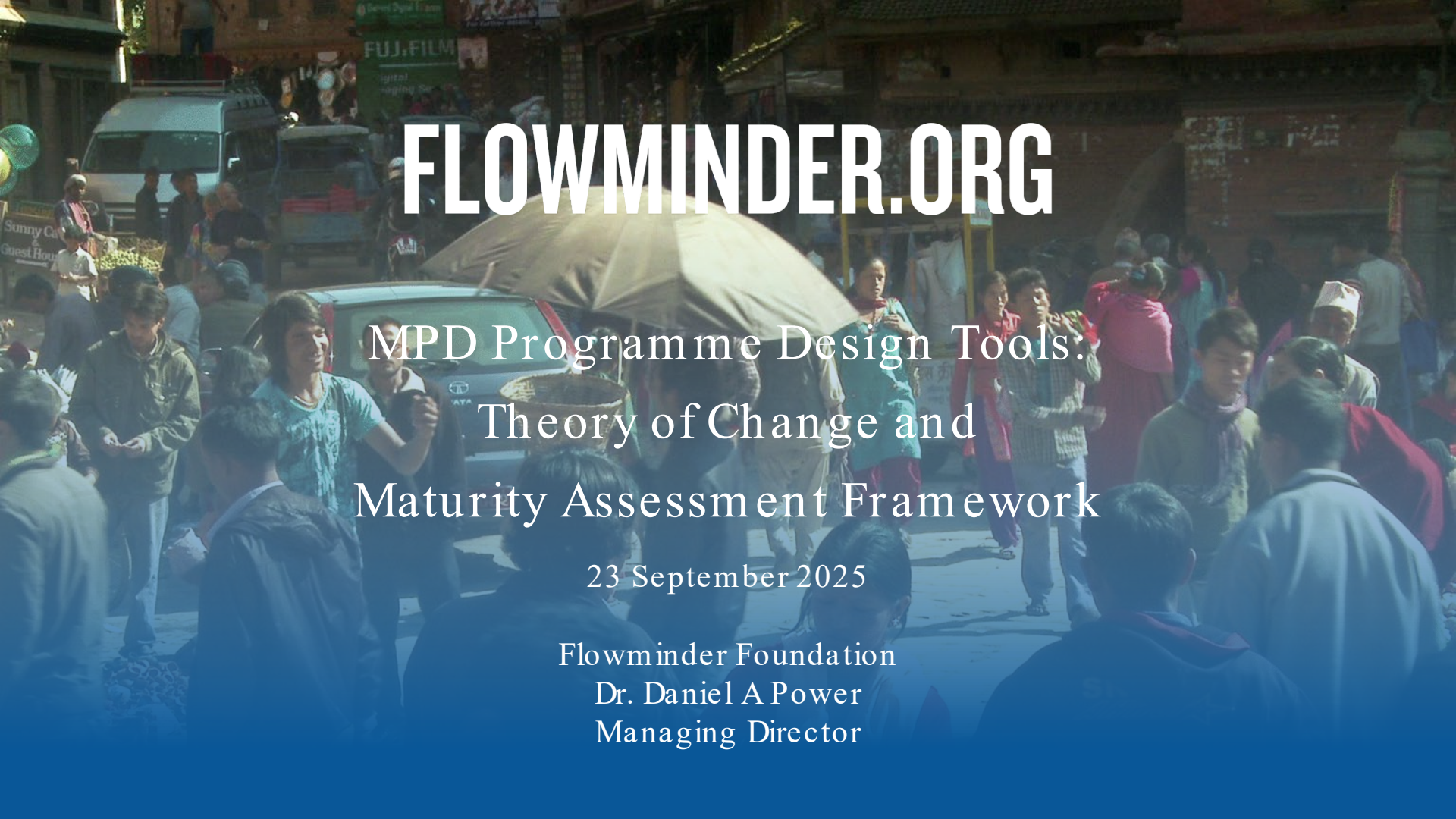

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MPD Programme Design Tools: Theory of Change and Maturity Assessment Framework

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Flowminder Foundation
Dr. Daniel A Power
Managing Director

Transforming mobile phone data (MPD) into actionable insights for policy and operational decision-making

Challenge

In data-scarce settings, policy makers are flying blind, guessing when they should be knowing.

Limitations

On their own, current data collection, like census or surveys either take too long, lack representativity, or are too costly.

