

The Scan-ICT-2: Methodology -

Demonstrating the Component Features of the Tool Kit

Professor Clement Dzidonu

International Institute for Information Technology (INIIT)

www.iniit.com

www.scan-ict.org

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Introduction: On the Tool Kit

- The IS/ICT4D Tool Kit holistically addressed the 'which indicators'' question in terms of: which indicators to develop to:
- guide the ICT4D policy formulation and implementation process [*Category-1 ICT4D Indicators – Baseline Indicators (capacity, usage indicators)*]
- monitor, assess and measure the impact of the policy implementation process to establish the extent to which the **goal** to move to an IKE (developing the information society and economy) is being achieved [*Category-2 ICT4D Indicators - Indicators for Assessing Progress towards the development of the IKE (capacity, usage indicators)*]
- monitor, assess and measure the impact of the policy implementation process on households, businesses and government processes and service delivery [*Category-3 ICT4D Indicators – Indicators for Monitoring, Assessing, Evaluating the impact of the development of the IS/ICT4D (transformation 'impact' indicators)*]

Framework A: Baseline Indicators for Guiding the ICT4D Policy and Plan Development Process

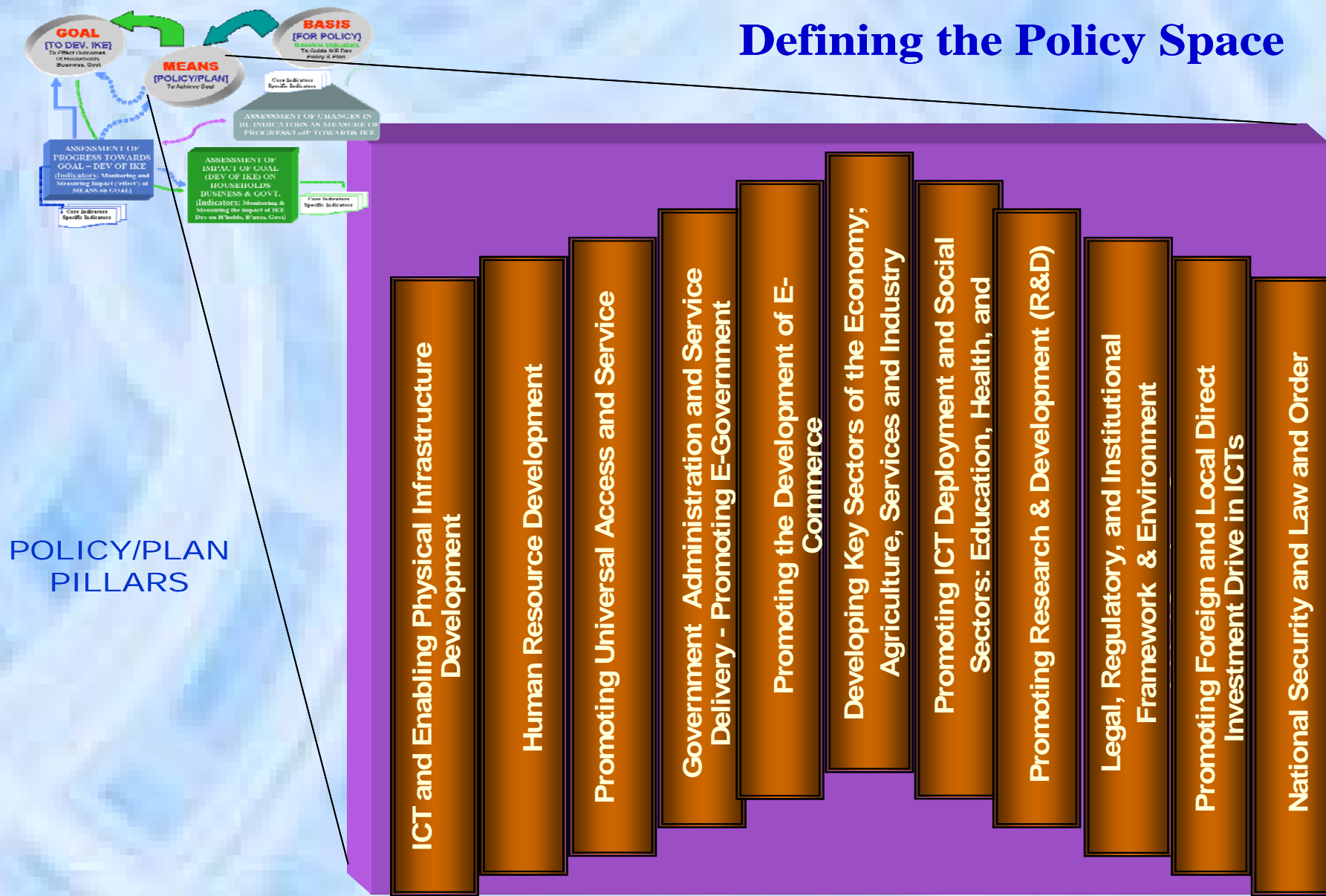
(Illustrating Core Requirement 1 Features of the Tool Kit)

- The ICT4D Baseline Study framework described in **Appendix B** provides a comprehensive framework to:
 - guide African countries in the identification and the compilation of relevant data on key ICT and socio-economic indicators within the economy and society
 - to serve as a basis for crystallizing their ICT4D/NICI policy initiatives as well as for making projections and setting targets within the corresponding ICT4D plans.
- The incorporation of ICT4D-related indicators on key sectors of the economy into the Baseline Study provides a basis for:
 - the integration of these indicators into national statistical systems – which by tradition classify information in social and economic indicators in terms of key sectors.

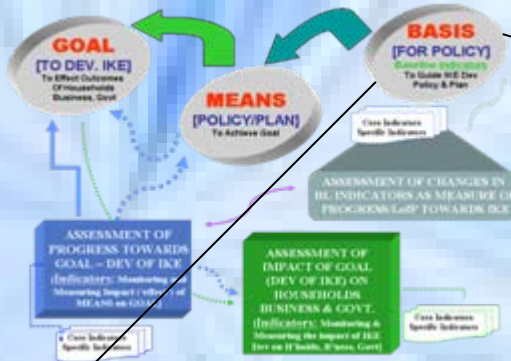
- The key sectors of the economy that could be targeted as part of the Baseline Study include
 - ICT sector/industry; Services, Industry and Commerce, Agriculture, Education, Health, and Government and public sector.
- Also for inclusion in the Baseline study are indicators to measure the status of the deployment and exploitation of ICTs to implement broad application areas like:
 - e-government, e-commerce and business, e-education, e-health and telemedicine applications among others.
- Note: The aim of the Baseline Study is not to conduct a comprehensive national survey within the economy and society but rather to carry-out a focused study concentrating on establishing the *status* [*capacity, usage*] of a number of key ICT4D indicators as they relate to key sectors of the economy.
- Note: The Baseline Study is not necessary a e-readiness study

Can demonstrated the Baseline indicators in terms of the ICT4D policy focus areas or pillars of most African countries involved in the NICI/ICT4D Process

Defining the Policy Space



The 'BASIS': Baseline Indicators to Guide Policy/Plan Dev.



ICT Infrastructure Development

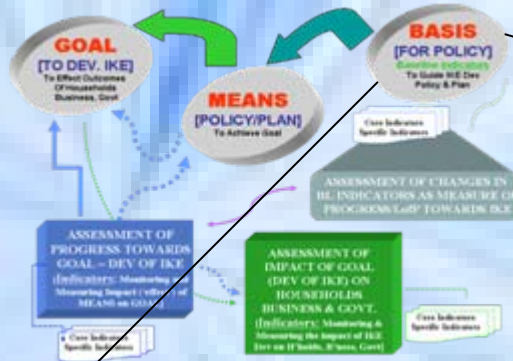
Indicators on the level of deployment and the geographical spread of ICT infrastructure:

- Telecommunication infrastructure (fixed line, mobile, satellite, national backbone infrastructure); communications and computer networks infrastructure;
- Internet Infrastructure and International and Local Bandwidth,
- Broadcasting infrastructure (radio and TV);
- Transport infrastructure, Power infrastructure

Example Baseline Indicators

- Main tel lines per 100 inhabitants (urban vrs. rural)
- Mobile Subscribers per 100 inhabitants (urban vrs. rural)
- No. of Internet Subscribers per 100 inhats (urban vrs. rural)
- No. of PCs per 100 inhabitants (urban vrs. rural)
- Mobile Subscriber as % total Tel Subscribers
- Mobile Subscriber as % total Tel Subscribers
- Long-Haul Internet Bandwidth
- No. of Internet Hosts
- Radios per 1000 inhabitants
- TVs per 1000 inhabitants

The 'BASIS': Baseline Indicators to Guide Policy/Plan Dev.



