APPENDICES

STRATEGIC PATHWAY 8: CAPACITY AND EDUCATION

APPENDIX 8.1:   An Example of a Knowledge-Skills-Resource Matrix for an Organization

✓ = Capacity Achieved/ ✗ = Capacity Development Required

Knowledge/Skills	Resources	Subject Matter Experts	Leadership Transformation	Government ITC Capacity	Research and Business Development	Integrated Planning Capability	Citizen Awareness
General	Computer Internet Access Policies, norms, guidelines	✓	✓	✓	✓	✓	✓
IT Skills	Computer (High-end) Internet Access Policies, norms, guidelines	✓			✓	✓	
Project Management	Computer Internet Access Policies, norms, guidelines	✓	✓		✓	✓	
Leadership	Computer Internet Access Policies, norms, guidelines	✓		✓	✓	✓	
Geospatial Data collection, management	Computer (High-end) Internet Access Meta data editor Image processing Software Policies, norms, guidelines	✓					
Geospatial Analyst	Computer (High-end) Internet Access GIS Software, Image analysis Software	✓		✓	✓	✓	

Knowledge/Skills	Resources	Subject Matter Experts	Leadership Transformation	Government ITC Capacity	Research and Business Development	Integrated Planning Capability	Citizen Awareness
	Policies, norms, guidelines						
Programming	Computer (High-end) Internet Access GIS Software Policies, norms, guidelines	✓		✓	✓		
Cartography	GIS Software Publishing Software Policies, norms, guidelines	✓				✓	
Database Management	Computer, Internet Access Various database systems Policies, norms, guidelines	✓		✓	✓	✓	
Communication	Computer, Internet Access Policies, norms, guidelines	✓	✓	✓	✓	✓	✓

APPENDIX 8.2: An Example of a Knowledge-Skills-Resource Matrix for a Team

✓ = Capacity Achieved/ ✖ = Capacity Development Required

Knowledge/Skills	Resources	PERSON 1 Team Leader	PERSONS 2-6 Subject Matter Experts	PERSON 7-8 ITC Expert	PERSON 9-12 Research and Development Expert	PERSON 13-14 GIS Analyst	PERSON 15 Support Staff
Geospatial Information							
General GIS Concepts	Computer Internet Access	✓	✓	✓	✓	✓	✓
Geospatial Data Entry, Conversion and Maintenance	Computer (High-end) Internet Access GIS Software		✓		✓	✓	
Cartography and Graphic Design	Computer (High-end) Internet Access GIS Software Publishing Software		✓		✓	✓	
Metadata creation and editing	Computer Internet Access Metadata editor		✓	✓	✓	✓	
Image Interpretation	Computer (High-end) Internet Access Image analysis Software		✓				
GIS Analysis	Computer (High-end) Internet Access GIS Software		✓	✓	✓	✓	
GIS Workflows	Computer (High-end)	✓	✓	✓	✓	✓	

Knowledge/Skills	Resources	PERSON 1 Team Leader	PERSONS 2-6 Subject Matter Experts	PERSON 7-8 ITC Expert	PERSON 9-12 Research and Development Expert	PERSON 13-14 GIS Analyst	PERSON 15 Support Staff
	Internet Access GIS Software						
3D Modelling	Computer (High-end) Internet Access GIS Software		✓		✓	✓	
4D Modelling	Computer (High-end) Internet Access GIS Software		✓		✓	✓	
Basic understanding of programming			✓	✓	✓	✓	
Structured Query Language (SQL) knowledge	Computer Internet Access SQL Programming Software		✓	✓	✓	✓	
Object Oriented programming	Computer Internet Access O-O Programming Software			✓	✓		
Basic GIS architecture (desktop and web)	Computer Internet Access GIS Software		✓	✓	✓	✓	
Web Services knowledge and experience	Computer Internet Access		✓	✓	✓	✓	
Database Skills	Computer Internet Access		✓	✓	✓	✓	