Opportunity

However, mobile operator data, which are passively and routinely generated, are available in all countries in a standard format at all mobile network operators.

Solution

MPD programmes can provide timely, representative and cost-effective data and insights for many applications.

Role of telecommunications regulatory authorities

- Provides **regulatory oversight** to MPD programmes
- Already has **regular contact** with MNOs
- Often has a **development agenda**
- May already have mandate to collect records, so some regulators can be a **data processor** as well as playing a regulatory role

Theory of Change for Mobile Phone Data Initiatives

Putting Mobile Phone Data to work for Policy

What does success look like for this goal?

1. MPD **used systematically** to **enhance the evidence base** for policy and decision making
2. MPD is **integrated** into the **national data system** on a sustainable basis
3. MPD is **used responsibly for policy and statistics** within a national institutional environment that has both **enablers and safeguards**
4. MPD is **enabling assessment and prediction** of policy challenges
5. MPD is **helping users** to **monitor real -time progress** on SDGs

Why develop a Theory of Change?

Making a **Theory of Change** allows you to build a **comprehensive analysis** of **how** and **why** the change you want to see is likely (or not) to be achieved.

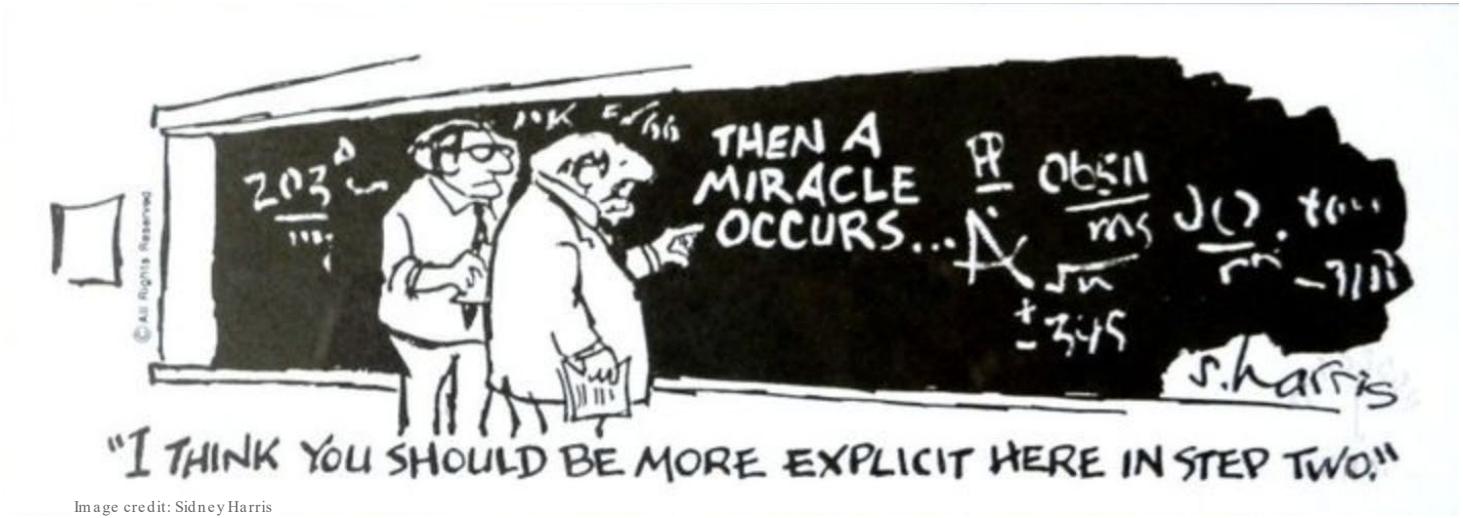


Image credit: Sidney Harris

Structure of the MPD4P Theory of Change

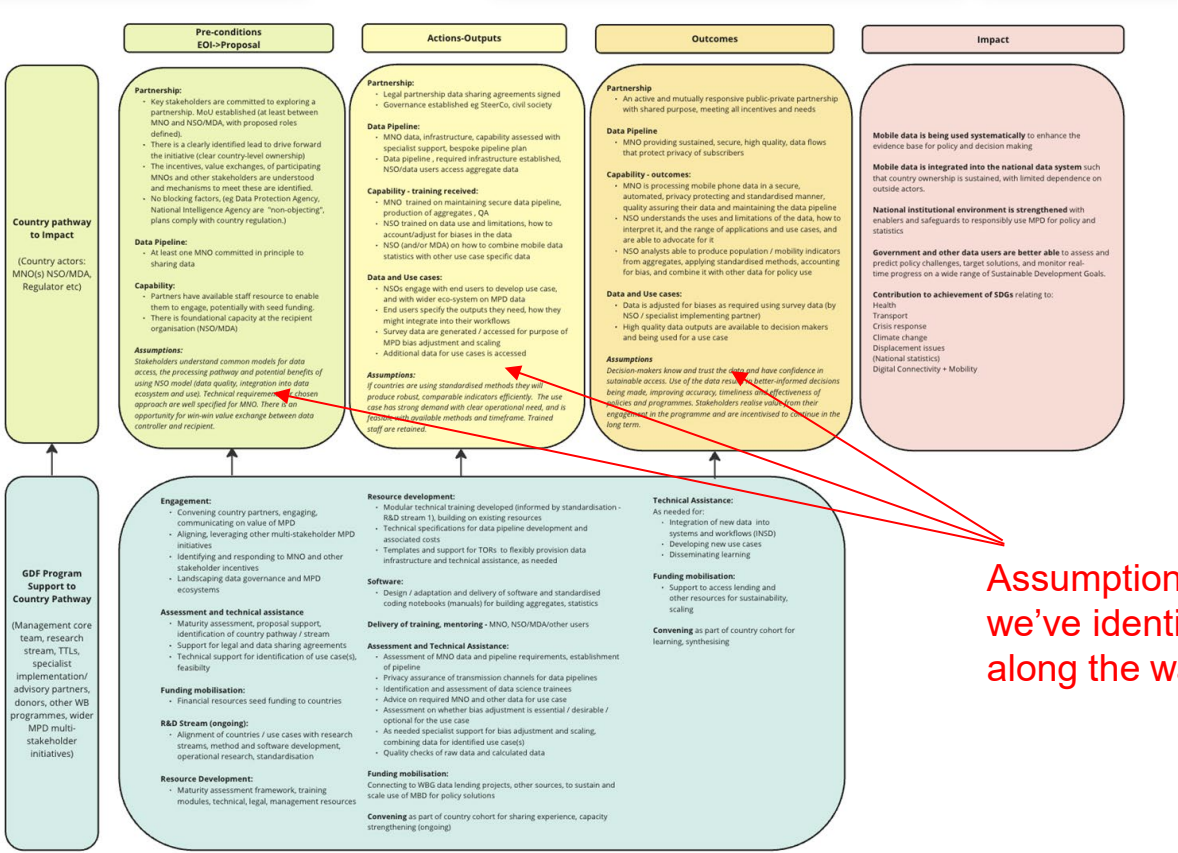
Two rows:

1. The country-level "pathway to impact"

This represents a 'generic' Theory of Change at country-level

2. The MPD4P program-level inputs

This captures all the kinds of support that a country might need from the programme at different stages along it's 'pathway to impact'



