

Strengthening management models for piped water supply services in rural and small town contexts



Decision making resource for selecting and strengthening management models

Introduction

Many governments have set ambitious targets for reaching people with piped water services. Piped water at household level provides one means of achieving safely managed water access in line with SDG 6. Proliferation of piped water must come with stronger endeavours to professionalise service management, ensure adequate levels of external support and ensure services are inclusive. Without attention to management, financing, support, regulation, available water resources and inclusive access there is the risk that piped water services will under perform in low-income areas resulting in poor service levels and lost investment. There are alternatives to piped supply service options and these should be considered where piped supplies are not viable.

This publication

This publication is the second in a series focused on management models for piped water services in rural and small-town settings. It is a decision-making resource designed to help practitioners select or strengthen piped water supply management arrangements in different contexts. The first publication in this series entitled: Management Models for Piped Water Services set out the factors that impact on the sustainability of piped water, presenting a typology consisting of ten different management models. This publication compares the likely viability of these ten management models against the following four variables:

A. Commercial viability and economies of scale

B. Technical complexity, connectedness and local capacity

C. Sector policy, legislation and financing arrangements

D. Regulation and accountability mechanisms, local preferences, and ensuring inclusive services for all



Keys

Variables key

- Commercial viability and economies of scale
- Technical complexity, connectedness and local capacity
- Sector policy, legislation and financing arrangements
- Regulation and accountability mechanisms, local preferences, and ensuring inclusive services for all



WaterAid/Sibtain Haider

Management model key

Basic community management

- CBM1** Community management with minimal or no external support

Community management plus

- CBM2** Community management with external support and some level of professionalised functions
- CBM3** Community management with delegation of some or all functions to private operator through a management contract
- CBM4** Aggregate of community-based management organisations into associations or federations, to support management of rural water supply schemes

Local government

- LG1** Direct management of schemes by local government
- LG2** Local government delegation to community operators through management or lease contracts
- LG3** Local government delegation to private operators or maintenance companies, through management or lease contracts

Public utility

- PB1** Public water utility at town, district, state or national level manages the rural water supply scheme

Private

- PV1** Ministry or asset-holding entity delegates operation and/or maintenance responsibilities to a private company through management or lease contracts
- PV2** Privately owned and operated schemes (invest, build and operate)

Feasibility key

The stronger the colour assigned to a management model the better it is likely to perform in a given context.



This model will most likely be applicable in the given context



This model, while applicable, might face significant challenges in the areas flagged, and will need careful consideration and planning before implementation.



This model will most likely face significant challenges. It is not recommended to adopt it, unless issues can be fully addressed either at operational or sector level. In the far right-hand column some possible actions are given to address the weaknesses or gaps identified.



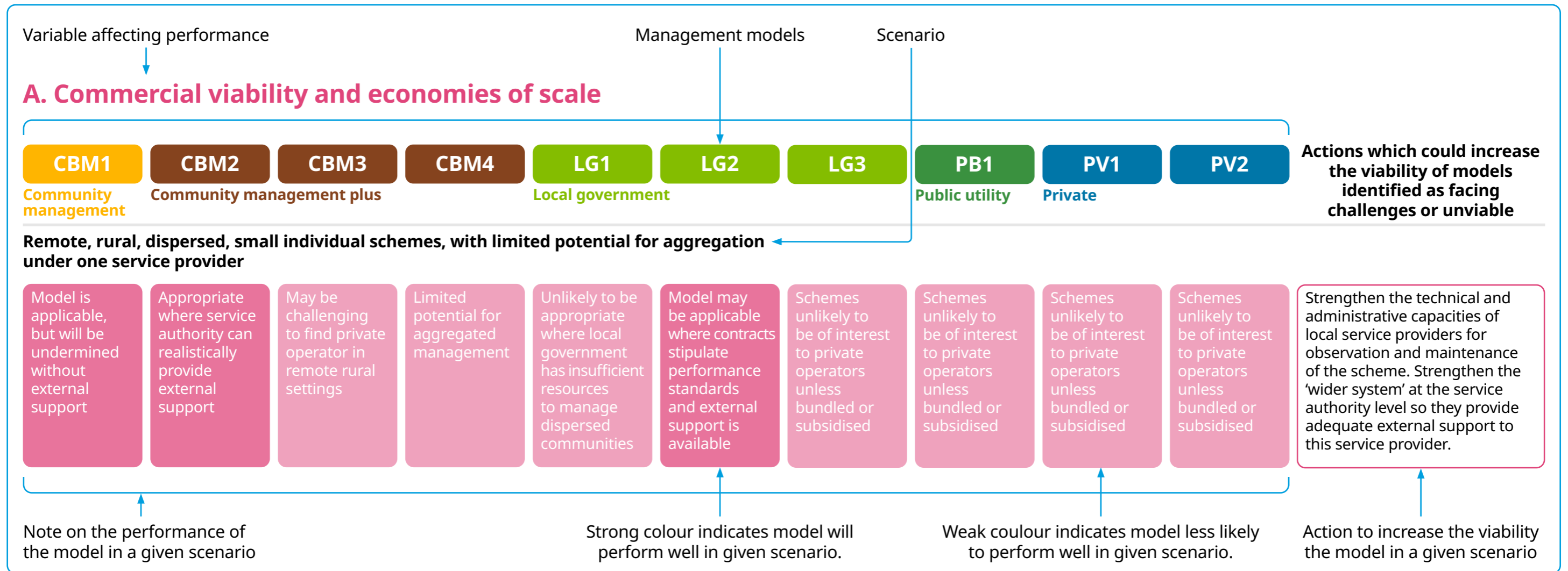
Not relevant to the model



WaterAid/ Ernest Randriarimalala

How to use this guide

Each page in this guide is set out in the format shown in the image below. Please refer to this image to understand how to read the guide.



This guide is divided into four sections each representing a variable that impacts on the performance of different management models:

- A. Commercial viability and economies of scale**
- B. Technical complexity, connectedness and local capacity**
- C. Sector policy, legislation and financing arrangements**
- D. Regulation and accountability mechanisms, local preferences, and ensuring inclusive services for all**

Under each variable are a set of different scenarios that may be at play where piped water supply services are being considered for implementation or where they are operational. You can see which scenarios apply to the context you are working in and see how well any particular management model is likely to perform in that scenario using a colour-based classification system.

The stronger the colour assigned to a management model the better it is likely to perform in a given scenario. The weaker the colour assigned to a management model the less likely it is to perform well in a given scenario. If a scenario is not relevant to a

management model, the model will not be assigned a colour. You can see what actions might be taken to strengthen a model in the right-hand column.

You can use the following four pages to get a high-level overview of how well different models perform in different scenarios. Click on the factor or page number to read more in depth information.

Several scenarios may apply at any one time. It is important to weigh up the pros and cons of each scenario in order to arrive at the most appropriate model.