Human Resource Development

Indicators on ICT Human Resource Capacity; Human Resource Capacity in key Skill Areas; Human Resource Capacity in Key Sectors of the Economy: Agriculture, Services and Industry

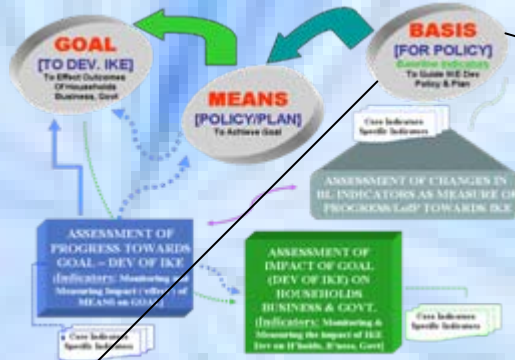
Indicators on the Human Resource Development Capacity of the Universities, Colleges and Other HRD Institutions and Establishments; Research and R&D Human Resource Capacity.

Indicators on the supply and demand of human resources in key technical, managerial and professional skill areas across all sectors

Example Baseline Indicators

- Total Supply and Demand of ICT Skills: (Programmers/ Software/System Developers/Analysts, Computer Scientists, Telecomm/ Network Engineers/Technicians etc)
- Level of Employment in the ICT industry (in absolute terms and % of total workforce (and gender distribution in terms of ICT Skills/Employment)
- Salary of ICT professionals by type of ICT Skill/ Employment
- Number of universities and colleges offering ICT programs

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Promoting Universal Access and Service

Indicators on the spread of ICTs (computers, telecom network and services, Internet) within the society and community;

Indicators on the penetration of ICT services and resources within the community and society;

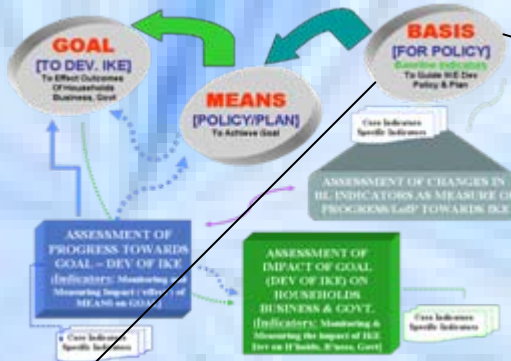
Indicators on the level and degree of exploitation of ICTs with the economy and society

Indicators on the degree and level of deployment of ICT infrastructure and services in rural communities

Example Baseline Indicators

- No. per 1000 inhabitants (within 5 km/walking distance) proximity to an Tel. Access Facility (IAF)
- No. per 1000 inhabitants (within 5 km/walking distance) proximity to an Internet Access Facility (IAF)
- Number of telecenters/comms centers per 1000 inhabitants
- Number of Public Phones per 1000 inhabitants (rural vrs. urban)
- Tel./Internet Access Charges [Tel/Internet Connection Charge, Monthly Tel/Internet Subscription rate, Fixed Line/Mobile Tel Tariffs: 3 minutes Local Call, Fixed Line/Mobile Tel Tariffs: Subscription as % GDP per capita]

The 'BASIS': Baseline Indicators to Guide Policy/Plan Dev.



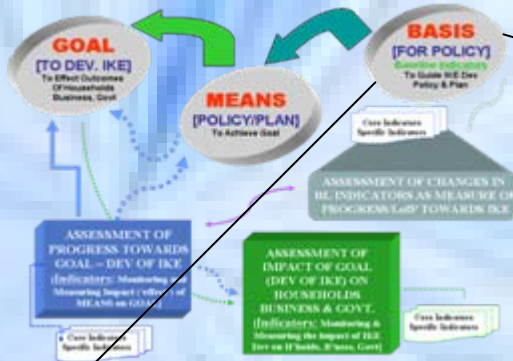
Government Administration and Service Delivery – E-Government

Indicators on the degree and level of: the deployment and exploitation of ICTs as well as the deployment and implementation of e-government systems and initiatives within Government Ministries, Department, and Public Agencies and Establishments.

Example Baseline Indicators

- No. and Percent of Govt. MDAs with Internet Connection
- No and Percent of Govt. MDAs with corporate networks
- No. and Percent of Govt. MDAs with Web Sites
- Percent of Govt MDA that implement E-Gov Systems (e.g. Back office systems etc)
- Percent of Govt MDA providing services online
- Percent of ICT personnel (per total staff) in Govt MDAs
- Percent Expenditure on ICTs (per total expenditure) in Govt MDAs

The 'BASIS': Baseline Indicators to Guide Policy/Plan Dev.



Promoting the Development of Electronic Commerce

Indicators on the degree and level of the deployment and exploitation of ICTs within private sector organizations in the services, and industrial sector

Indicators on the diffusion of ICTs and the Internet within the services, and industrial sector.

Indicators on the extent of the development and production of ICT products (software development, computer and communication devices) and the provision of ICT services (telecom services, Internet services, web and content dev. services, ICT equipment maintenance and repair services etc) within the economy

Indicators on the degree and the extent of the provision of e-commerce facilitation services (banking services, merchant services, fulfillment house services, etc)

Example Baseline Indicators

- Percent of Establishment placing orders over the Internet: Agric Sector
- Percent of Business placing orders over the Internet: Service Sector
- Percent of Firms placing orders over the Internet: Industrial Sector

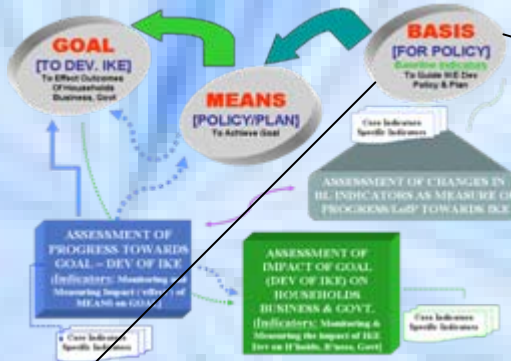
Indicators Cont.....

- Percent of Establishment receiving orders over the Internet: Agric Sector
- Percent of Business receiving orders over the Internet: Service Sector
- Percent of Firms receiving orders over the Internet: Industrial Sector

- Percentage of local Banks proving online banking services
- Percentage of population with credit cards
- Software Exports as percentage of total non-traditional exports
- Percent of locally sold ICT goods and services produced locally

- Indicator to gauge the e-commerce legislative enabling environment
- Country Global competitiveness index
- Business Facilitation Index
- Digital Divide Index

The 'BASIS': Baseline Indicators to Guide Policy/Plan Dev.



Developing Key Sectors of the Economy: Agric, Services & Industry

Indicators on the level of deployment and the degree of exploitation and utilization of ICTs within the key sectors of the economy: services, industry and agricultural sectors

Indicators on the spread of ICTs within the key sectors of the economy: services, industry and agric sectors

Indicators on the demand and supply of ICT-skills within the key sectors: services, industry & agric sectors

Indicators on the level of ICT-related investment in key sectors of the economy: services, industry and agricultural sectors

Indicators on the growth rate, productivity levels of each of the key sectors of the economy

Example Baseline Indicators

- Indicator to measure ICT contribution GDP/GNI Growth
- Indicator to measure ICT contribution Agriculture Value Added
- Indicator to measure ICT contribution Services Value Added
- Indicator to measure ICT contribution Industrial Value Added
- Indicator to measure the contribution to Export Earnings
- ICT FDI (as percent of total FDI inflow)
- Avrg size (no. of emplys) of ICT firms
- Percent of ICT Personal (per Total staff): Agric Sector
- Percent of ICT Personal (per Total staff): Service Sector
- Percent of ICT Personal (per Total staff): Industrial Sector

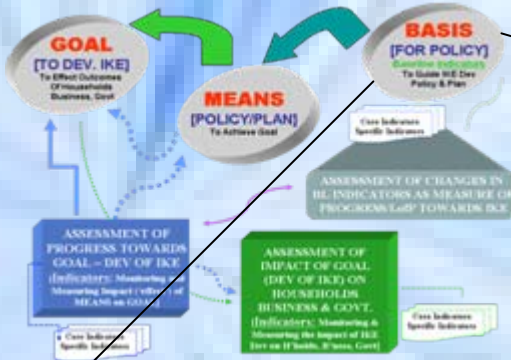
Indicators Cont.....

- Percent of Staff/Workers that use PCs: Agric Sector
- Percent of Staff/Workers that use PCs: Service Sector
- Percent of Staff/Workers that use PCs: Industrial Sector

- Percent of Establishments with Corporate Network: Agric Sector
- Percent of Business with Corporate Network: Service Sector
- Percent of Firms with Corporate Network: Industrial Sector
 - Percent of Staff/Workers that use Internet: Agric Sector
 - Percent of Staff/Workers that use Internet: Service Sector
 - Percent of Staff/Workers that use Internet: Industrial Sector

- Percent of Establishments with Web Site: Agric Sector
- Percent of Business with Web Site that use PCs: Service Sector
- Percent of Firms with Web site: Industrial Sector

The 'BASIS': Baseline Indicators to Guide Policy/Plan Dev.



