Learning in 21st Century Schools

Comparative analysis of school infrastructure planning and management systems in 12 countries in Latin America and the Caribbean

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The objective of this study is to compare and promote improvements in planning, construction and maintenance processes for school infrastructure in 12 Latin American countries.

Background

The IDB and 12 countries participating in the "Learning in 21st Century Schools" project are interested in conducting a **comparative study of planning and project delivery systems to build and maintain public school infrastructure (at the K-12 level)**, in order to compare processes between countries and identify best practices as well as common obstacles and bottlenecks.

Main goal of the study

Serve as a basis for discussion and exchange of ideas and experiences on how to:

- **Strengthen the capacity of technical teams** working on planning and management of school infrastructure projects.
- **Improve efficiency in school infrastructure planning and construction processes**.
- **Improve the use of school spaces and their suitability** to pedagogical and organizational needs.

The study was mainly based on in-depth interviews to the technical liaisons of 12 participating countries.

Methodology

Literature review

Information gathering on each country via public sources and interviews to countries' technical liaisons.

1. Development of country profiles based on information from public sources.
2. Initial interview with each technical liaison.
3. Review of documents and information provided by the technical liaison.
4. Follow-up interviews (one to three per country).
5. Development of "country information fact sheets."

Analysis and summary of findings

Workshop in Antigua, Guatemala

Completion of documents, including feedback from workshop's participants

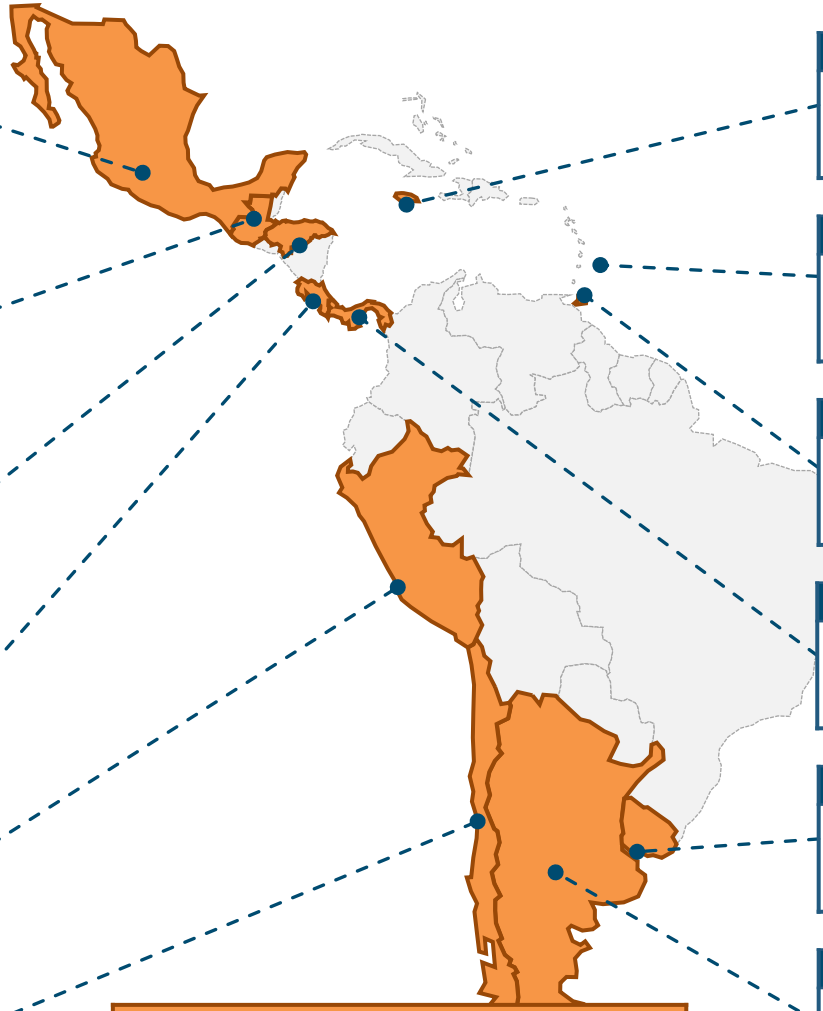
Study limitations

Due to time and resource constraints, the analysis included only processes managed at the national level.

In some cases, it was not possible to obtain sufficient information to make a thorough analysis of all the relevant processes.

The accuracy of the information in the fact sheets was validated only by each country's technical liaison. No other validation process was carried out.

The study reviewed policies and processes for school infrastructure management of 12 countries in Latin America and the Caribbean.



MEXICO (MEX)
Population: **123.8 million**
GDP/capita: **$10,361** USD
%GDP spent on education : **5.15%**

GUATEMALA (GTM)
Population : **15.9 million**
GDP/capita : **$3,703** USD
%GDP spent on education : **2.85%**

HONDURAS (HON)
Population : **8.2 million**
GDP/capita : **$2,347** USD
%GDP spent on education : **5.86%**

COSTA RICA (CRI)
Population : **4.9 million**
GDP/capita : **$10,035** USD
%GDP spent on education : **7.5%**

PERU (PER)
Population : **30.8 million**
GDP/capita : **$6,594** USD
%GDP spent on education : **3.28%**

CHILE (CHL)
Population : **17.8 million**
GDP/capita : **$14,520** USD
%GDP spent on education : **4.55%**

JAMAICA (JAM)
Population : **2.7 million**
GDP/capita : **$5,290** USD
%GDP spent on education : **6.26%**

BARBADOS (BRB)
Population : **0.3 million**
GDP/capita : **$15,199** USD
%GDP spent on education : **5.6%**

TRINIDAD & TOBAGO (TTO)
Population : **1.3 million**
GDP/capita : **$18,219** USD
%GDP spent on education : **3.16%**

PANAMA (PAN)
Population: **3.9 million**
GDP/capita : **$11,771** USD
%GDP spent on education : **3.29%**

URUGUAY (URY)
Population : **3.4 million**
GDP/capita : **$16,810** USD
%GDP spent on education : **4.42%**

ARGENTINA (ARG)
Population : **41.8 million**
GDP/capita : **$12,922** USD
%GDP spent on education : **5.14%**

General Range
Population: **0.3 million → 123.8 million**
GDP/capita: **$2,347 USD → $18,219 USD**
%GDP spent on education : **2.85% → 7.5%**

This 12 countries face different problems and challenges, depending on their population needs and education policies.