Assumptions we've identified along the way

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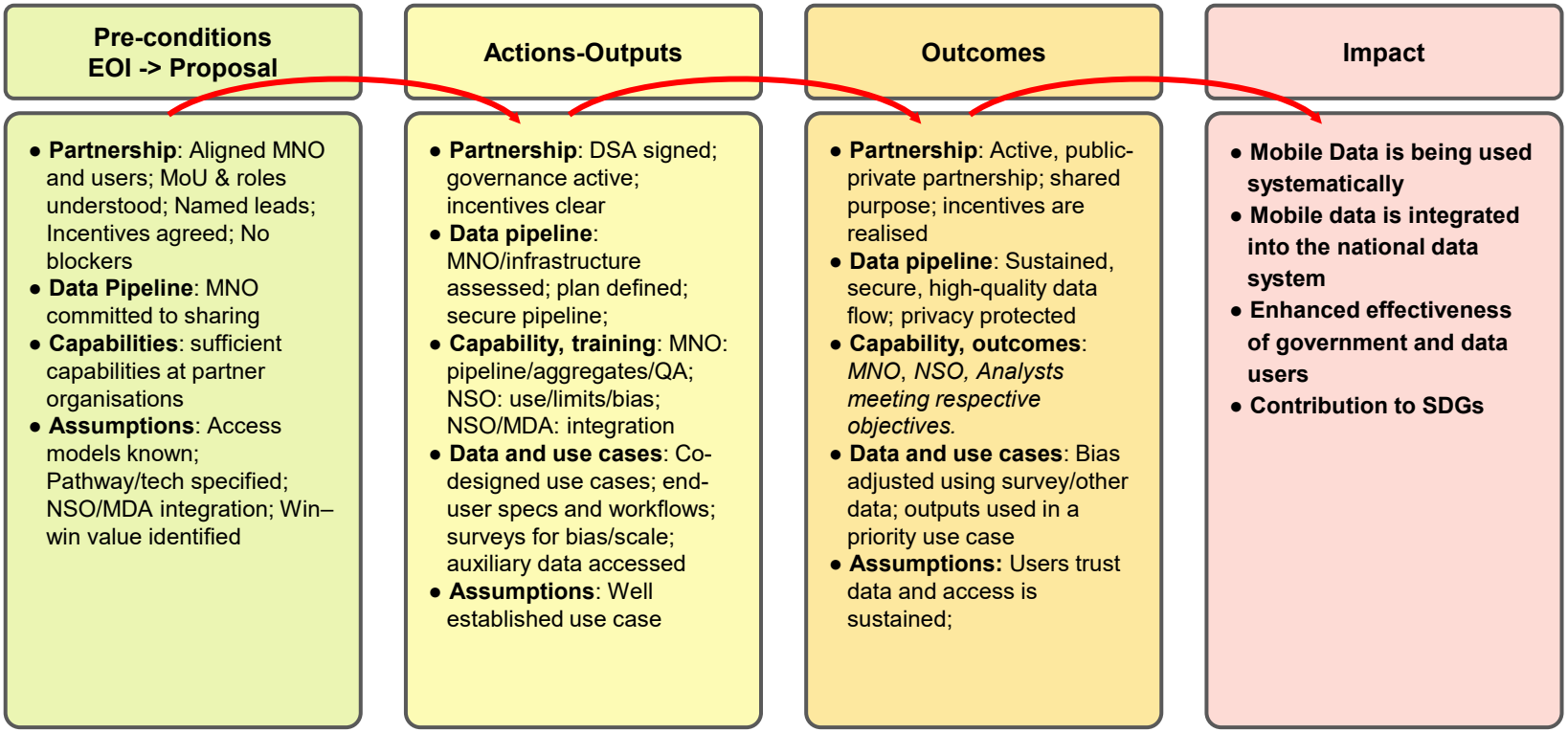
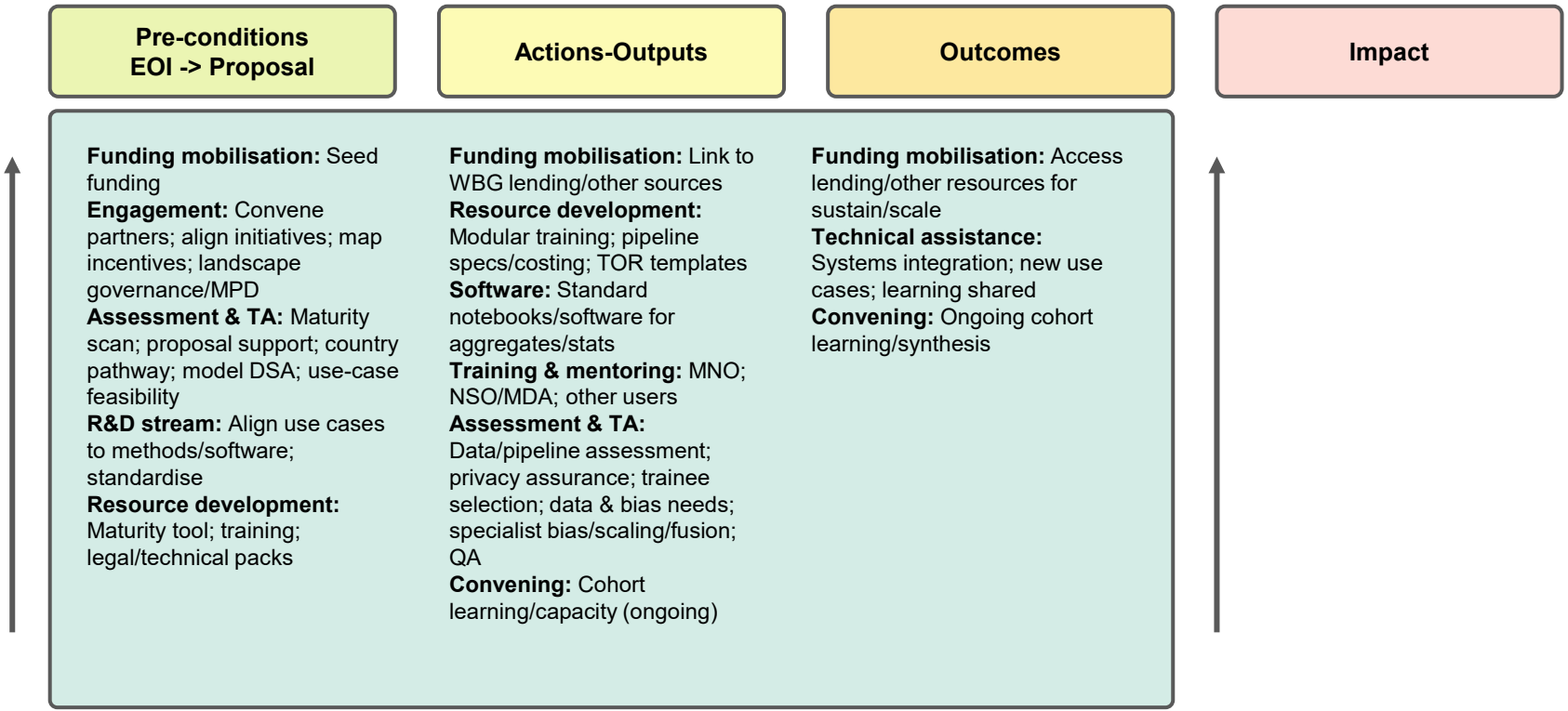
Country Pathway to Impact: ToC Summary