Promoting ICTs Deployment in Social Sectors: Education, Health, and Community

Indicators of the level of diffusion and level of utilization of ICTs (computers, Internet etc) within the educational, health sectors and in the community

Indicators to measure the degree of the deployment, penetration and the exploitation of ICTs in schools

Indicators on community access to ICT services (rural vrs urban)

Access and connectivity indicators on telecom and communication services: telephone and Internet services

Indicators on gender-related ICT access and usage statistics

Indicators on the level of ICT expenditure and investment in the educational and health sectors

Example Baseline Indicators

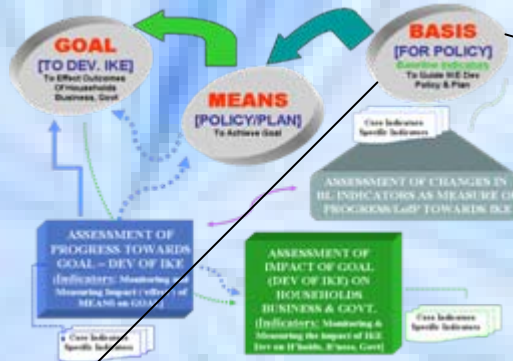
- Percent of schools with PCs (urban vrs rural)
- Percent of schools with tel (fixed/mobile) (urban vrs rural)
- Percent of school with Internet connectivity (urban vrs rural)
- Percent of schools with electricity (urban vrs. rural)
- Percent of schools with Web Sites (urban vrs rural)
- Percent of schools implementing schoolnet (urban vrs rural)

Indicators Cont.....

- Average computer to pupil ratio (urban vrs rural)
- Percent ICT expenditure as per total school budget (urban vrs rural)
- No. of ICT literate Teachers per school (urban vrs. rural)
- ICT literate Teachers as percent of total no. of Teachers per school (urban vrs. rural)

- Percent of hospitals/health centers with PCs (urban vrs rural)
- Percent of hospitals/health centers with Internet connectivity (urban vrs rural)
- Percent of hospitals/health centers with Web Sites (urban vrs rural)
- Percent of schools implementing telemedicine (urban vrs rural)
- Average computer to doctor/medical personnel ratio (urban vrs rural)

The 'BASIS': Baseline Indicators to Guide Policy/Plan Dev.



Promoting Research and Development

Indicators to measure to research and R&D human resource base

Indicators to measure national expenditure and investment in research and R&D

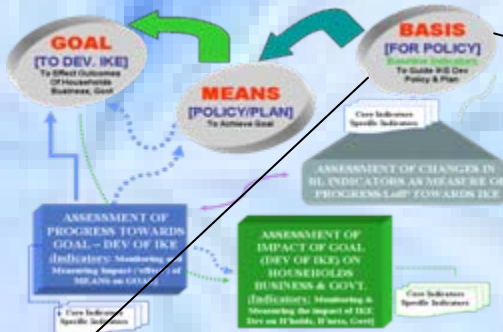
Indicators on the volume and value of research and R&D output

Indicators on ICT product and services development related research and R&D work

Example Baseline Indicators

- Expenditure on R&D as percent of GDP
- Number of Scientists and Engineers per 1000 inhabitants
- High tech Exports as percent of Total Exports
- Industry R&D Expenditure as percent of total company budgetary expenditure
- Number of industrial patent per 1000 inhabitants
- Number of Research Degree Recipient per annum

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Legal, Regulatory and Institutional Framework and Environment

Information on the existing legal and regulatory framework

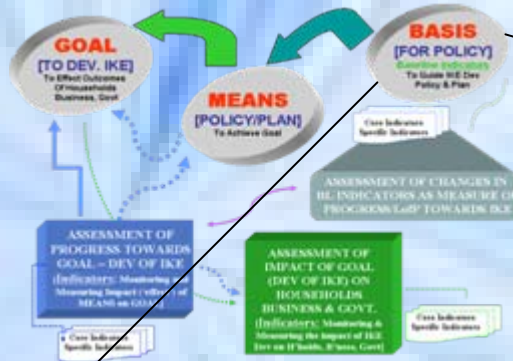
Information on types of cyber laws enacted

Information on legislative instruments and provisions put in place to facilitate the ICT4D process in the country

Example Baseline Indicators

- Types of ICT4D legal and regulatory instruments and legislations passed, promulgated
- Measure of the impact of the legal and regulatory environment on the ICT industry
- Number and types of legal and regulatory institutions relevant to the ICT4D process and activities

The 'BASIS': Baseline Indicators to Guide Policy/Plan Dev.



National Security and Law and Order

Information of e-security laws and provisions put in place to prevent and address cyber-crime related activities

Indicators on the level deployment and exploitation of ICTs within the security agencies

Indicators on the ICT skill base of the security agencies

Example Baseline Indicators

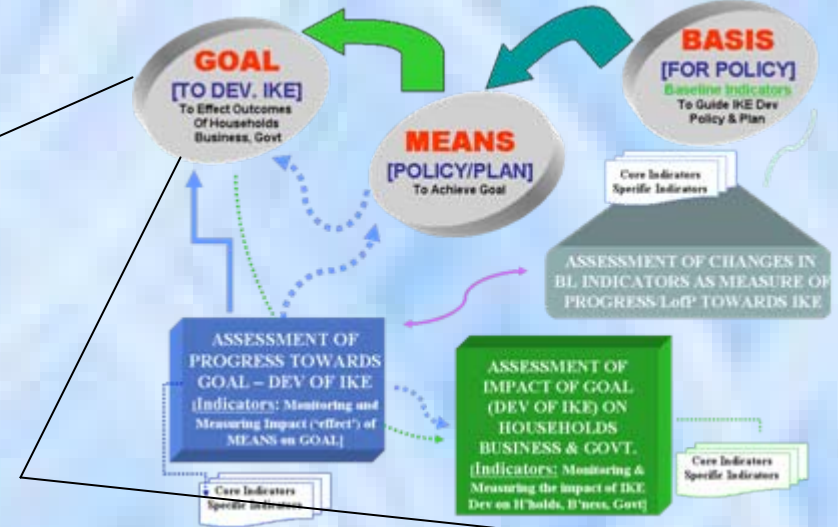
- Types and the number of cyber security laws and legislations passed or promulgated
- Measure of the penetration of ICTs within the security agencies
- The level and the types of ICT human resources within the security agencies
- The level of deployment of security systems with the public and private sector to combat cyber crime
- The level of awareness in the country on ICT-related security issues

Framework B: The Development of IS/ICT4D (Capacity, Usage) Indicators to Measure Progress Towards Achieving the IS/IKE Goal

(Illustrating Core Requirement 2 Features of the Tool Kit)

- Core requirement 2 stipulates the need for a framework for the identification of suitable indicators to support the monitoring and evaluation of progress towards the development of the IS/IKE
- A review of the ICT4D process in African countries did show that for the majority of them, the ultimate goal is not only to develop their information society but also to transform their industrially weak, subsistence agriculture based economies into an IKE
- Suitable ICT4D indicators can be developed to measure progress towards achieving the IKE goal

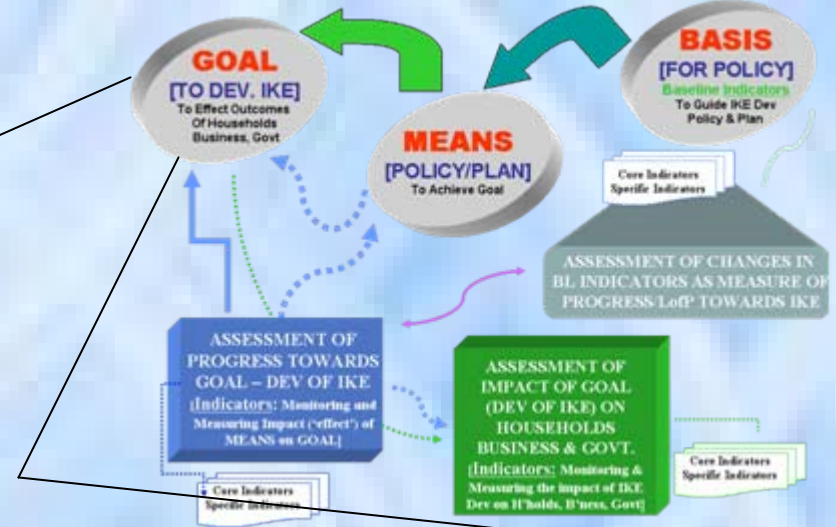
DEFINING THE IKE GOAL SPACE



- A high income economy dominated by trading in ICT products and services
- An economy characterized by a large commercial services sector with a reasonably large and vibrant ICT services sector and industry
- An economy characterized by a technology-based knowledge-driven industrial sector
- An economy with a globally competitive industrial and services sector which are to a large extent driven by cutting-edge R&D encompassing basic and applied industrial and product development.
- An economy based on a rich pool of highly skilled human resources in critical skill areas relevant for developing and maintaining a competitive edge on the global market