MEXICO (MEX)
Population growth in 2025 (0-14): **-3.5%**
Out-of-school rate (primary): **2%**
Years of compulsory education : **15**
Full-time schooling: **In process**

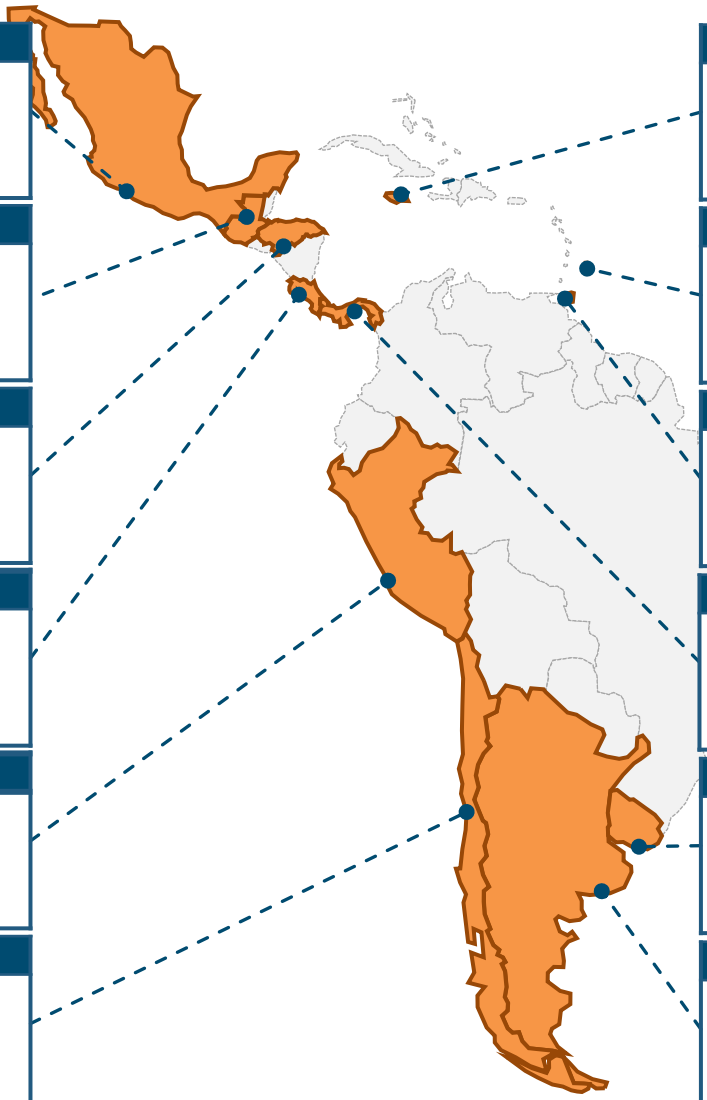
GUATEMALA (GTM)
Population growth in 2025 (0-14): **7.32%**
Out-of-school rate (primary): **12%**
Years of compulsory education : **9**
Full-time schooling: -

HONDURAS (HON)
Population growth in 2025 (0-14): **-5.36%**
Out-of-school rate (primary): **9.9%**
Years of compulsory education : **13**
Full-time schooling: **In process**

COSTA RICA (CRI)
Population growth in 2025 (0-14): **-5.18%**
Out-of-school rate (primary): **9%**
Years of compulsory education : **14**
Full-time schooling: -

PERU (PER)
Population growth in 2025 (0-14): **0.51%**
Out-of-school rate (primary): **5.6%**
Years of compulsory education : **9**
Full-time schooling: **In process**

CHILE (CHL)
Population growth in 2025 (0-14): **-3.17%**
Out-of-school rate (primary): **8%**
Years of compulsory education : **13**
Full-time schooling: -



JAMAICA (JAM)
Population growth in 2025 (0-14): **-4.25**
Out-of-school rate (primary): **8.4%**
Years of compulsory education : **14**
Full-time schooling: **In process**

BARBADOS (BRB)
Population growth in 2025 (0-14): **-4.04%**
Out-of-school rate (primary): **3%**
Years of compulsory education : **14**
Full-time schooling: -

TRINIDAD & TOBAGO (TTO)
Population growth in 2025 (0-14): **-8.18%**
Out-of-school rate (primary): **1%**
Years of compulsory education : **15**
Full-time schooling: -

PANAMA (PAN)
Population growth in 2025 (0-14): **3.6%**
Out-of-school rate (primary): **8.7%**
Years of compulsory education : **11**
Full-time schooling: -

URUGUAY (URY)
Population growth in 2025 (0-14): **-3.92%**
Out-of-school rate (primary): **0%**
Years of compulsory education : **10**
Full-time schooling: **In process**

ARGENTINA (ARG)
Population growth in 2025 (0-14): **1.28%**
Out-of-school rate (primary): **0.9%**
Years of compulsory education : **14**
Full-time schooling: **In process**

The Out-of-School rate is calculated as the proportion of all children of school-going age that are NOT ENROLLED in formal education. UNESCO, UIS y UNICEF, Fixing the broken promise of education for all. Findings from the Global Initiative on Out-Of-School Children, Canada, 2015, p 127.

Most countries need to build new infrastructure and/or maintain the existing one. However, maintenance needs are not as highly prioritized as they should be in several countries.

Given that the population for the age group 0 to 14 is decreasing in most of the analyzed countries, infrastructure policies will need to focus on **improving enrollment for the current population, establishing full-time schooling, and maintaining and refurbishing existing infrastructure**. Some countries have also prioritized increasing access and school infrastructure quality in rural and less-developed areas.