Knowledge/Skills	Resources	PERSON 1 Team Leader	PERSONS 2-6 Subject Matter Experts	PERSON 7-8 ITC Expert	PERSON 9-12 Research and Development Expert	PERSON 13-14 GIS Analyst	PERSON 15 Support Staff
Proficiency in Mobile Apps	Mobile Smart Phone	✓	✓	✓	✓	✓	✓
Project Management Sills							
Project Management and Design	Computer Internet Access	✓		✓	✓		
Ability to translate user needs to solutions	Computer Internet Access	✓	✓	✓	✓	✓	
Skills transferrable to multiple domains	Computer Internet Access	✓	✓	✓	✓	✓	
Communication Skills	Computer Internet Access	✓	✓	✓	✓	✓	✓
Monitoring and Evaluation	Computer Internet Access	✓		✓	✓	✓	
Problem Solving Skills	Computer Internet Access	✓	✓	✓	✓	✓	✓

APPENDIX 8.3:   An Example of a Capacity Scanning Matrix

Adapted from European Commission Tools and Methods Series, Reference Document Number 6, Toolkit for Capacity Development (2010) available at https://ec.europa.eu/europeaid/sites/devco/files/guidelines-toolkit-capacity-development-2010_en.pdf

Capacity area/factors	Present level of capacity (1 = low, 5 = high)	Key strengths to build on	Key weaknesses to address or, if beyond influence, to appreciate	Notes
CONTEXT OR OPERATING ENVIRONMENT • Effectiveness and adequacy of legal/regulatory/broader policy framework • Oversight and supervision, pressure for accountability • Pressure for performance from citizens/customers/ political leaders/competitors • Effectiveness of formal and informal networks and connections • Overall public sector incentives, reforms • Other				
CLARITY OF RESULTS, MANDATE, AND PURPOSE • Quality, quantity and relevance of products/ services • Achievement of past targets • Contribution to desired outcomes and impact • Other				

Capacity area/factors	Present level of capacity (1 = low, 5 = high)	Key strengths to build on	Key weaknesses to address or, if beyond influence, to appreciate	Notes
ADEQUACY OF RESOURCES • Match between objectives, mandate and resources • Predictability of resource envelope • Match between funds for salaries, operational costs and investments • Ability to recruit staff with adequate skills/ experience • Other				
ORGANISATION, MANAGEMENT AND INFRASTRUCTURE • Clarity of, and compliance with strategies • Structures ensuring balance between specialization and coordination • Systems and processes adequately ensuring efficiency • Communication and information sharing flowing in and between units • Other				
TECHNICAL SKILLS • Explicit knowledge and methodologies (which for individuals can be considered as competent)				

Capacity area/factors	Present level of capacity (1 = low, 5 = high)	Key strengths to build on	Key weaknesses to address or, if beyond influence, to appreciate	Notes
• Organizational capacity to function: appropriate structures; systems and procedures for management, planning, finance, human resources, monitoring and evaluation, and project cycle management; the ability to mobilize resources • Laws, policies, systems and strategies (enabling conditions) • Other				
ORGANISATIONAL CULTURE AND VALUES • Correspondence between formal values and actual behavior • Culture promoting efficiency and problem solving • Positive atmosphere in daily relations • Team-spirit and identification with the vision/ mission • Other				
VISION AND LEADERSHIP • Clarity of directions and guidance from leaders • Adequate involvement and consultation of staff • Encouraging innovation				

Capacity area/factors	Present level of capacity (1 = low, 5 = high)	Key strengths to build on	Key weaknesses to address or, if beyond influence, to appreciate	Notes
• Role of self-review and critical reflection • Other				
ATTITUDE TO CHANGE • Priority of change and resources for it • Previous experiences of change • Capacity to manage change • Other				
MONITORING MECHANISMS • Availability of data on performance (outputs, client satisfaction, staff satisfaction) • Monitoring data informing strategic and operational decisions • Monitoring data available to staff and key stakeholders • Other				

