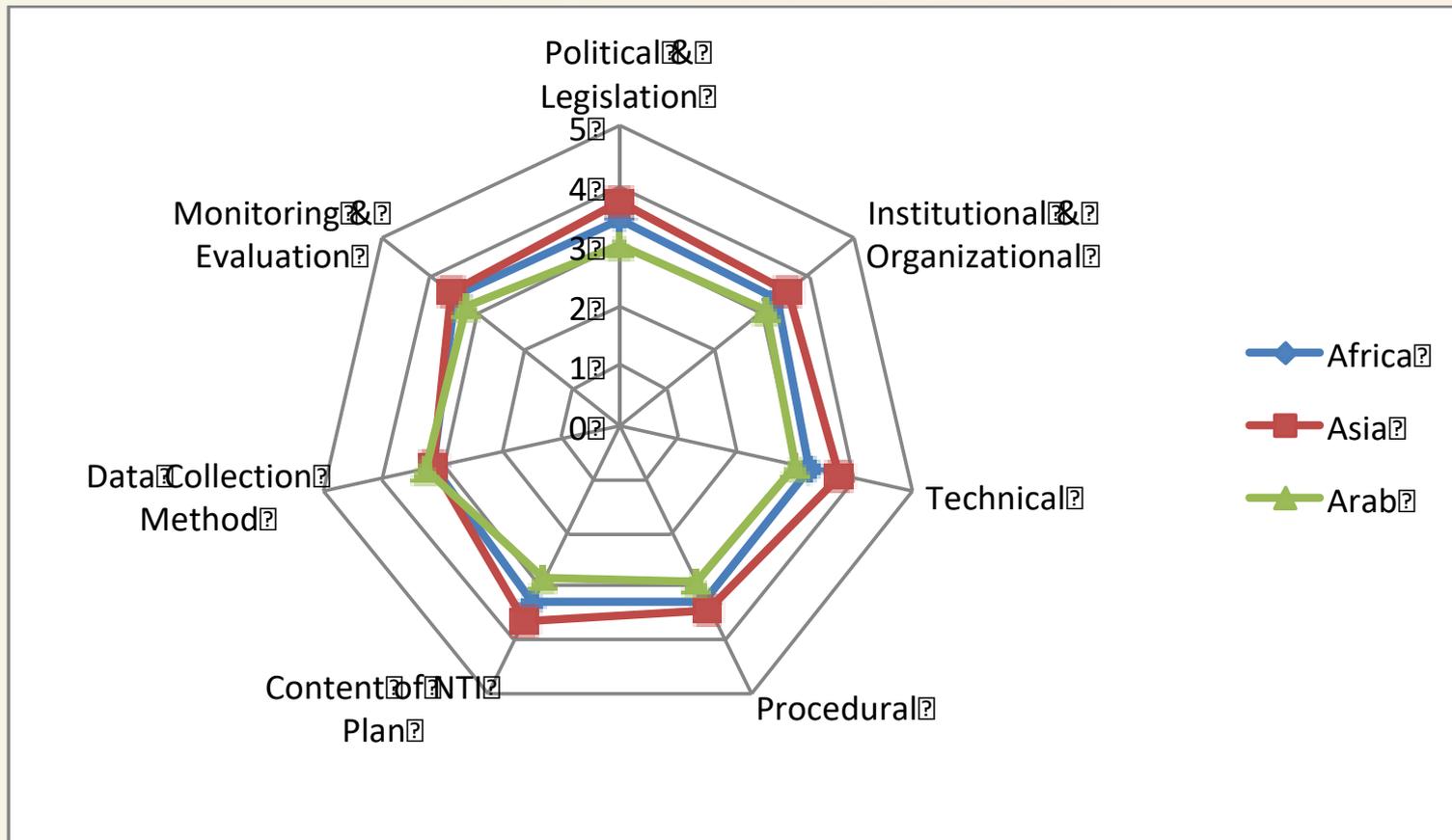
- 87% of the surveyed OIC Member States believe *improvement* in the monitoring and evaluation system is needed
- 50% of surveyed academics them are unsure whether the *evaluation process* in their countries was working well
- 38% of the surveyed academics believed that plan *implementation* was efficient.
- *Monitoring* is being implemented more than evaluation.
- In some countries the monitoring process is coordinated by the ministry who developed the NTI plan, while in other countries it is done by a separate agency.



3. NTI Planning Practices in 23 OIC Member States



3. NTI Planning Practices in 23 OIC Member States



Thank you for listening

Any Questions?