Priorities for infrastructure needs	ARG	BRB	CHL	CRI	GTM	HON	JAM	MEX	PAN	PER	TTO	URY
NI: Increase enrollment: **Preschools and kindergartens** (3-5 years old)	✓	✓	👁		✓	✓	✓	✓	✓			✓
NI: Increase enrollment: **Elementary / primary** (6-12 years old)	✓		✓	👁	👁				✓	👁		
NI: Increase enrollment: **Secondary / middle school** (12-14 years old)	✓	✓	👁	👁	✓	✓			👁			✓
NI: Increase coverage and quality: Focus on **rural areas**	✓			✓		✓	✓		✓			
NI: Increase school capacity: Establishing **full-time schooling**	✓					✓	✓	✓	✓	✓		✓
NI: Increase school capacity: **Population growth** for 2025 (0-14 years old)					👁				👁			
M: Refurbish **deteriorated infrastructure**		✓		✓	✓	✓		✓	⚠	✓	✓	
M: **Better maintenance** of existing infrastructure	⚠	⚠	✓	✓	✓	⚠	⚠	⚠	⚠		✓	⚠

NI New Infrastructure
M Maintenance

✓ Considered in current policies

⚠ Perceived as necessary to be considered in current policies

👁 Identified as a need based on statistics

FRAMEWORK: Analysis of school infrastructure management processes from planning and building new infrastructure to routine and extraordinary maintenance.

NEW SCHOOL INFRASTRUCTURE

Considers construction of new school buildings (or additions to existing buildings). This usually responds to demographic requirements (population growth) as well as policy priorities, such as the extension of compulsory education or the decision to implement full-time schooling.
For practical purposes, the analysis separates planning processes (project definition) from construction processes.

PLANNING for new infrastructure

This category take on processes covering from the needs assessment to the approval and budget allocation for each project.

CONSTRUCTION of new infrastructure

This category considers project delivery processes from tender/bidding stages and selection of contractors to the final delivery.

SCHOOL INFRASTRUCTURE MAINTENANCE

School infrastructure maintenance increases the lifespan of existing buildings.

ROUTINE Maintenance

This includes periodic maintenance actions (corrective and preventive) that do not require specific technical skills or a big budget. Routine maintenance is typically carried out by schools' staff or local community.

EXTRAORDINARY Maintenance

This includes extensive actions for maintenance or refurbishment that typically require specific technical skills as well as a significant budget. Extraordinary maintenance works are often managed through similar processes than those used for new infrastructure projects. Some countries use abbreviated processes for smaller maintenance projects.

PLANNING process for new infrastructure: Key components

Based on the literature review and interviews with technical liaisons, some key components were identified to guide the analysis and comparison between countries.

PLANNING process for new infrastructure

A. Existence of a national policy for school infrastructure with clear objectives
B. Use of an institutionalized strategy to identify and prioritize needs
C. Availability and use of georeferenced information on demographics and school infrastructure
D. Use of efficient processes for land identification and acquisition
E. Existence of specific regulations and standards for school infrastructure design
F. Availability and use of prototypes and project designs to help estimate costs for school infrastructure

PLANNING process for new infrastructure: Compliance with key components

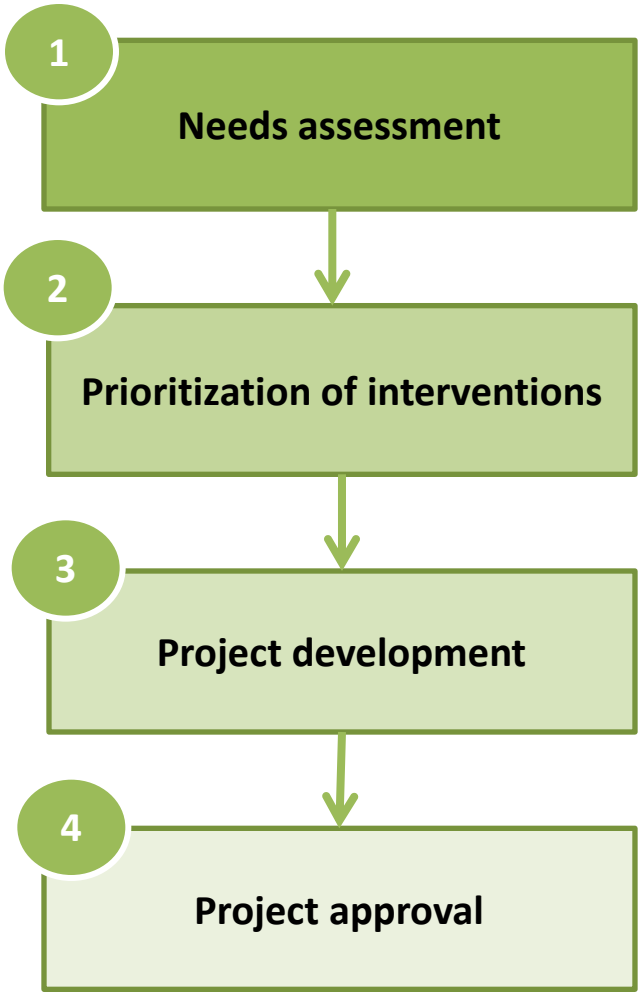
Almost all countries have national policies for school infrastructure, and specific norms and regulations to guide school design. Also, it is very common to have a strategy to identify and prioritize needs. Nearly half of the analyzed countries either have or are in the process of creating an information system to organize data on demographics and existing school infrastructure. The majority of these countries lack efficient processes to acquire and/or consolidate land necessary to build new school infrastructure.

Key components	ARG	BRB	CHL	CRI	GTM	HON	JAM	MEX	PAN	PER	TTO	URY
A. National policy for school infrastructure with clear objectives	●		●	●	●	●	●	○	●	●		●
B. Institutionalized strategy to identify and prioritize needs	●			●	●	●		○	●			●
C. Georeferenced information on demographics and school infrastructure	○					●		●		○		●
D. Efficient processes for land identification and acquisition						○		●				
E. Specific regulations and standards for school infrastructure design	○	●	●	●	●	●	○	●	●	●	○	●
F. Prototypes and project designs to help estimate costs for school infrastructure	○			●	●	●		○				●

● Complies ○ In process or complies with some parts of the component, but not all Does not comply or data not available

PLANNING process for new infrastructure: Management processes

Although planning for new infrastructure varies in each country, usually management processes follow these four main steps:



The need for new school infrastructure, including new buildings and additions to existing infrastructure, is identified.

Identified needs are prioritized based on different considerations and methodologies.

The capital plan for each project is developed, including design considerations and detailed budget.

Various agencies evaluate and approve the project based on a number of criteria and methodologies. Budget is officially allocated.