DEFINING THE IKE GOAL SPACE

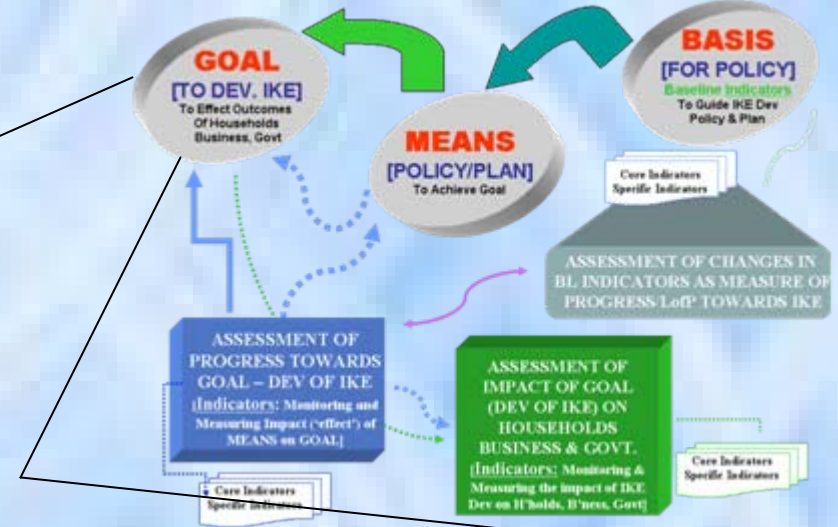
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- An economy in which the majority of the working population are either directly or indirectly involved in information and communications related activities
- An economy with a modern, efficient and competitive agricultural sector
- An economy characterized by a wide-spread deployment and exploitation of ICTs within the society to support the delivery of health, education, government and social services
- An economy characterized by a modern educational system within which ICTs are widely deployed to facilitate the delivery of educational services at all levels of the educational system
- An economy in which a reasonable large proportion of the population have access to information and communications technology products and services

DEFINING THE IKE GOAL SPACE

cont.



- An economy in which the provision and delivery of goods and services of the key sectors of the economy are to a large extent facilitated by information and communications technologies
- An economy in which the provision and delivery of services by government and its administrative machinery are to a large extent facilitated by information and communications technologies
- An economy based on an advanced and reliable national information and communications infrastructure
- An economy based on an advanced and reliable national information and communications infrastructure
- An economy based on a literate society with a high proportion of computer literates

- Framework B serves as a key feature of the Tool Kit aimed at using specific set of IS/ICT4D indicators (defined in terms of the IKE characteristics) to.....
 - assess and measure the progress of each Africa country towards achieving the goal of developing their respective information society and for that matter their information and knowledge based economy.
- These indicators are designed to monitor the implementation of the ICT4D policy initiatives with a view to ensure that targets set as per the development of the IKE are being met and to
 - establish the extent to which the policies and corresponding action plans are actually achieving the desired and intended policy objectives of developing the IS/IKE
- The proposed *framework* identify for each of these features of IKE a number of indicative indicators that can be used to measure progress towards the achievement of each of the IKE sub-goals (IKE characteristics)



The ICT4D Indicators Framework

Measuring Progress towards the development of the IKE (**GOAL**) through the implementation of ICT4D Policies/Plans (**MEANS**)

IKE Feature/ Sub-Goal ' GOAL '	Relevant Policy Pillars ' MEANS '	Indicative Broad (Capacity, Usage) Indicators for Measuring the Development of (IKE)
<p>A high income economy dominated by trading in ICT products and services</p>	<p>ICT Infrastructure Development</p> <p>Human Resource Development</p> <p>Promoting Universal Access and Service</p> <p>Promoting Electronic Commerce and the Development of the Private Sector</p> <p>Developing Key Sectors of the Economy: Agriculture, Services and the ICT Industry</p> <p>Promoting Research and Development</p>	<p>Indicators to monitor and measure economic growth, productivity GDP and GNI attributable to ICT4D initiatives</p> <p>Indicators to measure on a sector-by-sector basis the social, economic and infrastructural impact of the deployment and exploitation of ICTs within the key sectors of the economy: services, industry and agricultural sectors</p> <p>Indicators to measure the contribution of ICTs to growth and productivity within each of the key sectors of the economy: services, industry and agricultural sectors</p> <p>Indicators to measure the extent to which the deployment and exploitation of ICTs has contributed to growth and improvements in sectorial contribution to GDP and GNI</p> <p>Indicators to measure the overall impact of the development, deployment and the exploitation of ICTs within the economy on: investments, economic growth, agricultural, and industrial productivity and to GDP and GNI</p>

IKE Feature/ Sub-Goal 'GOAL'	Relevant Policy Pillars 'MEANS'	Indicative Broad (Capacity, Usage) Indicators for Measuring the Development of (IKE)
<p>An economy characterized by a large commercial services sector with a reasonably large and vibrant ICT services sector and industry</p>	<p>ICT Infrastructure Development</p> <p>Human Resource Development</p> <p>Promoting Universal Access and Service</p> <p>Promoting Electronic Commerce and the Development of the Private Sector</p> <p>Developing Key Sectors of the Economy: Agriculture, Services and the ICT Industry</p> <p>Promoting R&D</p> <p>Legal, Regulatory and Institutional Framework and Environment</p>	<p>Indicators to measure the contribution of the ICT production and services sector to economic growth, GDP and GNI</p> <p>Indicators to monitor and measure the size of the commercial services sub-sector activities</p>

IKE Feature/ Sub-Goal ‘GOAL’	Relevant Policy Pillars ‘MEANS’	Indicative Broad (Capacity, Usage) Indicators for Measuring the Development of (IKE)
<p>An economy characterized by a technology-based knowledge-driven industrial sector</p>	<p>ICT Infrastructure Development</p> <p>Human Resource Development</p> <p>Promoting Universal Access and Service</p> <p>Promoting E-Commerce and the Development of the Private Sector</p> <p>Developing Key Sectors of the Economy: Agriculture, Services and the ICT Industry</p> <p>Promoting R&D</p> <p>Legal, Regulatory and Institutional Framework and Environment</p>	<p>Indicators to monitor and assess the knowledge-based activities of the industrial sector</p> <p>Indicators to monitor, assesses and measure the contribution of knowledge-based industrial sub-sector activities to economic growth, GDP and GNI</p>

IKE Feature/ Sub-Goal 'GOAL'	Relevant Policy Pillars 'MEANS'	Indicative Broad (Capacity, Usage) Indicators for Measuring the Development of (IKE)
<p>An economy with a globally competitive industrial and services sector which are to a large extent driven by cutting-edge R&D encompassing basic and applied industrial and product development.</p>	<p>ICT Infrastructure Dev</p> <p>Human Resource Dev</p> <p>Promoting Universal Access and Service</p> <p>Promoting E-Commerce and the Development of the Private Sector</p> <p>Developing Key Sectors of the Economy: Agriculture, Services and the ICT Industry</p> <p>Promoting R&D</p> <p>Legal, Regulatory and Institutional Framework and Environment</p>	<p>Indicators to assess R&D expenditure per million of population</p> <p>Indicators to assess the impact of R&D on productivity in the industrial and services sector</p> <p>Indicators to measure the size of high tech exports attributable to R&D</p> <p>Indicators to measure the contribution of research and R&D on economic growth, GDP and GNI</p> <p>Indicators to measure the modernization-coefficient of the educational institutions as a result of the deployment and exploitation of ICTs</p> <p>Indicators to measure the research and R&D output of higher educational institutions and research institutes</p>

IKE Feature/Sub-Goal 'GOAL'	Relevant Policy Pillars 'MEANS'	Indicative Broad (Capacity, Usage) Indicators for Measuring the Development of (IKE)
<p>An economy based on a rich pool of highly skilled human resources in critical skill areas relevant for developing and maintaining a competitive edge on the global market</p>	<p>Human Resource Dev</p> <p>Promoting Universal Access and Service</p> <p>Government Administration and Service Delivery – E-Government</p> <p>Promoting E-Commerce and the Development of the Private Sector</p> <p>Promoting ICTs Deployment in Social Sectors: Education, Health, and Community</p> <p>Promoting R&D</p>	<p>Human resource capacity indicators</p> <p>Indicators to measure the quality of human resources</p> <p>Indicators to assess the critical nature of various skills to the IKE</p> <p>Indicators to assess the critical mass requirement of various IKE skills</p> <p>Indicators to measure the extent of the improvements in the level of ICT Human Resource Capacity; Professional Level Human Resource Capacity in key Skill Areas; Human Resource Capacity and Levels in Key Sectors of the Economy: Agriculture, Services and Industry</p> <p>Indicators to measure the extent of the improvements in the Human Resource Development Capacity of the Universities, Colleges and Other Key HRD Institutions and Establishment; Research and R&D Human Resource Capacity of the Nation.</p>