The applicability of management models for piped water supply services in different scenarios

KEY

Applicable

Applicable but might face significant challenges

Face significant challenges

Not relevant to the model

A. Commercial viability and economies of scale

FACTOR / OPERATING CONTEXT	PAGE	CBM1	CBM2	CBM3	CBM4	LG1	LG2	LG3	PB1	PV1	PV2
Remote, rural, dispersed, small individual schemes, with limited potential for aggregation under one service provider	8	Applicable but might face significant challenges	Applicable but might face significant challenges	Face significant challenges	Face significant challenges	Face significant challenges	Applicable but might face significant challenges	Face significant challenges	Face significant challenges	Face significant challenges	Face significant challenges
Multiple schemes bundled together under one service provider	8	Face significant challenges	Face significant challenges	Applicable but might face significant challenges	Applicable	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable	Applicable	Applicable	Applicable
Low to medium potential to generate sufficient tariff revenue to meet operating costs	8	Applicable but might face significant challenges	Applicable but might face significant challenges	Face significant challenges	Applicable	Applicable but might face significant challenges	Applicable but might face significant challenges	Face significant challenges	Applicable	Applicable	Face significant challenges
Medium to high potential to generate surplus from tariff revenue to meet operating costs and potentially some aspects of capital aintenance	9	Face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable	Applicable
Greater proximity to higher density urban or peri-urban centres, with potential to be networked with urban utilities, either physically or through aggregated or umbrella management arrangements	9	Not relevant to the model	Not relevant to the model	Not relevant to the model	Not relevant to the model	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable	Applicable	Applicable	Applicable
Low interest of utilities or private sector to assume some or all aspects of scheme management	10	Not relevant to the model	Not relevant to the model	Face significant challenges	Not relevant to the model	Not relevant to the model	Not relevant to the model	Face significant challenges	Face significant challenges	Face significant challenges	Face significant challenges
High interest of utilities or private sector to assume some or all aspects of scheme management	10	Not relevant to the model	Not relevant to the model	Applicable but might face significant challenges	Not relevant to the model	Not relevant to the model	Not relevant to the model	Applicable	Applicable	Applicable	Applicable
Low standardisation of technologies in an area	11	Face significant challenges	Face significant challenges	Face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable	Applicable	Applicable	Applicable but might face significant challenges
Scheme integrated with alternative, economic uses of water	11	Applicable	Applicable	Applicable	Applicable	Applicable	Applicable	Face significant challenges	Face significant challenges	Face significant challenges	Face significant challenges

The applicability of management models for piped water supply services in different scenarios

KEY

Applicable

Applicable but might face significant challenges

Face significant challenges

Not relevant to the model

B. Technical complexity, connectedness and local capacity

FACTOR / OPERATING CONTEXT	PAGE	CBM1	CBM2	CBM3	CBM4	LG1	LG2	LG3	PB1	PV1	PV2
Low scheme technological complexity (for both operation and maintenance)	12	Applicable	Applicable	Applicable	Applicable	Applicable	Applicable	Applicable	Face significant challenges	Face significant challenges	Face significant challenges
Low complexity of scheme operation, but complex maintenance	12	Face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable	Face significant challenges	Applicable but might face significant challenges	Applicable	Applicable	Applicable	Applicable but might face significant challenges
Higher complexity of (daily) scheme operation, and complex maintenance	13	Face significant challenges	Face significant challenges	Face significant challenges	Applicable but might face significant challenges	Face significant challenges	Face significant challenges	Applicable	Applicable	Applicable	Applicable but might face significant challenges
High levels of service required (e.g. set performance indicators on pressure management, water quality, service outage, leakage management, and/or high rates of domestic connections)	13	Face significant challenges	Face significant challenges	Applicable but might face significant challenges	Applicable	Applicable but might face significant challenges	Face significant challenges	Applicable	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges
Low capacity (e.g. administrative, financial, organisational) of the local private sector to manage the schemes	13	Not relevant to the model	Not relevant to the model	Face significant challenges	Applicable	Not relevant to the model	Applicable	Face significant challenges	Not relevant to the model	Face significant challenges	Face significant challenges
Low capacity of the local service authority to provide timely and adequate technical support to the service provider	14	Applicable	Face significant challenges	Applicable but might face significant challenges	Applicable	Face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable	Applicable	Applicable
Low capacity of the service provider or contracting authority to develop and enforce contracts	14	Applicable	Face significant challenges	Face significant challenges	Applicable	Applicable	Applicable but might face significant challenges	Face significant challenges	Applicable	Face significant challenges	Applicable but might face significant challenges

The applicability of management models for piped water supply services in different scenarios

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Applicable

Applicable but might face significant challenges

Face significant challenges

Not relevant to the model

C. Sector policy, legislation and financing arrangements

FACTOR / OPERATING CONTEXT	PAGE	CBM1	CBM2	CBM3	CBM4	LG1	LG2	LG3	PB1	PV1	PV2
Unclear policy and legal framework for supporting Community Based Management (CBM)	15	Face significant challenges	Face significant challenges	Face significant challenges	Face significant challenges	Not relevant to the model	Not relevant to the model	Not relevant to the model	Not relevant to the model	Not relevant to the model	Not relevant to the model
Policy and legal framework, with supporting legislation, for public-private partnerships (PPP) or outsourcing of services not clear or well developed	15	Not relevant to the model	Not relevant to the model	Applicable	Not relevant to the model	Not relevant to the model	Not relevant to the model	Face significant challenges	Not relevant to the model	Face significant challenges	Applicable
Legal ownership of assets is poorly defined in sector legal framework	15	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Face significant challenges	Face significant challenges	Face significant challenges
The mandate for who can delegate management of public/ water supply assets is unclear	16	Applicable	Applicable	Face significant challenges	Applicable	Applicable	Not relevant to the model	Face significant challenges	Applicable	Face significant challenges	Applicable but might face significant challenges
The legal framework prevents the delegation of public or state-owned assets to the private sector or community operators	16	Not relevant to the model	Not relevant to the model	Face significant challenges	Not relevant to the model	Not relevant to the model	Face significant challenges	Face significant challenges	Applicable	Face significant challenges	Applicable
Financing for support to service authority and formal regulatory function is limited	16	Not relevant to the model	Face significant challenges	Applicable but might face significant challenges	Applicable	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable	Face significant challenges	Applicable but might face significant challenges
Sector financing guidelines unclear about responsibility for financing of capital maintenance	17	Face significant challenges	Face significant challenges	Face significant challenges	Face significant challenges	Face significant challenges	Face significant challenges	Applicable but might face significant challenges	Face significant challenges	Applicable but might face significant challenges	Applicable
Access to alternative financing sources through loans and (commerical) credit, as well as potentially through remittances	17	Face significant challenges	Face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable but might face significant challenges	Applicable	Applicable	Applicable	Applicable

The applicability of management models for piped water supply services in different scenarios