PLANNING process for new infrastructure: Needs assessment and prioritization

Management models for needs assessment and prioritization can be organized according to the key stakeholders involved in the process and the scope of their responsibilities. At the same time, these models take on different decision-making approaches throughout the planning process.

1 Needs assessment

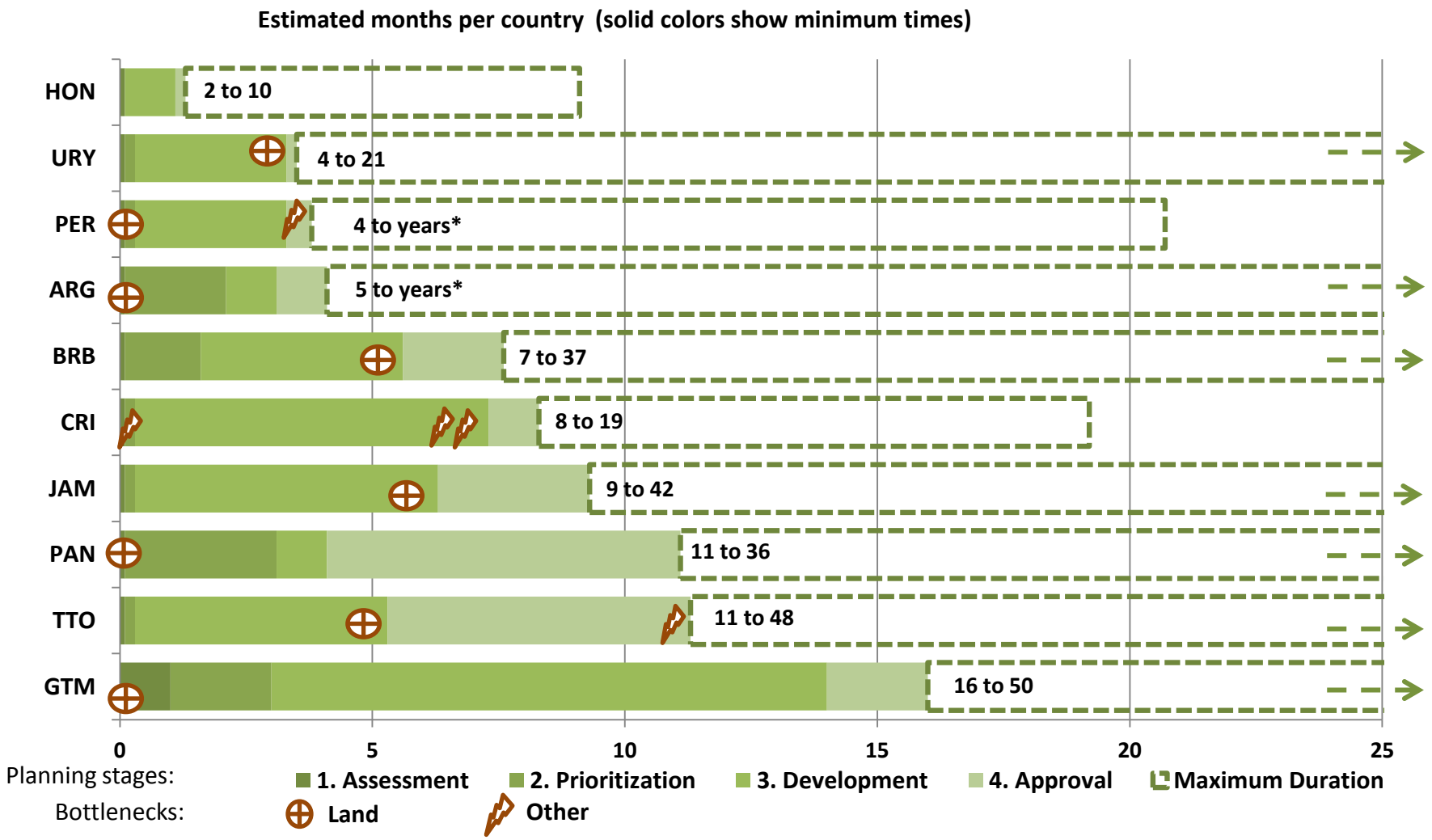
1. Needs are detected **at the regional or local level**.	Argentina, Chile, Costa Rica, Guatemala, Honduras, Mexico, Panama
2. Needs are detected **at the national level**.	Barbados, Jamaica, Peru, Trinidad & Tobago, Uruguay

2 Prioritization of interventions

1. **Automated prioritization** system for school infrastructure. The prioritization is done almost immediately after the needs assessment.	Argentina, Honduras, Uruguay, Costa Rica
2. **Prioritization** system **determined by Ministry of Education** at the national and / or regional level (non-automated).	Barbados, Jamaica, Mexico*, Panama, Peru, Trinidad & Tobago
3. **Centralized prioritization** system **for all types of infrastructure** (e.g. National Infrastructure System).	Chile, Guatemala

* Mexico has an automated prioritization system but it is not used for new infrastructure. Instead, it only applies to major maintenance needs.

PLANNING process for new infrastructure: Work schedules



Note: In Mexico, the planning process is managed by each state (region) differently. Therefore it is not considered in this graph.

It was not possible to obtain the full data on Chile, therefore it is not included on this graph.

* Argentina and Panama mentioned that it takes years to get suitable land for school infrastructure, but did not specify the timeframe.

PLANNING process for new infrastructure: Main bottlenecks

	Main bottlenecks	Affected countries	Good practices
Land related	Long periods of time to **acquire or consolidate land**	9 countries Argentina, Barbados, Chile, Guatemala, Jamaica, Panama, Peru, Trinidad & Tobago, Uruguay	Argentina, Chile, Panama and Peru must have legalized land in order to begin the prioritization process.
	Complex processes for **land legalization**	5 countries: Argentina, Guatemala, Honduras, Panama and Peru	
	Limited availability of land in areas where new school facilities are needed	3 countries Argentina, Chile, Panama	
Other	Delays in the process of **outsourcing providers** for design development	3 countries Barbados, Costa Rica, Peru	Guatemala, Honduras and Uruguay have prototype designs and / or standard types that speed up design and budgeting.
	Staff shortages at the state agencies to take on all the identified needs	3 countries Barbados, Costa Rica, Panama	
	Red tape or delays in **institutional approvals**	1 country Trinidad & Tobago	

PLANNING process for new infrastructure: Stakeholders

The 12 analyzed countries involve various stakeholders in their planning processes. For example, in Uruguay, only education authorities (regional and national) make decisions, whereas in Honduras there are at least 5 different stakeholders involved in school infrastructure planning. There is no clear relationship between the number of stakeholders and planning efficiency.