IKE Feature/ Sub-Goal 'GOAL'	Relevant Policy Pillars 'MEANS'	Indicative Broad (Capacity, Usage) Indicators for Measuring the Dev (IKE)
<p>An economy in which the majority of the working population are either directly or indirectly involved in information and communications related activities</p>	<p>ICT Infrastructure Development</p> <p>Human Resource Development</p> <p>Promoting Universal Access and Service</p> <p>Government Administration and Service Delivery – E-Government</p> <p>Promoting E-Commerce and the Development of the Private Sector</p> <p>Developing Key Sectors of the Economy: Agriculture, Services and the ICT Industry</p> <p>Promoting ICTs Deployment in Social Sectors: Education, Health, and Community</p> <p>Promoting R & D</p> <p>Legal, Regulatory and Institutional Framework and Environment</p>	<p>Indicators [Indexes] to measure the proportion of the working population involved in information and communication related activities of the economy</p> <p>Indicators to measure the gender composition of the working population involved in information and communication related activities of the economy</p> <p>Indicators to measure the income levels of those working in or engaged in information and communication related industries or activities</p>

IKE Feature/ Sub-Goal 'GOAL'	Relevant Policy Pillars 'MEANS'	Indicative Broad (Capacity, Usage) Indicators for Measuring the Development of (IKE)
<p>An economy with a modern, efficient and competitive agricultural sector</p>	<p>ICT Infrastructure Development</p> <p>Promoting Universal Access and Service</p> <p>Developing Key Sectors of the Economy: Agriculture, Services and the ICT Industry</p>	<p>Indicators to measure the extent of mechanization of agricultural production activities</p> <p>Indicators to measure the extent of commercialization of agricultural activities</p> <p>Indicators to measure expenditure and investment in agricultural research and R&D</p> <p>Indicators on the degree of deployment and exploitation of ICTs to support agricultural activities (production, processing, distribution and marketing)</p> <p>Indicators to measure the contribution of ICTs to growth and productivity within each of the agricultural sector</p> <p>Indicators to measure the extend to which the deployment and exploitation of ICTs has contributed to growth and improvements in agriculture sector contribution to GDP and GNI</p>

IKE Feature/ Sub-Goal 'GOAL'	Relevant Policy Pillars 'MEANS'	Indicative Broad (Capacity, Usage) Indicators for Measuring the Development of (IKE)
<p>An economy characterized by a wide-spread deployment and exploitation of ICTs within the society to support the delivery of health, education, government and social services</p>	<p>ICT Infrastructure Development</p> <p>Human Resource Development</p> <p>Promoting Universal Access and Service Government Administration and Service Delivery – E-Government</p> <p>Promoting ICTs Deployment in Social Sectors: Education, Health, and Community</p> <p>Promoting Research and Development</p> <p>Legal, Regulatory and Institutional Framework and Environment</p>	<p>Indicators to measure the extent of the deployment and the spread of ICTs within the community</p> <p>Indicators to monitor and measure the degree of deployment, and exploitation of ICTs within the Educational, and Health sector and institutions</p> <p>Indicators to monitor and measure the degree of adoption of ICTs to support operations and activities within government and public sector institutions</p> <p>Indicators to monitor and measure the degree of diffusion of ICTs within education, health and government institutions</p> <p>Indicators to measure the extent of the spread of ICTs (computers, telecom network and services, Internet) within the society and community; the penetration of ICT services and resources within the community and society; the level and degree of exploitation of ICTs with the economy and society at large; the degree and level of deployment of ICT infrastructure and services in rural communities</p>

IKE Feature/ Sub-Goal 'GOAL'	Relevant Policy Pillars 'MEANS'	Indicative Broad (Capacity, Usage) Indicators for Measuring the Development of (IKE)
		<p>Indicators to measure the extent and the level of access to telecommunications and communications services within the social sectors of the economy</p> <p>Indicators to measure the level of community access and connectivity to ICT services and resources</p> <p>Indicators to measure the social and economic impact of ICTs households and communities</p> <p>Indicators to measure the social and economic impact of the deployment and exploitation of ICTs to support teaching and learning and research in the Universities and Colleges</p> <p>Indicators to measure the impact of the deployment of ICTs on educational, health and social services delivery</p> <p>Indicators to measure the extent of the deployment of ICTs within the community at large (rural vrs. urban)</p> <p>Indicators to measure the social and economic impact of the within and between communities and gender groups digital divide</p> <p>Indicators to measure of the level and the extent of ICT awareness in the society</p>

IKE Feature/Sub-Goal ‘GOAL’	Relevant Policy Pillars ‘MEANS’	Indicative Broad (Capacity, Usage) Indicators for Measuring the Development of (IKE)
<p>An economy characterized by a modern educational system within which ICTs are widely deployed to facilitate the delivery of educational services at all levels of the educational system</p>	<p>ICT Infrastructure Development</p> <p>Human Resource Development</p> <p>Promoting Universal Access and Service</p> <p>Promoting ICTs Deployment in Social Sectors: Education, Health, and Community</p> <p>Legal, Regulatory and Institutional Framework and Environment</p>	<p>Indicators to measure the ICT adoption rate within the educational system</p> <p>Indicators to measure the degree of modernization within the educational system [Educational system modernization coefficients/indexes]</p> <p>Indicators to measure the extent of the penetration of ICTs within the educational system</p>

IKE Feature/ Sub-Goal 'GOAL'	Relevant Policy Pillars 'MEANS'	Indicative Broad (Capacity, Usage) Indicators for Measuring the Development of (IKE)
<p>An economy in which a reasonable large proportion of the population have access to information and communications technology products and services</p>	<p>ICT Infrastructure Development</p> <p>Promoting Universal Access and Service</p> <p>Government Administration and Service Delivery – E-Government</p> <p>Promoting E-Commerce and the Development of the Private Sector</p> <p>Promoting ICTs Deployment in Social Sectors: Education, Health, and Community</p> <p>Promoting Research and Development</p> <p>Legal, Regulatory and Institutional Framework and Environment</p>	<p>Indicators to measure the contribution of ICT products and services sector to GDP, GNI</p> <p>Indicators to monitor and measure household expenditure on ICT products and services</p> <p>Indicators to capture changes in consumption patterns of households</p>

IKE Feature/ Sub-Goal 'GOAL'	Relevant Policy Pillars 'MEANS'	Indicative Broad (Capacity, Usage) Indicators for Measuring the Development of (IKE)
<p>An economy in which the provision and delivery of goods and services of the key sectors of the economy are to a large extent facilitated by information and communications technologies</p>	<p>ICT Infrastructure Development</p> <p>Human Resource Development</p> <p>Promoting Universal Access and Service</p> <p>Government Administration and Service Delivery – E-Government</p> <p>Promoting E-Commerce and the Development of the Private Sector</p> <p>Developing Key Sectors of the Economy: Agriculture, Services and the ICT Industry</p> <p>Promoting R&D</p> <p>Legal, Regulatory and Institutional Framework and Environment</p>	<p>Indicators to measure the degree of the deployment of ICT infrastructure within the country</p> <p>Indicators to measure the level of Internet connectivity and usage within specific relevant sectors of the economy</p> <p>Indicators to assess the degree to which establishments within key sectors of the economy makes use of ICTs to facilitate the provision of services</p> <p>Indicators to measure the volume of the value or e-commerce and e-trade services and transactions (locally and internationally)</p> <p>Indicators to measure the contribution of the ICT services sector and industry to economic growth, and to GDP and GNI</p>

IKE Feature/ Sub-Goal 'GOAL'	Relevant Policy Pillars 'MEANS'	Indicative Broad (Capacity, Usage) Indicators for Measuring the Development of (IKE)
<p>An economy based on an advanced and reliable national information and communications infrastructure</p>	<p>ICT Infrastructure Development</p> <p>Promoting Universal Access and Service</p> <p>Promoting Research and Development</p> <p>Legal, Regulatory and Institutional Framework and Environment</p>	<p>Indicators monitor and measure the level and the spread of ICT infrastructure</p> <p>Indicators to measure the spread and density of various information and communication technologies within the society and communities</p> <p>Indicators to measure the extent of the deployment of communications and network systems and technologies within organizations and indicator</p> <p>Indicators to measure the diffusion rate of ICT infrastructure within key sectors of the economy</p> <p>Indicators on the extent of the development, deployment and utilization of ICT infrastructure: telecommunication infrastructure (fixed line, mobile, satellite, national backbone infrastructure); communications and computer networks infrastructure; Internet Infrastructure and Intentional and Local Bandwidth, Broadcasting infrastructure (radio and TV); Transport infrastructure, Power infrastructure</p> <p>Indicators on the impact of the legal and regulatory regime on the ICT4D policy and plan implementation activities and initiatives within the country.</p>