KEY

- Applicable
- Applicable but might face significant challenges
- Face significant challenges
- Not relevant to the model

D. Regulation and accountability mechanisms, local preferences, and ensuring inclusive services for all

FACTOR / OPERATING CONTEXT	PAGE	CBM1	CBM2	CBM3	CBM4	LG1	LG2	LG3	PB1	PV1	PV2
Management model enables equitable and inclusive service provision to all members of the community	18										
Management arrangements are gender sensitive and include women in key positions for greater sustainability	18										
No or limited formal regulation of rural water services by independent regulator	19										
Low capacity of the service authority to oversee and monitor service delivery or to fulfil delegated regulatory functions in absence of independent regulator	19										
Strong informal accountability mechanisms in place at the local level between local leaders, users and service providers, but weak formal regulatory processes by external (to the community) stakeholders	20										
Low public and political acceptance of private operators	20										
Low public confidence or acceptance of services being run (or managed) by local government or state utilities	21										
Low public confidence and local political acceptance of any 'outsiders' (i.e. external to the community, including public or private entities) running schemes and strong user preference for accountability of service providers to communities/households	21										

A. Commercial viability and economies of scale

CBM1	CBM2	CBM3	CBM4	LG1	LG2	LG3	PB1	PV1	PV2	Actions which could increase the viability of models identified as facing challenges or unviable
Community management	Community management plus			Local government			Public utility	Private		
Remote, rural, dispersed, small individual schemes, with limited potential for aggregation under one service provider										
Model is applicable, but will be undermined without external support	Appropriate where service authority can realistically provide external support	May be challenging to find private operator in remote rural settings	Limited potential for aggregated management	Unlikely to be appropriate where local government has insufficient resources to manage dispersed communities	Model may be applicable where contracts stipulate performance standards and external support is available	Schemes unlikely to be of interest to private operators unless bundled or subsidised	Schemes unlikely to be of interest to private operators unless bundled or subsidised	Schemes unlikely to be of interest to private operators unless bundled or subsidised	Schemes unlikely to be of interest to private operators unless bundled or subsidised	Strengthen the technical and administrative capacities of local service providers for observation and maintenance of the scheme. Strengthen the 'wider system' at the service authority level so they provide adequate external support to this service provider.
Multiple schemes bundled together under one service provider										
Unlikely to have adequate skills or external support to be able to aggregate effectively	Unlikely to have adequate skills or external support	Aggregation may be possible if schemes are close together but not if far apart	Model is based on principle of aggregation	Only appropriate where local government has adequate capacity and resources	Allows for greater economies of scale and operating efficiencies, but requires high level of professional management	Allows for greater economies of scale and operating efficiencies	Allows for greater economies of scale and operating efficiencies	Allows for greater economies of scale and operating efficiencies	Allows for greater economies of scale and operating efficiencies	Undertake studies and surveys to develop the evidence on which decisions on bundling schemes can be based, and support consultations with stakeholders on this. Ensure selection of schemes does not just pick the most commercially viable schemes, to the detriment of services in surrounding schemes.
Low to medium potential to generate sufficient tariff revenue to meet operating costs										
Possibility to draw on voluntary labour and community contributions to offset tariff shortfall	Possibility to draw on voluntary labour and community contributions to offset tariff shortfall	Problematic and not commercially viable for private operators	Possibility to cross-subsidise	Possibility to cross-subsidise in larger networked areas or to provide public subsidies	Possibility to inject public subsidies, but unsustainable in the long term	Problematic and not commercially viable for private operators	Possibility to cross-subsidise in larger networked areas or to provide public subsidies	Possibility to cross-subsidise in larger networked areas or to provide public subsidies	Problematic and not commercially viable for private operators	Efforts to strengthen the financial viability of the scheme could include: capital investments to the scheme to ensure it is well functioning and to reduce upcoming O&M costs; identifying users' willingness and ability to pay for services to ascertain the viability of tariff increases; facilitating users' ability to obtain domestic connections, to increase volumetric consumption; carrying out measures to reduce levels of non-revenue water.

A. Commercial viability and economies of scale



Medium to high potential to generate surplus from tariff revenue to meet operating costs and potentially some aspects of capital maintenance

Very unlikely to be able to generate surplus where tariffs are not based on some level of cost recovery and revenue collection is infrequent and/or partial	Unlikely to be able to generate surplus where tariffs are not based on some level of cost recovery and revenue collection is infrequent and/or partial	Unlikely to be able to generate surplus where tariffs are not based on some level of cost recovery and revenue collection is infrequent and/or partial	Potential to generate surplus through tariff setting based on some level of cost recovery and cross subsidy which could be reinvested in capital maintenance	Unlikely to maximise potential to generate surplus unless tariffs reflect some level of cost recovery	Unlikely to maximise potential to generate surplus unless tariffs reflect some level of cost recovery	While there is potential to generate surplus that could be re-invested, delegated private operators also present an additional cost and may seek to extract revenue that would otherwise be available to fund maintenance	If management is efficient, profits are re-invested, technology innovations are taken up and cost control measures put into place, possible to generate surplus	Likely to generate surplus, but unless lease contracts are well designed and enforced, potential for private investors to extract profits may undermine ability to cover capital maintenance requirements over long term	Likely to generate surplus, but unless managed effectively and profits re-invested, unlikely to be able to cover capital maintenance requirements, especially where private investors extract profits	Work with service providers and management entities to ensure surplus generated through tariff revenues is ring-fenced and re-invested in capital maintenance interventions. Support providers to establish bank accounts and develop forecasts for capital investment planning (links with asset management).
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Greater proximity to higher density urban or peri-urban centres, with potential to be networked with urban utilities, either physically or through aggregated or umbrella management arrangements

Unlikely this model will be relevant where there is potential for utility management	Unlikely this model will be relevant where there is potential for utility management	Unlikely this model will be relevant where there is potential for utility management	Unlikely this model will be relevant where there is potential for utility management	Potential for this model to work well where there is effective municipal management and revenue streams can be ring-fenced, but dependent on commitment of local authority	Potential for this model to work well where there are well designed and enforceable lease contracts and where CBM is effective in scheme management	Allows for greater economies of scale and operating efficiencies where private sector management is effective and where lease contracts are well designed and enforceable	Allows for greater economies of scale and operating efficiencies where private sector management is effective and where lease contracts are well designed and enforceable	Allows for greater economies of scale and operating efficiencies where private sector management is effective and where lease contracts are well designed and enforceable	Allows for greater economies of scale and operating efficiencies where private sector management is effective and where lease contracts are well designed and enforceable	Where appropriate, encourage larger utilities (and the line ministries that oversee them) and asset holders to provide incentives to extend networks into adjacent rural areas and/or establish umbrella management entities linked to the utilities that can provide more professional aggregated management of smaller rural schemes in these areas.
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A. Commercial viability and economies of scale