APPENDIX 8.4: An Example of an Incremental Approach to Needs Assessment and Analysis

Target Group	Current Situation	Capacity Development Goal	Capacity Required	Possible Strategies
Subject Matter Experts	E.g. Where we are now: Our existing capacities and the relevant factors that enable us to contribute towards achieving our mandate in respect to geospatial information management	The outcome we are trying to achieve with improved capacity development	What capacity would enable us to move forward and increase the level/quality of our outputs in the direction of our development goals?	E.g. The activities that need to be performed to address the gap in capability
Leadership Transformation				
Government ICT Capacity				
Research and Business Development				
Integrated Planning Capability				
Citizen Awareness				

APPENDIX 8.5: An Example of a Gap Analysis Approach to Needs Assessment and Analysis

Target Group	Current Capacities	Capacity Development Goal	Gap in Capability	Possible Strategies
Subject Matter Experts	E.g. Where we are now: What Can't be done? What is missing in terms of the ideal situation	E.g. Ideal situation: the system (individual, organizational and institutional functioning at full capacity	E.g. The gap to be filled between the ideal situation and where we are now.	E.g. The activities that need to be performed to address the gap in capability
Leadership Transformation				
Government ITC Capacity				
Research and Business Development				
Integrated Planning Capability				
Citizen Awareness				

APPENDIX 8.6:   An Example of PEST and SWOT Analyses for Capacity and Education

A. PEST Analysis

The PEST Analysis considers the external environment and focusses on the **P**olitical, **E**conomic, **S**ocial and **T**echnology issues that may have a positive or negative impact on capacity initiatives, and education and training programs

An example of topics that may be raised during a PEST Analysis are presented below.

POLITICAL	ECONOMIC	SOCIAL	TECHNOLOGICAL
• Lack of geospatial awareness at Political level • Limited Education funding programs • Bureaucracy Issues (Re Tape) • Potential for International Cooperation	• Staff Retention • Salaries • Modernization and maintenance • Plant, equipment and personnel availability • Public-Private Partnerships	• Institutional Culture • Community needs • Intergenerational issues • Computer literacy • Crowdsourcing	• Data quality • Technology level • Power (utilities) availability • Limited Broadband capacity • Standards, Metadata etc.

B. SWOT Analysis

The SWOT Analysis considers internal factors; namely the characteristics of government that are an advantage or disadvantage to capacity building and education systems, those aspects that can be exploited to advantage and those realities that are a threat to implementation. While threats are often considered to be out of people's control, they may still have an influence on outcomes and be able to make a valuable contribution. For example, while legislators are responsible for drafting Open Data Policy, capacity building in geospatial information management will shape the policy to bring out opportunities.

- **S**trengths: characteristics of government that are an advantage to the IGIF Project.

- **W**eaknesses: characteristics that place the IGIF project at a disadvantage

- **O**pportunities: elements that the IGIF could exploit to its advantage

- **T**hreats: elements in the environment that could cause trouble for the IGIF during and after implementation.

An example of issues that may be raised during a SWOT Analysis are presented below.

WEAKNESSES	OPPORTUNITIES	THREATS
- Obsolete Technology - Not enough geospatial analysts - Limited Cross agency collaboration - Limited broadband capacity	- Expansion of data use - New applications - Community crowdsourcing - Increase community trust - Partnerships	- Change in policy - Consumer behavior - Unemployment trends - Aging Workforce

APPENDIX 8.7: An Example of the Typical Components of a Capacity Development and Education Strategy

The Capacity Building and Education Strategy typically includes the following components (figure below):

- Purpose of the Capacity Needs Assessment – this will highlight the case for change.

- Identification of relevant national priorities, strategies, laws and policies – this helps to align capacity development and education and training programmes with the broader enabling environment.