Country Pathway to Impact: Summary of GDF support



Narrative description of the MPD4P Theory of Change

Online resources

Putting Mobile Phone Data to work for Policy: Theory of Change Narrative

A summary narrative document to support readers of the Theory of Change for the *Putting Mobile Phone Data to work for Policy* programme hosted by the World Bank

Introduction

This document sets out in more detail the Theory of Change described here for the World Bank's programme 'Putting Mobile Phone Data (MPD) window. This Theory of Change is a work in progress and currently being consulted on (June 2024).

Background to the programme

Launched in 2023, the programme aims to 'mobilise investments to accelerate local capacity to integrate the responsible use of anonymized, aggregated MPD into National Data systems for real-time statistics and responsive policy solutions'. To read an explanatory powerpoint presentation about the programme, please see here.

Why mobile phone data?

In LMICs with constraints to generating reliable data through traditional methods, and scarcity of data sources, non-traditional data and Big Data such as mobile phone metadata, can be applied and combined with other data, using new methods, to rapidly generate current information. Its strengths include that it has large geographic scale and penetration and high granularity, and that it is automatically generated in near-real time.

What are the barriers to use of mobile phone data?

The programme is being designed, in part, to tackle some of the barriers to adoption of mobile phone data being used as one of the tools that can inform data-driven decision making.

Some of these barriers to use include:

- low awareness and understanding of the potential, and limitations, of the data
- concerns about data protection for privately-held data
- limited experience of establishing public-private data partnerships for accessing privately-held data, and legal and data protection agreements
- cost of establishing data pipelines
- need for engineering expertise to establish reliable privacy protecting data pipelines and software
- scarcity of analytical skills to develop robust methods for different applications
- capacity gaps in LMICs, from technical capabilities to available human resources
- few fully realised and evidenced, replicable data use cases, and limited range of applications to date
- limited experience of integrating non-traditional data products into national data ecosystems to facilitate use and sustainability

The Theory of Change

Background

Purpose

The purpose of the Theory of Change is to:

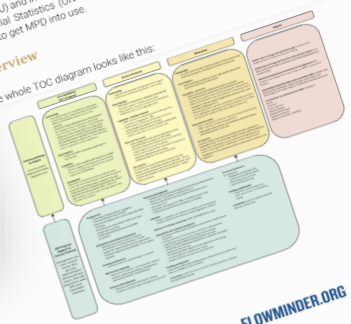
- Describe the shared vision of the programme
- Identify what needs to happen at country level, identifying key assumptions, and what the GDF-MPD programme needs to do, to support countries
- Provide a communication tool for sharing these ideas with relevant stakeholders for refinement and validation
- To guide monitoring and evaluation (the Theory of Change will be updated ad hoc, based on ongoing learning)

Development process

This Theory of Change was developed with the World Bank project team working on the Global Data Facility Mobile Phone Data window, together with staff from the International Telecommunications Union (ITU) and in consultation with members of the UN Committee of Experts on Big Data and Data for Official Statistics (UN-CEBD), drawing on collective experience in the sector regarding 'what works' to get MPD into use.