	Stakeholders	ARG	BRB	CHL	CRI	GTM	HON	JAM	MEX	PAN	PER	TTO	URY
National	National Congress / Cabinet		■					■				■	
	Ministry of Education (or corresponding education authority)	■	■	■	■	■	■	■		■	■	■	■
	Ministries other than Education	■	■	■	■		■	■		■	■	■	
Regional	Regional government entities	■				■					■		
	Regional offices of the Ministry of Education				■	■				■			■
Local	Municipalities / Local governments			■			■						
	School principals/boards		■				■	■			■	■	
	School community		■		■	■				■			
Other	International agencies		■			■	■						
	Contractors				■			■			■		
Total TYPES of Stakeholders		**3**	**6**	**3**	**5**	**5**	**5**	**5**		**4**	**5**	**4**	**2**
Estimated time (months)		4	12-37	7	9 - 19	16-26	2-10	9-36		5	4-13	13–49	4-28

Note: In Mexico, the planning process is managed differently in each state (region). Therefore it is not considered on this analysis.

PLANNING process for new infrastructure: Common challenges

The most common challenges perceived in school infrastructure planning are: red tape on land acquisition (9 countries), the lack of updated information (8 countries), and complex processes to legalize land (5 countries).
Other common challenges include the lack of effective systems to identify and prioritize needs (5 countries), not having enough personnel to manage administrative systems and deal with needs that arise (3 countries), and the lack of suitable land for new construction (3 countries).

Perceived challenges	ARG	BRB	CHL	CRI	GTM	HON	JAM	MEX	PAN	PER	TTO	URY
Understaffed administrative systems		x		x					x			
Rigid or rarely updated budget												x
Budget dragged from one year to another			x					x				
Lack of an effective system to identify and prioritize needs		x	\				x			x	x	
School infrastructure information is rarely or not at all updated	x	x		x	x		x		x	x	x	
Lack of suitable land for school needs	x		x						x			
Long process for land acquisition	x	x	x		x		x		x	x	x	x
Complex process for legalizing land	x				x	x			x	x		

x Challenge \ Not a major challenge Not a challenge or data not available

PLANNING process for new infrastructure: Good practices

These good practices are not exhaustive, but they serve to illustrate interesting and innovative processes and models.

Good practices

- Use **georeferenced digital systems** focused on school infrastructure needs to help identify and prioritize interventions (Honduras, Uruguay).
- Promote a strong **connection between school infrastructure planning and education stakeholders** through frequent meetings (Uruguay, Argentina).
- Have a **decentralized and autonomous agency to supervise school infrastructure planning** to provide more transparent and efficient processes (Mexico).
- **Isolate school infrastructure budget or define funds to prevent financial drainage** due to corruption and / or other types of misuse (Honduras, Mexico).
- Use **design prototypes for projects** to speed up the planning and budgeting process. The prototypes must be flexible enough to adapt to different conditions (Guatemala, Honduras, Costa Rica, Uruguay).
- **Multi-annual budgets** can prevent the problem of resource constraints and project dragging through several financial years (Costa Rica).
- **Merge nearby small schools to have fewer (but bigger) schools** or support "School Networks" where several nearby schools share facilities. This can offer a wider range of learning spaces for students (science labs, sports fields, media labs, specialized teachers, etc.) given limited resources. In this case, investment in transportation should be considered in addition to the investment in infrastructure (Honduras).
- Taking **legal actions to facilitate acquisition, legalization and transfer** of land for school construction (Honduras, Mexico).

CONSTRUCTION process for new infrastructure: Key components

Based on literature and interviews, some key components were identified to guide the analysis and comparison between countries.

CONSTRUCTION process of new infrastructure

A. Clear and efficient procurement and tendering processes are set

B. Local capacity for professional and technical teams

C. Community participation in decision-making process and project delivery

D. Construction supervision and budget monitoring

CONSTRUCTION process for new infrastructure: Compliance with key components

All of the reviewed countries have a system that supervises performance and monitors the use of resources, and many declared that their procurement and tendering processes are clear and efficient. Many of these countries believe that there is sufficient local capacity to implement school infrastructure projects.

Only Honduras includes meaningful community participation during the construction process. Also only Barbados established that there are no clear and efficient procurement and tendering processes.

Key components	ARG	BRB	CHL	CRI	GTM	HON	JAM	MEX	PAN	PER	TTO	URY
A. Clear and efficient procurement and tendering processes	●		●	●	●	●	●		○	●	●	●
B. Local capacity for professional and technical teams	●				●					●	●	●
C. Community participation in decision-making process and project delivery						●						
D. Construction supervision and budget monitoring	●	●	●	●	●	●	●		●	●	●	●

● Complies

○ In process or complies with some parts of the component, but not all

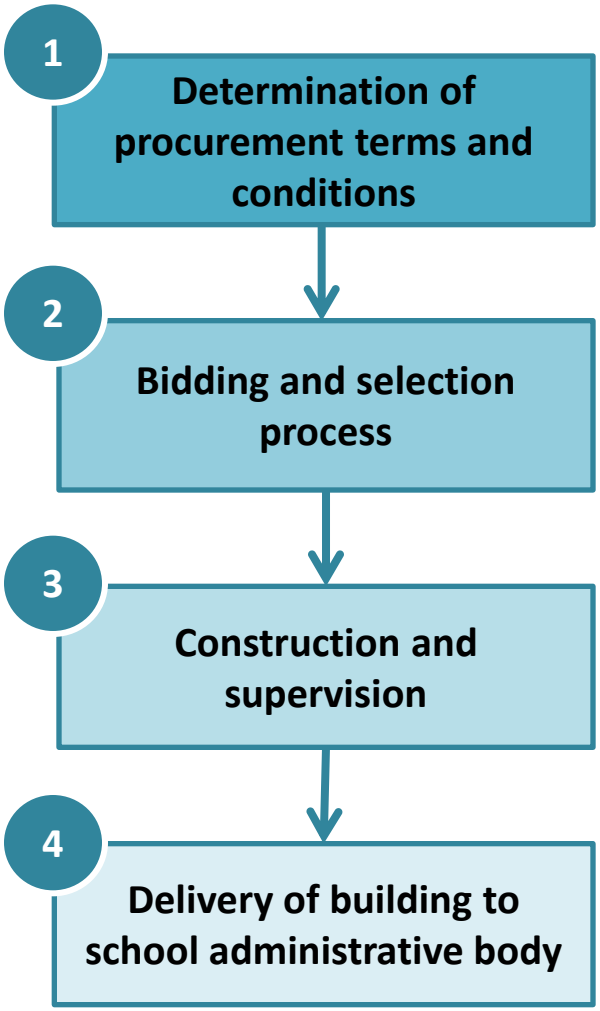
Does not comply or data is not available