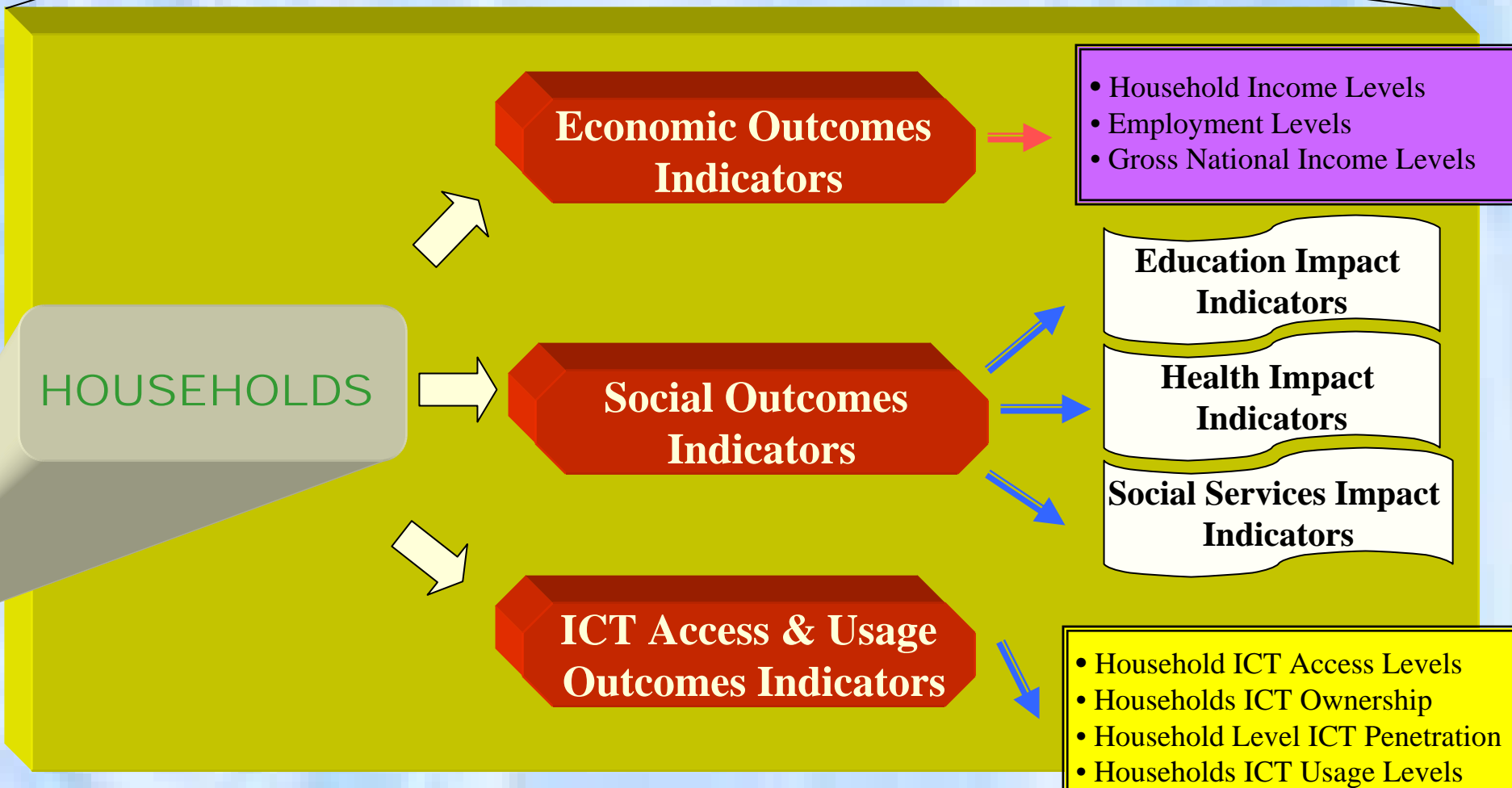
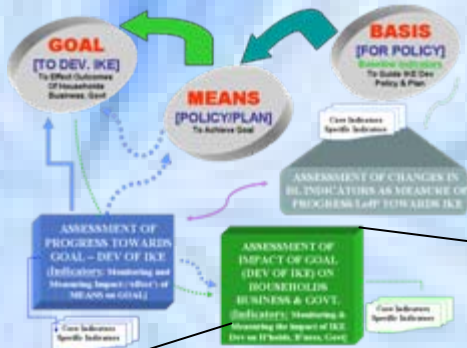
IKE Feature/Sub-Goal ‘GOAL’	Relevant Policy Pillars ‘MEANS’	Indicative Broad (Capacity, Usage) Indicators for Measuring the Development of (IKE)
<p>An economy based on a literate society with a high proportion of computer literates</p>	<p>ICT Infrastructure Development</p> <p>Human Resource Development</p> <p>Promoting Universal Access and Service</p>	<p>Indicators to measure the ICT literacy within the society</p> <p>Indicators to measure the level and the spread computer awareness within the country</p> <p>Indicators to measure the degree of adoption computer education and training within the educational system</p> <p>Indicators on computer-related skills and professional within the workforce</p>

Assessing and Measuring Targeted Impact of the Development of the IKE on the Outcomes of Households

The framework distinguishes between three types of *impact outcomes indicators* namely:

- *economic outcomes impact indicators*: For example indicators for measuring the impact of the development of the IKE on the level of households' incomes, employment levels etc.
- *social outcomes impact indicators*: For example, households health status indicators measuring the impact of the development of a specific aspect of the IKE (e.g. improving the health delivery system through the deployment and exploitation of ICTs) on the health status of say on rural households
- *ICT access and usage outcomes indicators*: For example, indicators for measuring the impact of the development of the IKE on households access to ICTs and the social and economic impact of improvements in access levels and spread of the technology.
 - Specific indicators could also be developed to measure the impact on specific sections of the society e.g. rural or underserved communities etc.

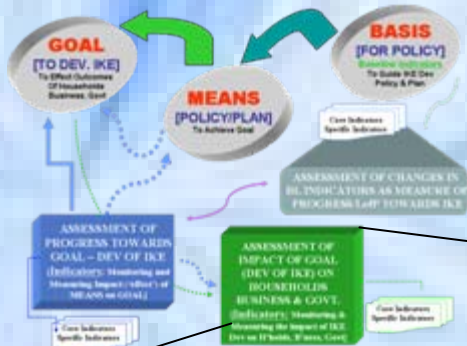
Assessing and Measuring Targeted Impact of the IKE: **Impact on Households**



Assessing and Measuring Targeted Impact of the Development of the IKE on the Outcomes of Businesses

- The framework identified two broad types of *impact outcomes indicators* in relation to measuring the impact of the development of the IKE on businesses and these are:
- *economic outcome impact indicators*: For example, indicators for measuring the impact of the development of the IKE on productivity levels within key sectors of the economy.
- *ICT access and usage outcomes indicators*: For example, indicators for measuring the level of computer penetration in a specific sub-sector of the economy.

Assessing and Measuring Targeted Impact of the IKE: **Impact on Businesses**



Economic Outcomes Indicators

- Productivity Levels
- Global Competitiveness Levels
- Gross National Income Levels
- FDI and Local Investment Level
- Profitability Levels

BUSINESSES

ICT Access & Usage Outcomes Indicators

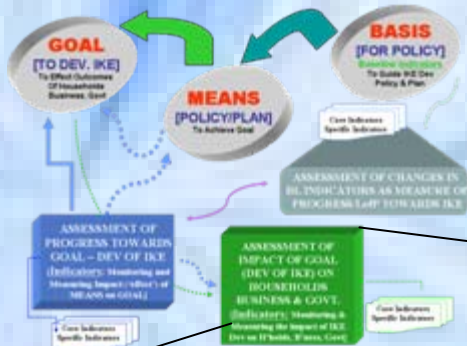
- Business ICT Access Levels
- Business ICT Ownership Levels
- Business Level of ICT Penetration
- Business ICT Deployment Levels
- Business ICT Production Levels
- Business ICT Usage Levels

Assessing and Measuring Targeted Impact of the Development of the IKE on the Outcomes of Government Systems and Operations

The framework distinguishes between two types of *impact outcomes indicators* namely:

- *performance outcomes impact indicators*: For example indicators for measuring the impact of the development of the IKE on the operational efficiency levels, service delivery levels etc of government agencies.
- *ICT access and usage outcomes indicators*: For example, indicators to measure the level of computer penetration, the level of ICT usage in government Ministries, Departments and Agencies (MDAs).