Overview

The whole TOC diagram looks like this:

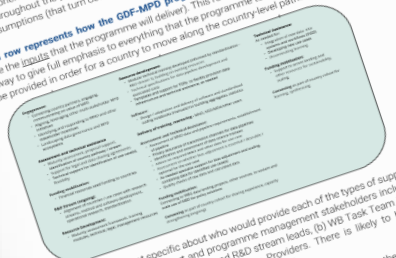


The **top row** of this diagram represents **a country-level pathway to a set of desired outcomes** including:

- A public-private **partnership** between country stakeholders
- Sustained, privacy protecting **provision of mobile phone data (MPD)**
- Stakeholder **capability to process and analyse** the data
- The **data being applied** to a national policy/programme related use case

This is intended to be a generic pathway that would be relevant to any country included in a WB-GDF programme cohort, and it does not presuppose a particular use case. Countries may be starting from different points in the pathway (maturity); stakeholders will vary; the partnership arrangements are likely to be different; and aspects such as how data is accessed, what types of data, who analyses and who uses it will vary across countries. But there are general similarities and some standard components that are required. Part of the purpose of developing and using the ToC as a learning tool throughout the programme is to identify the range of variation and any unanticipated actions, or assumptions (that turn out to be necessary conditions) for outcomes to be achieved.

The bottom row represents how the GDF-MPD program would support the country along the pathway (i.e the inputs that the programme will deliver). This row is separated out from the country-level pathway to give full emphasis to everything that the programme team understands must be in place or be provided in order for a country to move along the country-level pathway



This 'support pathway' is not specific about who would provide each of the types of support needed. For this programme, the key support and programme management stakeholders include: (a) GDF-MPD programme management core team and R&D stream leads; (b) WB Task Team Leads (TTLs), and (c) other suppliers, such as Technical Service Providers. There is likely to be variation in particular in how the specialist technical support is provided.

The support needs will probably also vary by country according to, for example, the stage of maturity (where they are starting from with partnerships and capabilities), and what kind and complexity of data analysis and use they want to deliver.

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Maturity Assessment for Mobile Phone Data Initiatives

Maturity Framework as a planning tool

Granular descriptions of the different dimensions that constitute an MPD initiative and what different levels of maturity might look like for each dimension.

Purpose:

- Identify the types of support that an initiative needs to develop
- Assess how an initiative has progressed within the programme

Online resources

Structure | Maturity Stages

Pre-foundation	Foundation	Practitioner	Expert
No MPD being shared or analysed (except internal business intelligence by MNO). Data controller(s) and data user(s) are in negotiation but **no agreement has been signed**, no regulatory has been sought or approved and/or no legal basis has been established. Some potential applications have been identified in broad terms, but there are **no plans for implementation**	There is some initial building of **capacity and technical infrastructure** for the (small-scaled) storage and processing of MPD but no export or analysis of MPD (except internal business intelligence). **MPD only available for a short period** of time (e.g. most recent 6 months) **Data controllers(s) and user(s) are in alignment** and seeking engagement with regulators and other stakeholders. **Some applications identified** in some detail, with plans for pilots/proofs of concept.	There is **suitable technical capacity and infrastructure** for the regular export of MPD-derived anonymised aggregates and indicators to data user(s). **MPD is available** for an extended period of time (e.g one or more years) The data controller(s) and user(s) have **signed agreements and have approval** from regulators. The necessary governance structures are in place to manage and maintain the relationship. Some **pilots/proofs of concept have been delivered** for some applications. There are **plans for scaling** of applications.	There is **strong technical capacity and infrastructure** for the secure, reliable, and speedy processing of MPD and export of anonymised aggregates and indicators to data users. The available **MPD data covers a long period of time** (e.g. 3+ years). A broad range of stakeholders are involved in **governance**. **Applications are being delivered at scale.**