Low interest of utilities or private sector to assume some or all aspects of scheme management

Not relevant to model – model does not involve utilities or private sector actors	Not relevant to model – model does not involve utilities or private sector actors	Likely to undermine model relying on private operator capacity	Not relevant to model – model does not involve utilities or private sector actors	Not relevant to model – model does not involve utilities or private sector actors	Not relevant to model – model does not involve utilities or private sector actors	Likely to undermine model relying on private operator capacity	Likely to undermine model relying on public utility	Likely to undermine model relying on private operator capacity	Likely to undermine model relying on private operator capacity	Carry out studies to determine the commercial viability of the scheme and understand non-commercial barriers to external engagement. Seek to address such constraints with the community and service provider. Explore alternative service options that may be more applicable in this context i.e. self-supply
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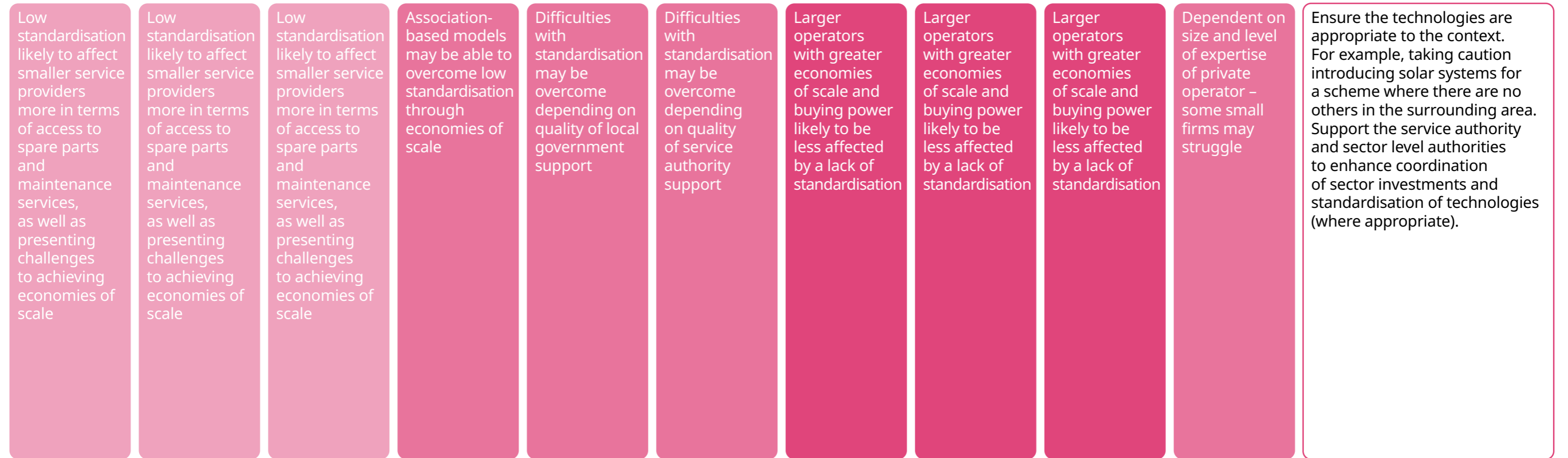
High interest of utilities or private sector to assume some or all aspects of scheme management

Not relevant – model does not involve utilities or private sector actors	Not relevant – model does not involve utilities or private sector actors	Likely to be attractive, but limited potential for private sector to maximise profits	Not relevant – model does not involve utilities or private sector actors	Not relevant – model does not involve utilities or private sector actors	Not relevant – model does not involve utilities or private sector actors	Incentive for private sector involvement	Incentive for public utility involvement	Incentive for private sector involvement	Incentive for private sector involvement	Where appropriate, encourage larger utilities (and the line ministries that oversee them) and asset holders to provide incentives to extend networks into adjacent rural areas. And/or establish umbrella management entities linked to the utilities that can provide more professional aggregated management of smaller rural schemes in these areas. Where required, identify and support capacity building needs
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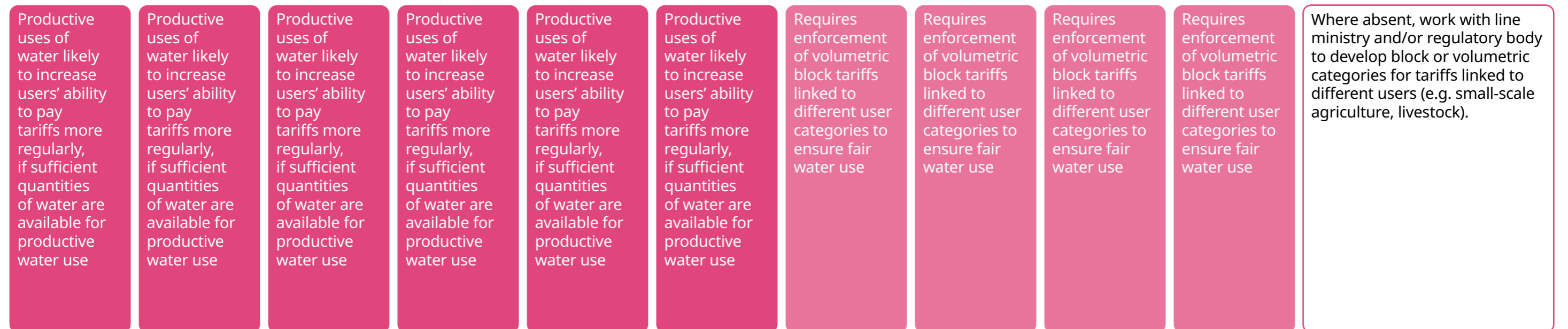
A. Commercial viability and economies of scale



Low standardisation of technologies in an area



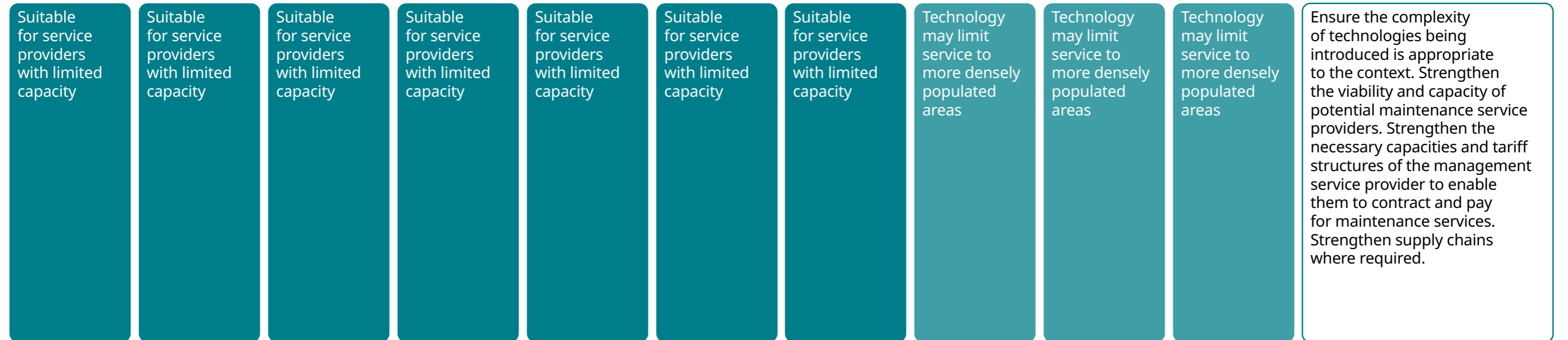
Scheme integrated with alternative, economic uses of water