It is not considered

Note: In Mexico, management and supervision of the construction are performed at the state level (not at the national). Therefore it is not considered in this chart.

CONSTRUCTION process for new infrastructure: Management process

The execution of new infrastructure can be outlined in these four basic phases:



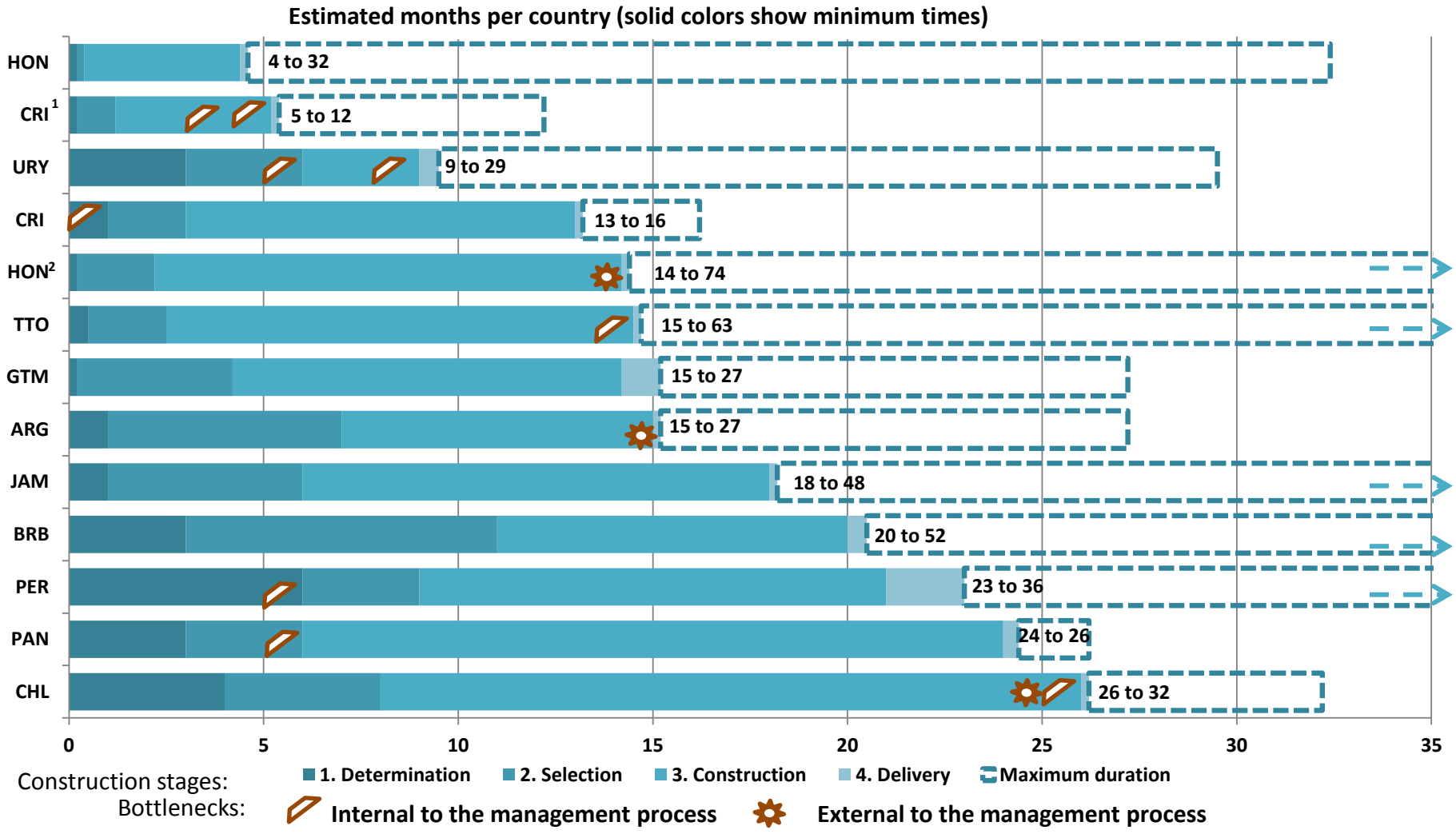
Technical specifications (timing, resources, planning, etc.) to determine the project's construction are defined.

Calls for tender are launched. Contractors and suppliers are selected and hired.

Contractors or specialized teams carry out the work. At the same time, various stakeholders supervise the works´ progress.

After works are completed, the delivery process starts. Final payments to contractors are made.

CONSTRUCTION process for new infrastructure: Work schedules



[1] Costa Rica has an alternative process for projects that cost less than 1 million USD.
[2] Honduras has an alternative process that is managed and executed by the community.
Note: In Mexico, the construction process is managed at the state (regional) level. Therefore it is not considered in this graph.

CONSTRUCTION process for new infrastructure: Main bottlenecks

Almost all countries experience frequent delays in works due to weather issues.

Contracting suppliers can often be a complex process with significant delays (5 countries). The lack of staff in decision-making positions prevents some countries from meeting all infrastructure needs (4 countries). Also, holidays and harvest periods were identified as frequent reasons for project delays (3 countries).