Structure | Areas of Assessment

Assessment Area	Question
Feasibility	*"To what extent do the conditions in a country allow for and facilitate the use of MPD for official statistics?"*
Impactfulness	*"To what extent does the use of MPD for official statistics result in improved decision-making that benefits the people of a country?"*
Sustainability	*"To what extent do current structures and processes enable the long-term use of MPD for official statistics?"*

Assessment Dimensions

Areas of assessment	Dimensions
Feasibility	SUITABILITY OF LEGAL AND GOVERNANCE ENVIRONMENT
	STAKEHOLDER ENGAGEMENT AND ALIGNMENT
	SUITABILITY OF DATA INFRASTRUCTURE
	SUITABILITY OF DATA ENVIRONMENT
	HUMAN RESOURCE CAPACITY AND AVAILABILITY
Impactfulness	IDENTIFICATION AND IMPLEMENTATION OF APPLICATIONS
	POTENTIAL FOR AND PROTECTIONS AGAINST MISUSE
Sustainability	SUSTAINABILITY PROSPECTS

Feasibility

SUITABILITY OF LEGAL AND GOVERNANCE ENVIRONMENT	*Legal & regulatory framework* *Data governance policies of the data controller(s)* *(i.e. Mobile Network Operator(s) (MNOs) or telecommunications regulator)* *Data governance policies of the data end-users* *(e.g. National Statistical Office (NSO), other Ministries, Departments and Agencies (MDAs))* *Public perception*
STAKEHOLDER ENGAGEMENT AND ALIGNMENT	*Disposition of the Data Controller(s)* *(e.g. Mobile Network Operator(s) (MNOs), telecommunications regulator)* *Disposition of the Data User(s)* *(e.g. National Statistical Office (NSO), other Ministries, Departments and Agencies (MDAs))* *Disposition of regulatory bodies*

Feasibility (continued)

SUITABILITY OF DATA INFRASTRUCTURE	*Data Infrastructure of individual Data Controller(s)* *(i.e. Mobile Network Operator(s) (MNOs), telecommunications regulator)* *Data infrastructure of Data Users* *(e.g. National Statistical Office (NSO), other Ministries, Departments and Agencies (MDAs))*
SUITABILITY OF DATA ENVIRONMENT	*Partnership-level data coverage* *Availability and suitability of cell data* *Availability and suitability of census and survey data* *Suitability of complementary data sources from data end-users* *(e.g. National Statistical Office (NSO), other Ministries, Departments and Agencies (MDAs))* *Acceptance and usage of non-traditional data*
HUMAN RESOURCE CAPACITY AND AVAILABILITY	*Human resource capacity and availability at Data Controller(s)* *(e.g. Mobile Network Operator(s) (MNOs), Telecommunications Regulator)* *Human resource capacity and availability at Data Users* *(e.g. National Statistical Office (NSO), other Ministries, Departments and Agencies (MDAs))*

Impactfulness

IDENTIFICATION AND IMPLEMENTATION OF APPLICATIONS	*Identification of applications* *Implementation of applications* *Sharing, publication and use of outputs*
IDENTIFICATION OF AND PROTECTION AGAINST MISUSE	*Awareness of ethical considerations* *Suitability of ethical oversight and governance processes*

Sustainability

SUSTAINABILITY PROSPECTS	*Prospects for ongoing funding of the initiative* *Prospects for ongoing uninterrupted data access* *Capacity of stakeholders to maintain the data pipeline independently*

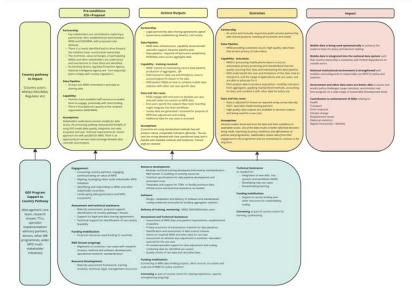
Summary

The ToC and MF support system-level design

Theory of change (ToC): Programme design tool; shows how and why activities lead to impact

Maturity framework: Current-state diagnostic; shows where we are and what is missing

Used together:
Confirm required components;
highlight gaps;
guide design and support



Areas of assessment	Dimensions
Feasibility	
Impactfulness	
Sustainability	

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Daniel A Power PhD
Managing Director, Flowminder Foundation

daniel.power@flowminder.org

www.flowminder.org

info@flowminder.org

@Flowminder