Assessing the Measuring Targeted Impact of the IKE: Impact on Government



Performance Outcomes Indicators

- Productivity Levels
- Operational Efficiency Levels
- Service Delivery Improvement Levels
- Reduction in Corruption Level
- Reduction in Inefficiency Levels
- Level of Computerization
- E-Gov Service Delivery Performance Index/Rating

GOVERNMENT

ICT Access & Usage Outcomes Indicators

- Govt. MDA ICT Access Levels
- Govt. MDA ICT Ownership Levels
- Govt. MDA Level of ICT Penetration
- Govt. MDA ICT Deployment Levels
- Govt. MDA ICT Production Levels
- Govt. MDA ICT Usage Levels

- Note: The use of specific indicators to assess and measure the impact of the development of the IKE on government systems and operations is important not only in terms of....
 - how government systems may or may not have improved as a result of progress towards the development of the IKE but also of interest is...
 - the indirect impact on households and businesses (for that matter the economy); since government systems and operations do have indirect impact on these other entities

Integrating and Implementing the Components of the Toolkit

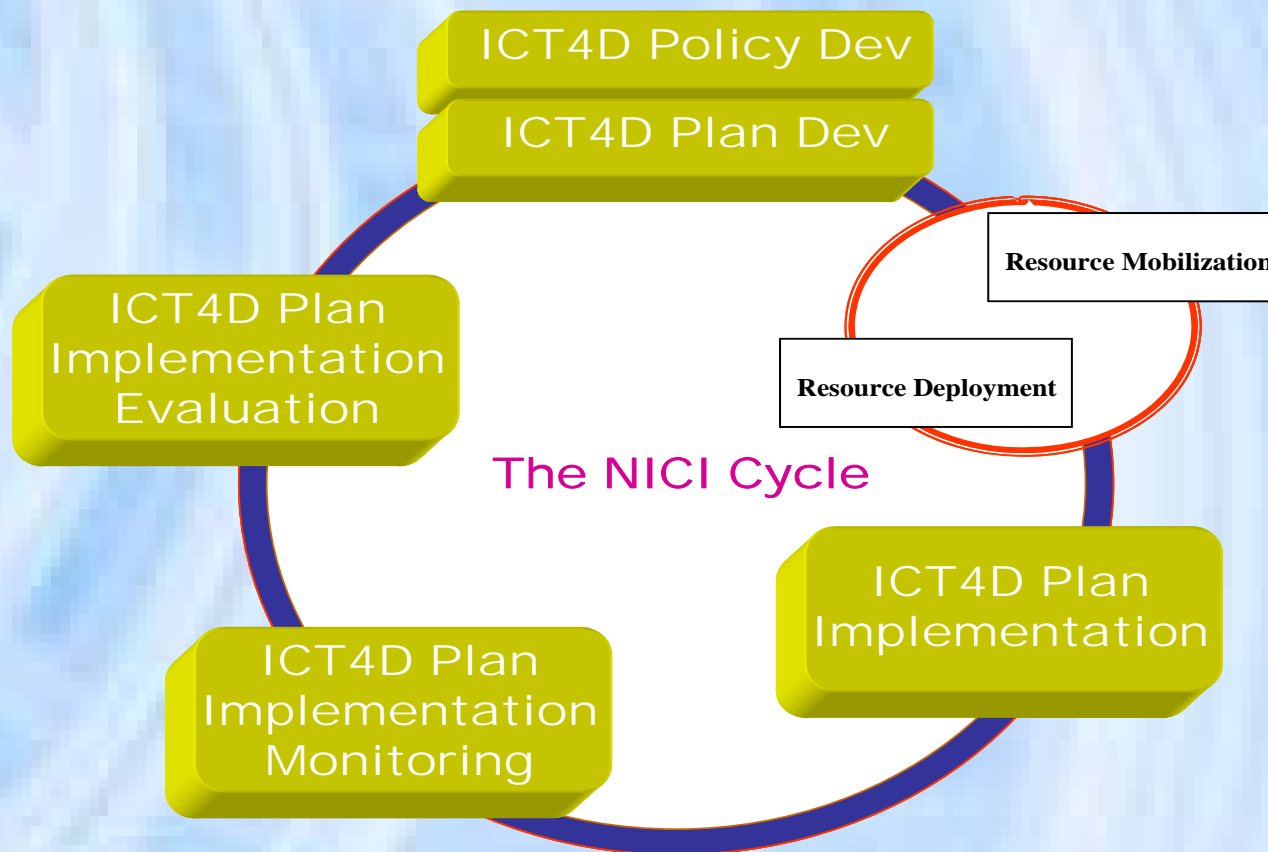
Broad Category of ICT4D Indicators	Purpose and Scope	Area of Focus (What?)	Mechanism/Means (How?)	Periodicity (When?)	Agencies and Entities (Who?)	Types of Indicators ('CUT')
<p>Category 1: IS/ICT4D Status Indicators</p> <p>[Framework A]</p> <p>[CoreReq 1]</p> <p>The ICT4D Process Phase = Framework, Policy, Plan Dev Phases</p>	<p>Measuring the Status of the ICT capacity, usage and development</p>	<p>Relevant ICT4D Pillars focusing on 'Capacity' and 'Usage' Indicators</p>	<p>Baseline Study</p>	<p>Beginning of Each ICT4D Policy/Plan Development (NICI) Cycle</p>	<p>National ICT Dev /Coordination Agencies (NICTD/CA) (e.g. RITA, NITDA, EICTDA)</p> <p>National Statistical Organization (NSO)</p> <p>Others (Research Institutions/Agencies, ICT Observatories ICT Regulatory Agencies (RR) etc)</p>	<p>Capacity Measurement Indicators (Status-Quo)</p> <p>Usage Measurement and Assessment Indicators (Status-Quo/Baseline)</p>
<p>Category 2: IS/IKE Development Monitoring Indicators</p> <p>[Framework B]</p> <p>[CoreReq 2]</p> <p>The ICT4D Process Phase = Plan Implementation</p>	<p>Measuring progress towards the development of the IS/IKE</p>	<p>Key Features and Characteristics of the IS/IKE (see Box 2)</p>	<p>Periodic/Regular Data Collection and Analysis Exercise forming part of National Statistical System</p> <p>Sector-Specific and Special Surveys Carried out at Regular Intervals</p>	<p>Regular as part of National Statistical Data Collection Cycle</p> <p>Periodic/Regular (e.g. bi-annually, annually biennially etc)</p>	<p>National Statistical Organization (NSO)</p> <p>NSO, NICTD/CA, Others</p>	<p>Capacity Measurement and Assessment Indicators (Periodic Monitoring and Assessment)</p> <p>Usage Measurement and Assessment Indicators (Periodic Monitoring and Assessment)</p>
<p>Category 3: Impact Monitoring and Assessment Indicators</p> <p>[Framework C]</p> <p>[CoreReq 3]</p> <p>The ICT4D Process Phase = Plan Implementation</p>	<p>Measuring the Social, Economic and Institutional Impact of the Development of the IS/IKE on Households, Businesses and Govt System</p>	<p>Social, Economic and Institutional Impact focusing on Households, Businesses and Govt Systems and Operations</p>	<p>Annual/Biennial Data Collection and Analysis Exercise/Special Survey</p>	<p>Annually/Biennially within a given NICI Cycle (e.g. For a 4 Year NICI Plan period, can have one at end of each year or once every two years)</p>	<p>National Statistical Organization (NSO)</p> <p>NICTD/CA,</p> <p>Others</p>	<p>Transformation ('Impact') Assessment and Measurement Indicators (Periodic Monitoring and Assessment)</p>

Comments

- In **column 4**, the ‘how’ question is documented . – this relates to the mechanisms or means that could be deployed to facilitate the collection of data on each of the categories of IS/ICT4D indicators.
- In the case of the category 1, ‘capacity’ and ‘usage’ indicators, the Baseline study provides the means for collecting data on these indicators.
- In the case of the category 2 types of indicators for monitoring, assessing and measuring progress towards the development of the IKE, periodic (say annual or biennial) data collection exercise forming part of the national statistical data collection process of the NSOs could be undertaken to collect relevant data on these indicators