	Main bottlenecks	Affected countries	Good practices
Internal	**Long contracting processes** for suppliers/providers	5 countries Barbados, Costa Rica, Honduras, Panama, Uruguay	In Honduras, the Community Projects Program (PEC by its Spanish acronym) saves time in the contracting process because the community itself works as the provider.
Internal	**Lack of personnel** in charge of preparing projects	4 countries Barbados, Panama, Peru, Uruguay	
External	**Calendar events** (inactivity caused by holidays or harvest time)	3 countries Honduras, Chile, Argentina	

CONSTRUCTION process for new infrastructure: Stakeholders

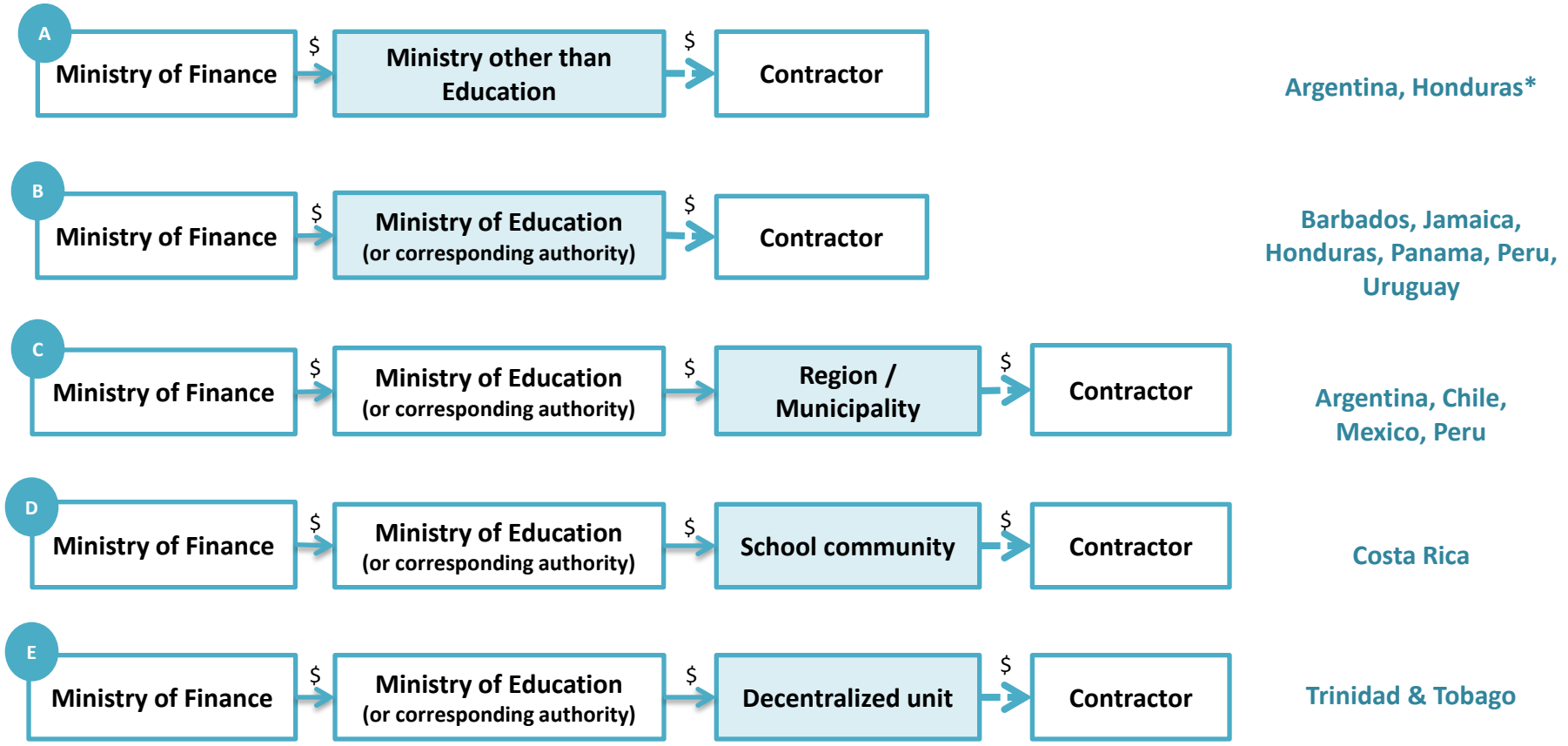
The 12 analyzed countries involve various stakeholders in their project execution processes, especially in the bidding and selection of contractors phase. There is not necessarily a clear relationship between the number of stakeholders and efficiency.

	Stakeholders	ARG	BRB	CHL	CRI	CRI[1]	GTM	HON	HON[2]	JAM	MEX	PAN	PER	TTO	URY
National	Audit Office/Supervisory Court											■			■
National	Ministry of Education (or corresponding education authority)		■	■	■	■		■	■	■		■	■	■	■
National	Ministries other than Education	■	■	■			■	■	■	■			■	■	
Regional	Regional government entities	■					■								
Regional	Regional offices of the Ministry of Education	■													
Local	Municipalities / Local governments			■					■						
Local	School management		■		■	■			■						
Other	School community									■				■	
Other	Autonomous Entity	■	■	■	■	■	■	■		■		■	■	■	■
Total TYPES of stakeholders		4	4	4	3	3	3	3	3	4		3	3	4	3
Estimated time (months)		15-27	21-52	26-32	12-16	6-18	15-27	5-33	14-74	19-48		24-26	23-37	14-63	10-30

[1] Costa Rica has an alternative process for projects that cost less than 1 million USD.
[2] Honduras has an alternative process that is managed and executed by the community.
Note: In Mexico, the construction process is managed at the state (regional) level. Therefore it is not considered in this chart.

CONSTRUCTION process for new infrastructure: Budget process

In the construction process, there are different models through which financial resources are allocated and delivered, depending on the **stakeholder receiving the resources and making payments to contractors** in charge of construction of new infrastructure, as well as the **timing for transferring resources** to that stakeholder (immediately after the project's approval or on proof of delivery).



* Honduras has an alternative process that is managed and executed by the community. The community is part of the decision-making process and is in charge of the workforce.

CONSTRUCTION process for new infrastructure: Common challenges

Some of the challenges reported during project execution include: slow budgetary processes (7 countries), long and complex procurement and bidding processes (6 countries), and lack of professional and technical teams at the local level (5 countries). The lack of resource supervision and monitoring were mentioned few times.