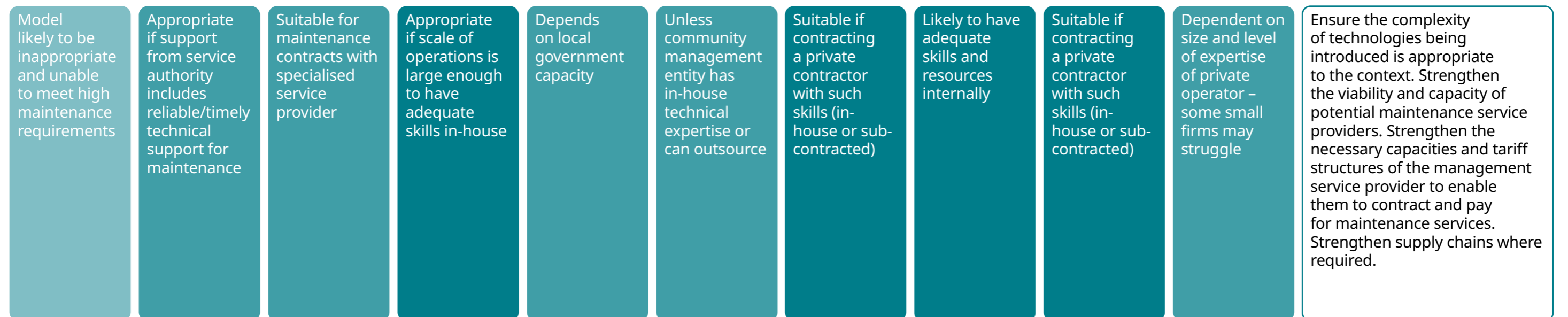
B. Technical complexity, connectedness and local capacities



Low scheme technological complexity (for both operation and maintenance)



Low complexity of scheme operation, but complex maintenance



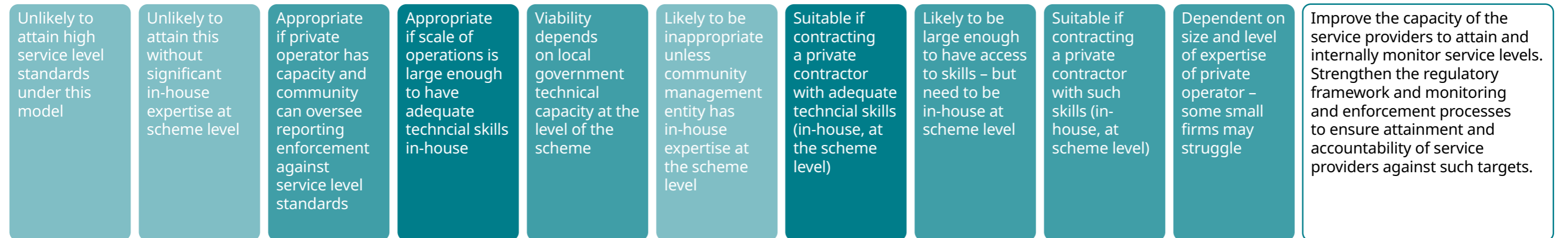
B. Technical complexity, connectedness and local capacities



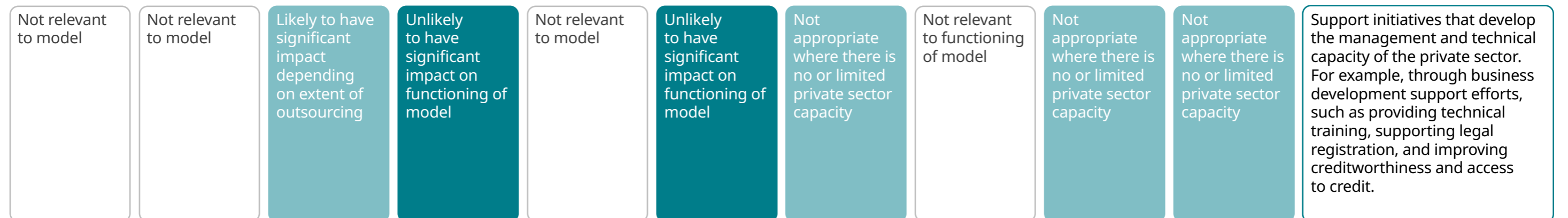
Higher complexity of (daily) scheme operation, and complex maintenance



High levels of service required (e.g. set performance indicators on pressure management, water quality, service outage, leakage management, and/or high rates of domestic connections)



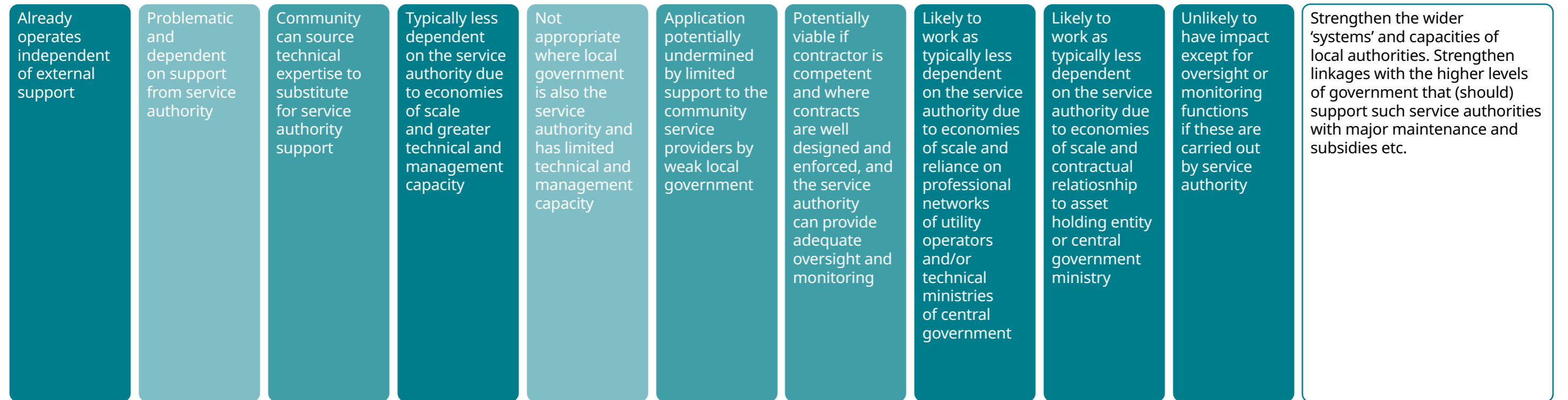
Low capacity (e.g. administrative, financial, organisational) of the local private sector to manage the schemes