- Identification of target groups for capacity development and engagement programmes, including the recognition of any gender or other cross-cutting issues. These are typically identified through stakeholder engagement strategy or workshops (See SP9: Act. 9.6.3).

- Vision, mission and goal statements for capacity development and education programmes – these statements will build common aspirations among stakeholders and provide for leadership and coordination.

- Activities (sometimes referred to as interventions) that will address gaps in capability and overcome barriers to change. Activities are usually associated with the objectives for each goal.

- The broad approach to capacity development and education programmes – provides context for the activities identified and the resources required to deliver on the goals.

- Outcomes and impact of capacity development, and education programmes. This information is used to build in-kind and financial support for initiatives.

- A road map – highlighting short, medium- and long-term horizons

- The approach to monitoring and evaluating the capacity development and education programmes as-a-whole.
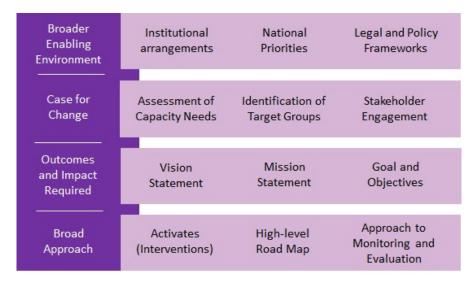

Figure - Components of the Capacity Building and Education Strategy

APPENDIX 8.8: Examples of Types of Capacity Development Approaches

The following capacity development approaches are grouped according to the Strategic Pathway elements – Awareness, Education. Professional Training, and Entrepreneurship. It should be noted that some of the techniques are suited to more than one element.

Element	Capacity Development Approach	Description
Awareness	Advocacy	lobbying, media campaigns, public events, etc. to influence both public opinion on the demand side and the highest-level decision-makers
	Information and resources	
	Opening doors and facilitating access	
Education	Intensive Training Courses	Courses for which the content and curriculum are predefined by the provider, who may be a private company, a training institute, or not-for-profit organization
	Modular Training Courses	
	Facilitated workshop or exercise	
	Scholarships	Academic study programmes offered by overseas universities for participants to follow from home.
	E-Learning	Technology-supported or web-based learning systems. E-learning can happen across distances and borders or within one organization
Professional Training	Technical Expertise/Advice	
	Coaching and Mentoring Programs	Mentoring is generally a long-term process of supporting an individual's career and personal development.
	Leadership development	Processes designed to enhance the leadership skills of existing and potential leaders within systems. Most effective when training modules are combined with activities such as exposure visits, and coaching or mentoring (LenCD, 2011).
	Internship	
	Shadowing or Observing	

Element	Capacity Development Approach	Description
	Apprenticeship	
	Exposure or exchange visit	Exposure visits take people to see what others are doing in work situations similar to their own. Attending conferences and other events provide exposure to new knowledge, ideas and influences within sectors
	Peer Support groups and Peer Assists	
	Peer Review	
	Accompaniment	
Entrepreneurship	Harvesting experiences	
	Partnerships and Networking	This can include twinning organizations, universities and institutions with similar mandates, and the same or different levels of capacity.
	Joint Monitoring and Evaluation	

APPENDIX 8.9:   Template for Recording Success Indicators for Capacity Development

Goal	Objective	Outcomes	Success Indicators	Means of Verification
Establish enduring capacity building programs and education systems so that geospatial information management and entrepreneurship can be sustained in the longer term.	The objective is to raise awareness and develop and strengthen the skills, instincts, abilities, processes and resources that organizations and communities require to utilize geospatial information for decision-making.	A heightened awareness and adoption of geospatial technologies by organizations and the community	Geospatial information is regularly used by organizations and the community	The number of end user data views (website hits) recorded
	The objective is to increase the number of people that have fundamental knowledge of geospatial information management capabilities.	A highly skilled geospatial information workforce	Organizations have access to an increased number of highly qualified geospatial professionals	Number of graduating Professionals year in year out.