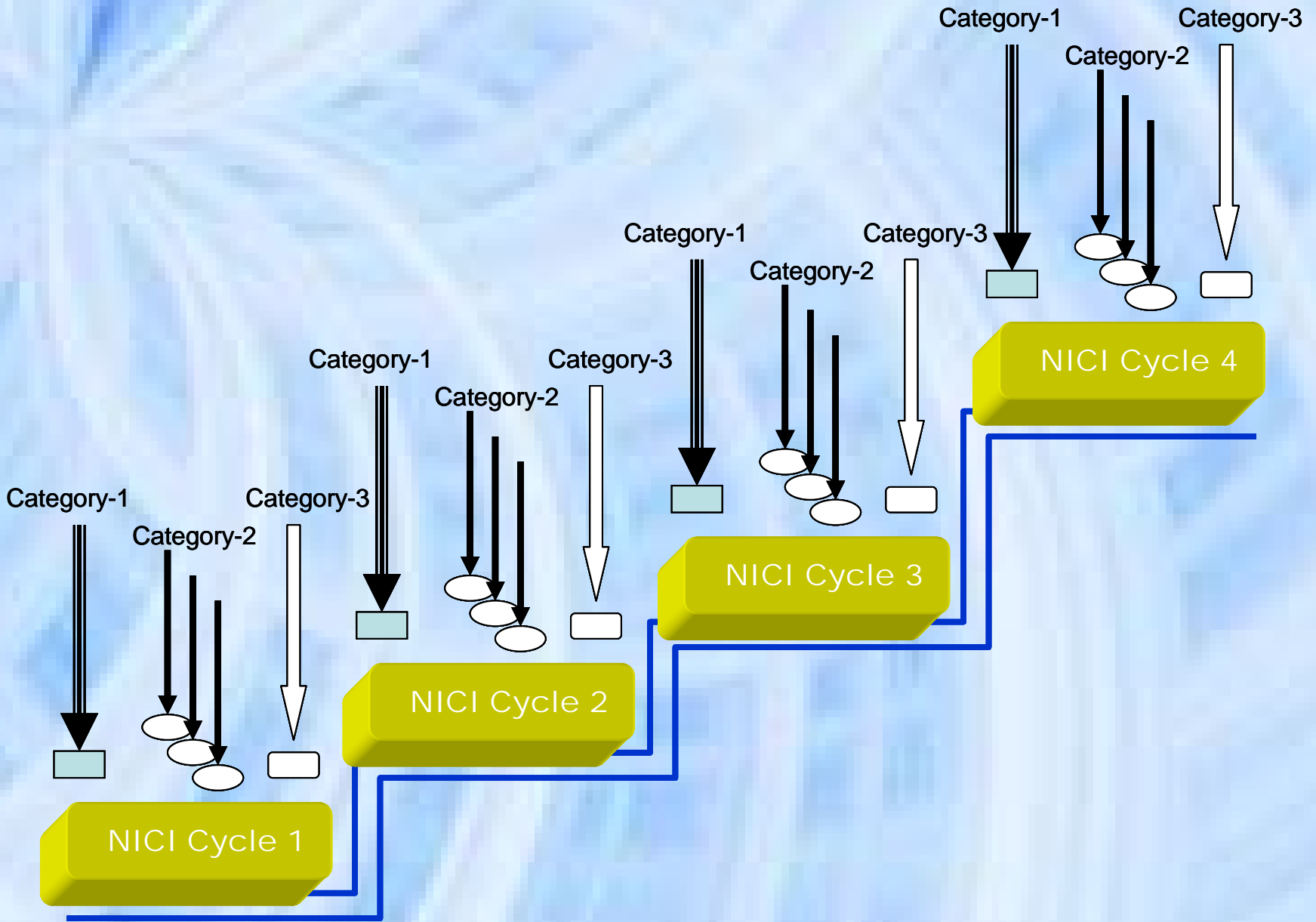
- The NSOs could undertake some sector-specific data collection exercises or special surveys targeted at specific sectors to
 - collect data on relevant category 2 types of indicators to establish progress towards the development of the IKE in a specific sector or broad ICT4D application areas like: e-government, e-commerce, e-education among others.
- These types of surveys could be periodic or carried out at regular intervals.
- Similarly annual/biennial data collection exercises targeted at the category 3 types of indicators could be undertaken by the NSOs to gather information on the impact of the development of the IKE on various economic units and entities.

- In **column 5**, the ‘when’ issue is addressed in terms of the periodicity of the data collection exercise as it relates to each of the categories of IS/ICT4D indicators.
- In the case of the category 1 indicators, Baseline line studies could to be conducted at the beginning of each of the ICT4D policy and plan development cycle (NICI cycle)

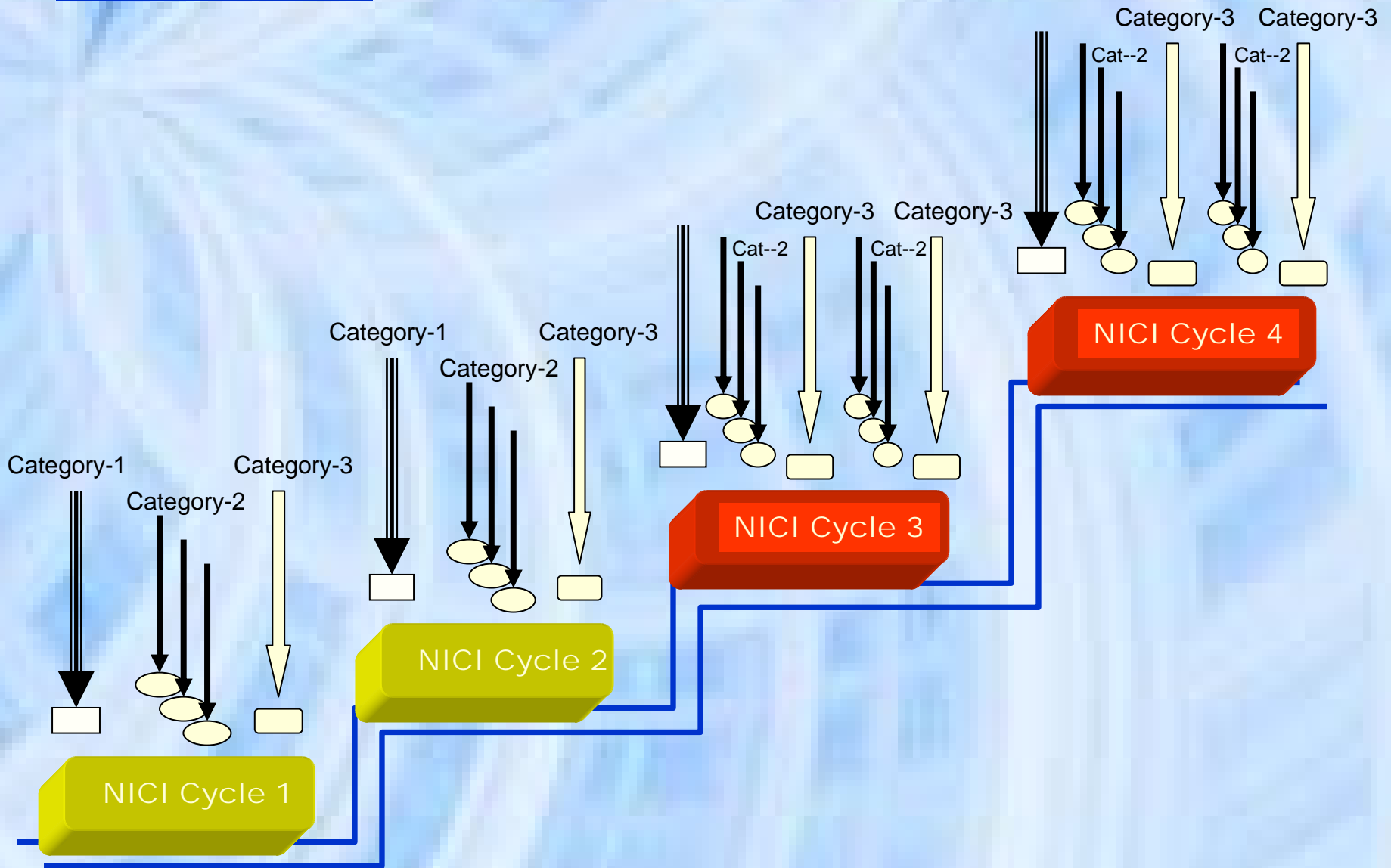


- The anticipation is that, for a given country, the 1st NICI cycle will involve the development of the ICT4D policy and the 1st ICT4D/NICI Plan both supported by a Baseline Study.
- On the assumption that the policy will have a life span of several years (e.g. 15-20 years) with provisions for revisions as need be,
 - subsequent NICI cycles within the life-span of the policy will only involve the development, implementation, monitoring and the evaluation of subsequent plans; with the development of each supported by a Baseline Study
- The data collection exercise in relation to the category 2 types of indicators could be carried out at regular/periodic intervals within each of the NICI cycles during the Plan implementation monitoring phase.
- For example, for a 4-year NICI Plan the NSO could undertake regular (say annual) data collection exercise (during the implementation of the plan) as part of its regular national statistical data collection cycle.

- Special targeted surveys could also be conducted to monitor the implementation of the plan to establish whether targets set are being achieved or progress is being made to achieve them using specific types of category 2 indicators.
- In relation to the category 3 types of indicators one set of data collection exercise could be conducted getting the end or at end of the time-frame of the plan or the NICI cycle to evaluate the implementation of the Plan in terms of its impact on economic units.
- On the whole, while one set of data gathering exercise could be undertaken at the beginning and the end of the NICI cycle for the category 1 and the category 3 types of indicators respectively,
 - a number of specific data collection exercises is envisaged during the implementation of the Plan in relation to the category 2 types of IS/ICT4D indicators.



Alternatively



- **Column 6** address the ‘who’ question as it relates to the candidate data collection entities or agencies.
- The Baseline Studies as it relates to the category 1 types of indicators can for example be carried out jointly by
 - a number of agencies including the NSO, the National IT/ICT Development Agency (e.g. RITA (Rwanda), NITDA (Nigeria), EICTDA (Ethiopia) etc),
 - and others like Research Institutions/Agencies, ICT Observatories ICT Regulatory Agencies (RR) etc.
- Candidate institutions for the category 2 and the category 3 types of indicators include the NSOs, the National IT/ICT Development Agencies among others.

**THANKS FOR YOUR
ATTENTION**

.... AND PATIENCE