B. Technical complexity, connectedness and local capacities



Low capacity of the local service authority to provide timely and adequate technical support to the service provider



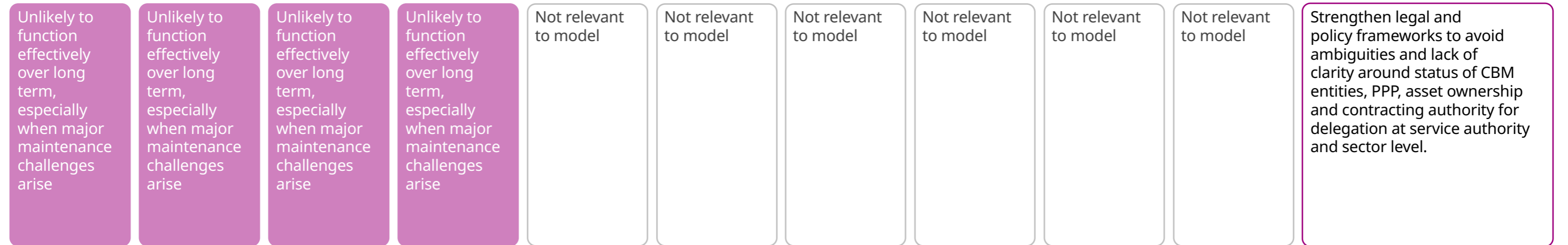
Low capacity of the service provider or contracting authority to develop and enforce contracts



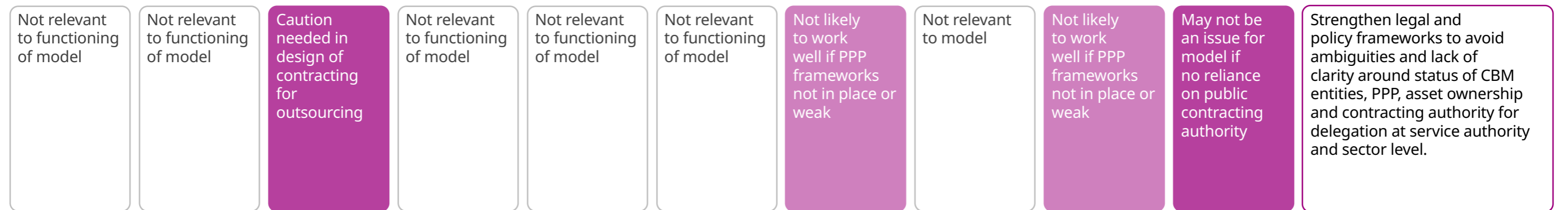
C. Sector policy, legislation and financing arrangements



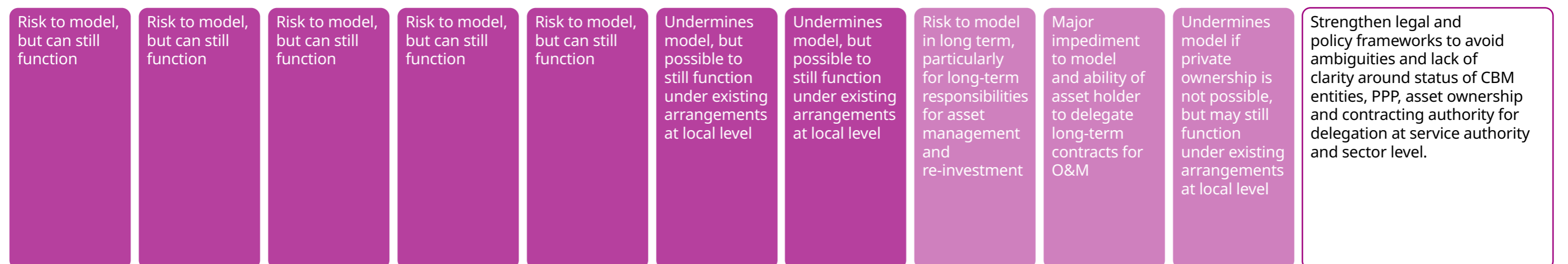
Unclear policy and legal framework for supporting Community Based Management (CBM)



Policy and legal framework, with supporting legislation, for public-private partnerships (PPP) or outsourcing of services not clear or well developed



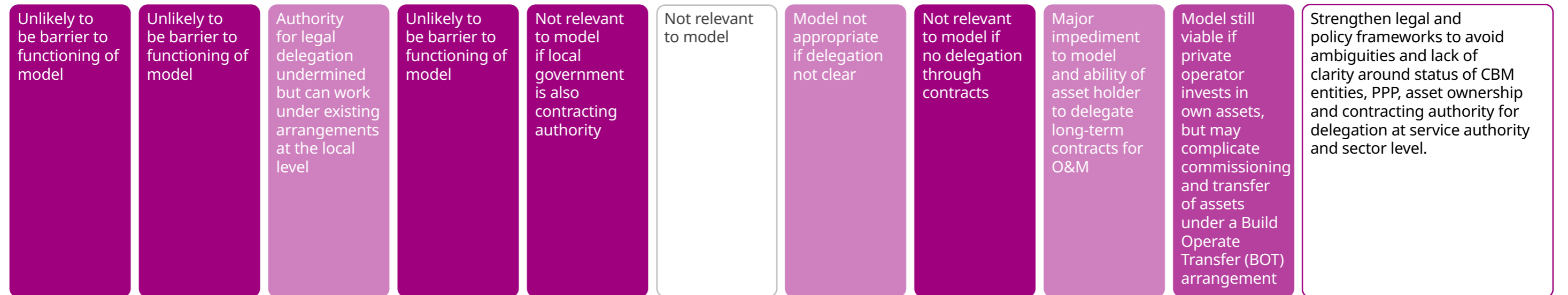
Legal ownership of assets is poorly defined in sector legal framework



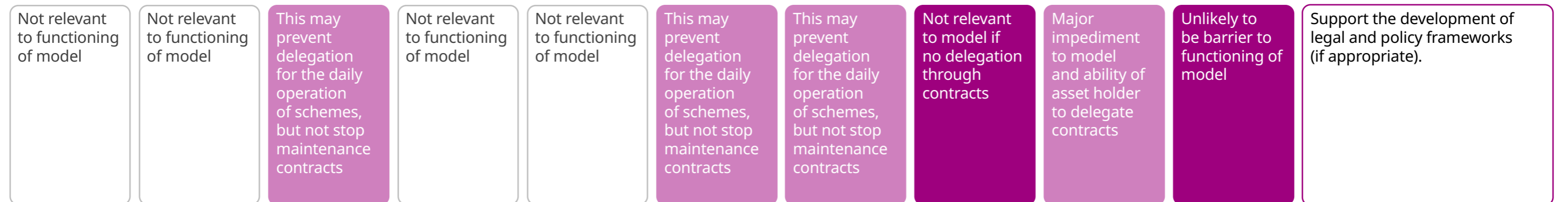
C. Sector policy, legislation and financing arrangements



The mandate for who can delegate management of public/water supply assets is unclear



The legal framework prevents the delegation of public or state-owned assets to the private sector or community operators



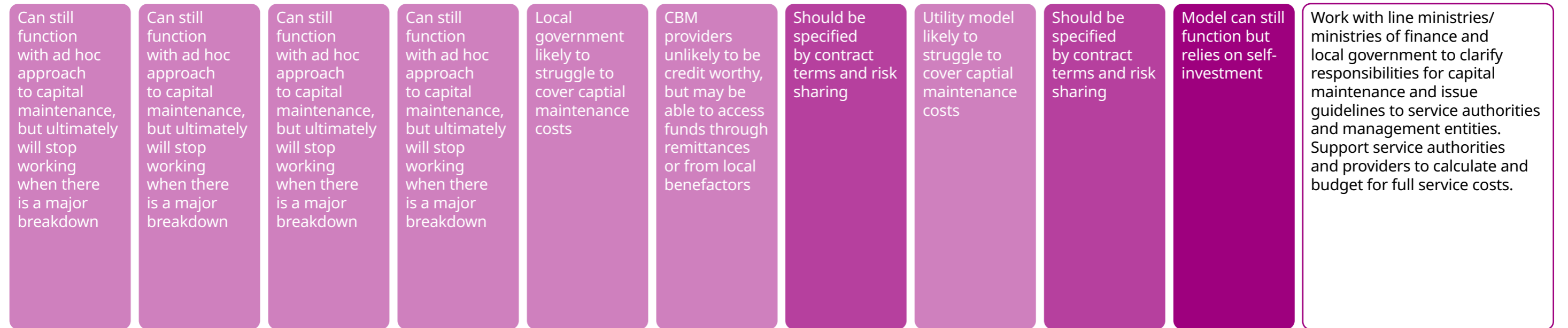
Financing for support to service authority and formal regulatory function is limited



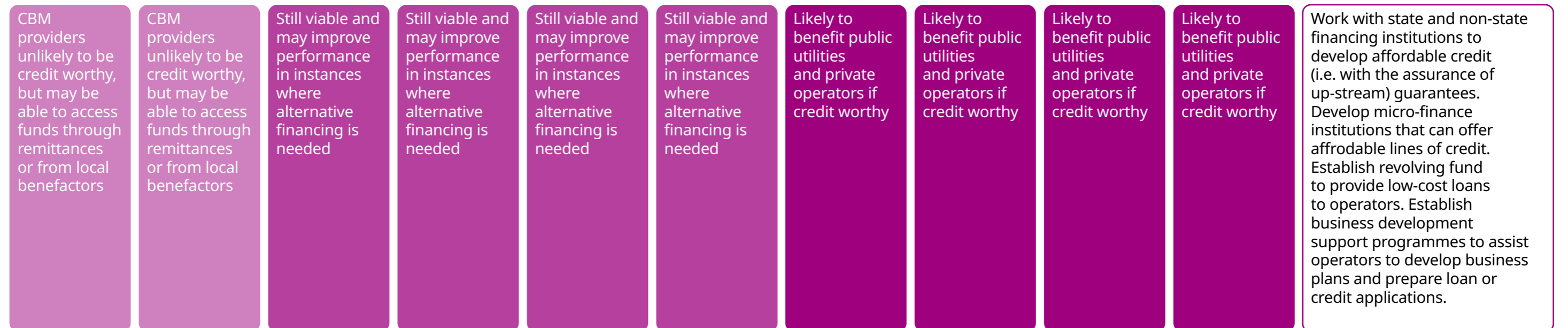
C. Sector policy, legislation and financing arrangements



Sector financing guidelines unclear about responsibility for financing of capital maintenance



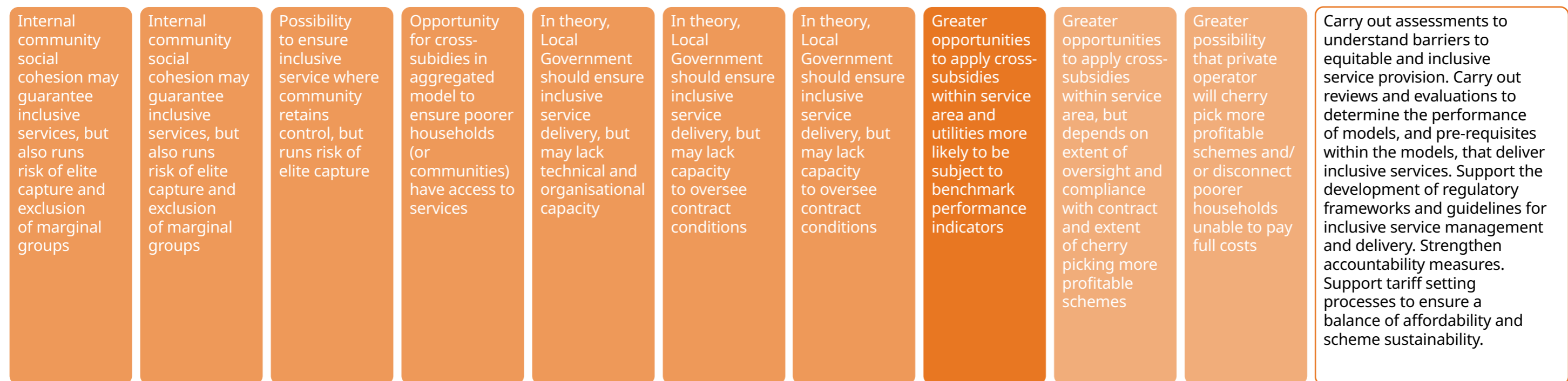
Access to alternative financing sources through loans and (commercial) credit, as well as potentially through remittances



D. Regulation and accountability mechanisms, local preferences, and ensuring inclusive services for all



Management model enables equitable and inclusive service provision to all members of the community



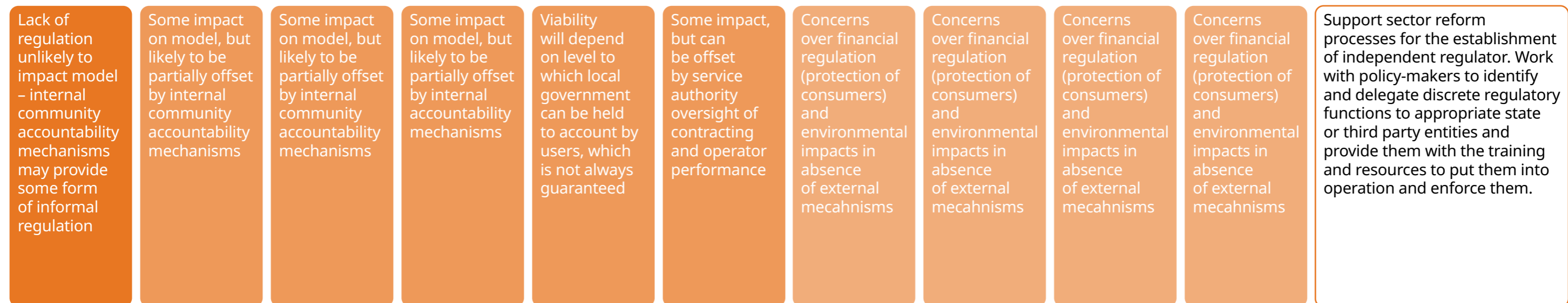
Management arrangements are gender sensitive and include women in key positions for greater sustainability



D. Regulation and accountability mechanisms, local preferences, and ensuring inclusive services for all



No or limited formal regulation of rural water services by independent regulator



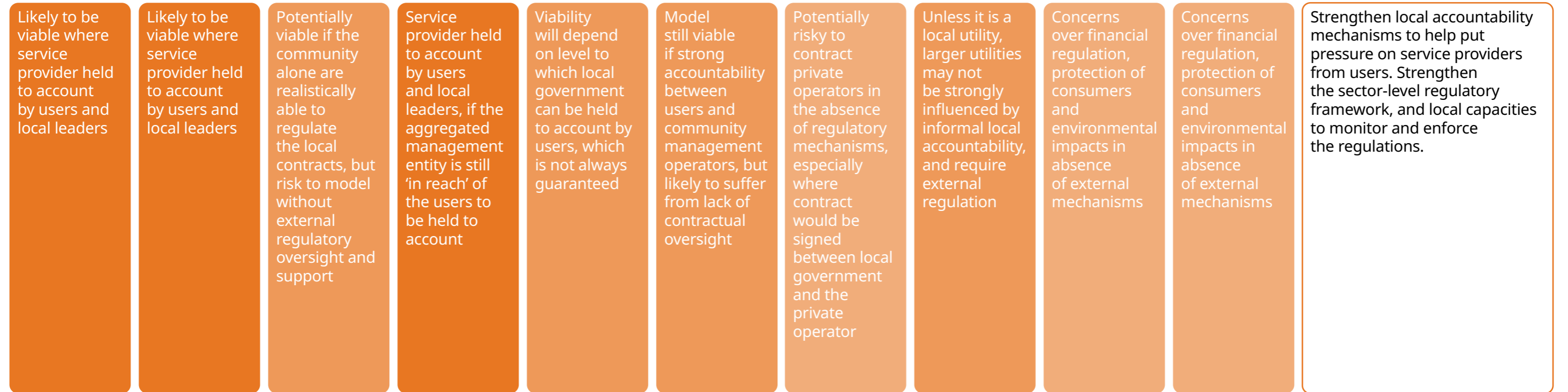
Low capacity of the service authority to oversee and monitor service delivery or to fulfil delegated regulatory functions in absence of independent regulator



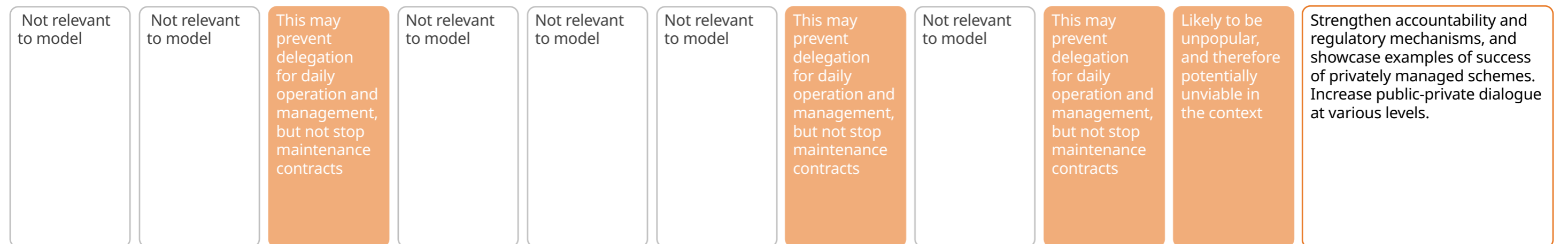
D. Regulation and accountability mechanisms, local preferences, and ensuring inclusive services for all



Strong informal accountability mechanisms in place at the local level between local leaders, users and service providers, but weak formal regulatory processes by external (to the community) stakeholders



Low public and political acceptance of private operators



D. Regulation and accountability mechanisms, local preferences, and ensuring inclusive services for all



Low public confidence or acceptance of services being run (or managed) by local government or state utilities

Not relevant to model	Not relevant to model	Not relevant to model	Not relevant to model	Likely to undermine trust and acceptance of model leading to operational challenges	Low public confidence in local government may be mitigated by delegating O&M and management functions to a community entity	Potentially unpopular if community does not trust in the local authority's capacity to regulate the contracted operator	Probably unviable unless the utility is localised, includes community representation in its governance structure, and is accountable to the community	Potentially unpopular if the community does not trust in the mandated authority's capacity to regulate the contracted operator	Not relevant to model	Strengthen capacities and systems for state contracted or delivered service provision. Strengthen regulatory and accountability mechanisms – particularly 'downwards' accountability arrangements from government to users.
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Low public confidence and local political acceptance of any 'outsiders' (i.e. external to the community, including public or private entities) running schemes and strong user preference for accountability of service providers to communities/households

Likely to reinforce underlying principles of management model	Likely to reinforce underlying principles of management model	Acceptance of this model may depend on how 'local' the private operator is, and whether the contract is for operation or only for periodic maintenance	Potentially viable, unless there are concerns that the aggregated management entity moves the 'control' away from the community	Unlikely to work well unless the local government is highly decentralised or viewed as a champion of local population	May create problems or tension between contracting authority and communities	Likely to be unpopular, unless there are strong accountability mechanisms available to users	Likely to be unpopular, unless the utility is locally managed and accountable to communities	Likely to be unpopular, unless there are strong mechanisms for accountability to users	Likely to be unpopular, unless there are strong mechanisms for accountability to users	Strengthen local accountability mechanisms. Demonstrate to the community the success of alternative models. Increase accountability and customer orientation of potential 'external' service providers.
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Cover images:

Left: WaterAid/ James Kiyimba

Right: WaterAid/ Basile Ouedraogo

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