Barbados, Guatemala and Panama reported more challenges during the execution process than the rest of the countries. Argentina didn't identify any major challenge during any of the construction phases.

Perceived challenges	ARG	BRB	CHL	CRI	GTM	HON	JAM	MEX	PAN	PER	TTO	URY
Long and complex procurement and bidding processes		X		X	X	X			X			X
Slow budgetary processes		X			X	X	X		X		X	X
Lack of professional and technical teams at the local level to execute construction		X		X	X				X	X		
Lack of supervision during construction			X					X				
Lack of financial resource monitoring								X				

X Challenge \ Not a major challenge Not a challenge or data is not available

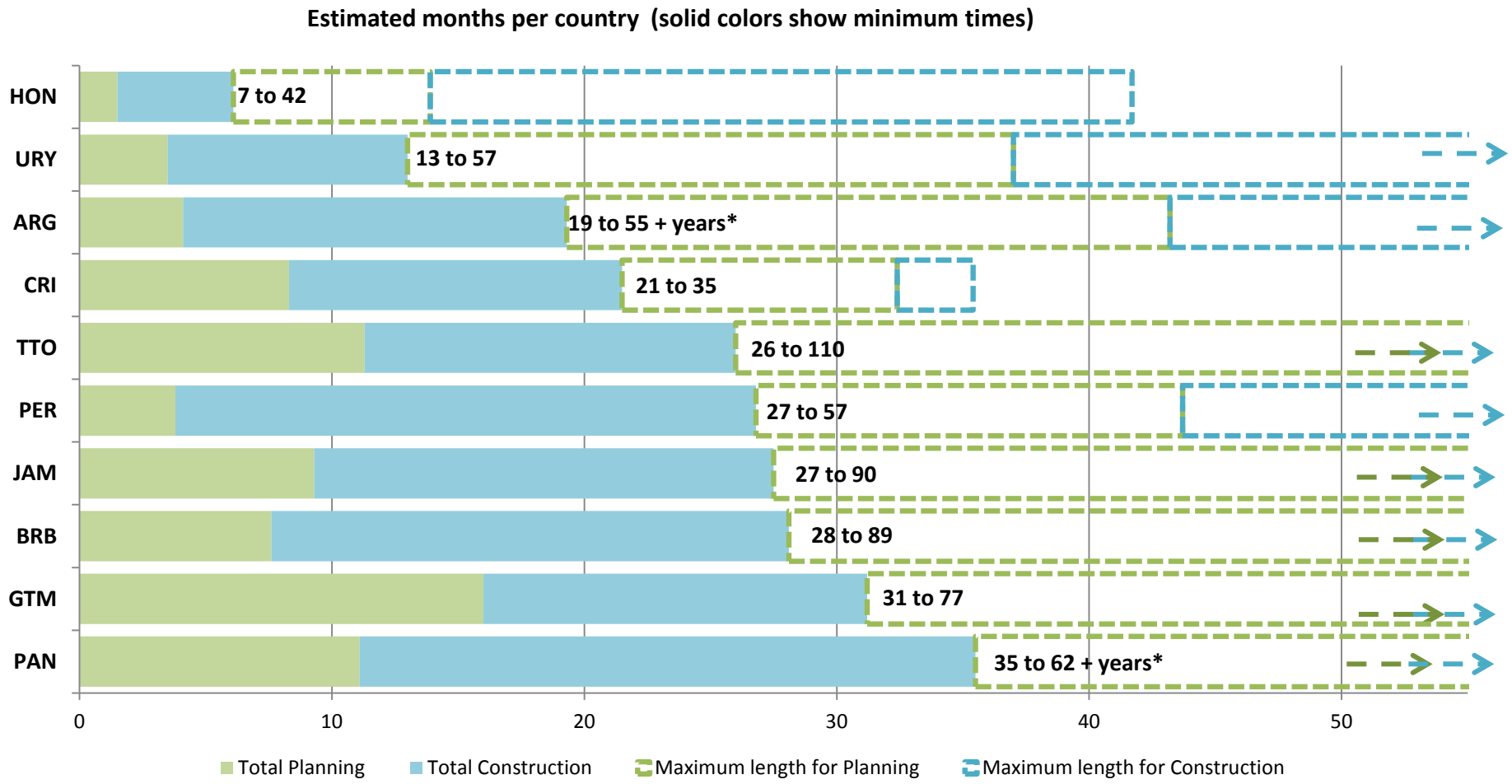
CONSTRUCTION process for new infrastructure: Good practices

These good practices are not exhaustive, but they serve to illustrate interesting and innovative processes and models.

Good practices

- **Consolidating contracts for new infrastructure in "packages"** that consider construction in more and less attractive places (e.g. rural areas) helps ensure the availability of construction providers in remote areas (Argentina, Chile).
- Having available a **Procurement Handbook** where clear and precise instructions for tendering processes are defined (Jamaica).
- **Assigning project management and construction directly to the school community** can have significant advantages, including: greater appropriation of the buildings by the community; capacity building (which favors better maintenance of infrastructure); lower costs; and creation of local employment. In order to assure quality, adequate technical supervision is fundamental. This modality is not recommended for complex construction structures (e.g. buildings of more than one story) (Honduras).
- Performing an **evaluation once the project is completed**. The report should include challenges as well as successes throughout the project. This can inform better capital planning processes in the future (Guatemala).
- Alternative financing mechanisms such as **Public-Private Partnerships (PPPs)** can enable greater efficiency (Peru), but costs and benefits should be carefully assessed.

PLANNING and CONSTRUCTION processes for new infrastructure: Work schedules



Note: In Mexico, the planning process is managed by each state(region) differently. Therefore it is not considered in this graph.

It was not possible to obtain the full data on Chile, therefore it is not included on this graph.

* Argentina and Panama mentioned that it takes years to get suitable land for school infrastructure, but did not specify the timeframe.

ROUTINE maintenance for existing school infrastructure

Based on the literature review and interviews, some key components for school infrastructure maintenance were identified to guide the analysis and comparison between countries.

ROUTINE Maintenance

A. Annual budget allocated to school administrations

B. Training programs to manage routine maintenance locally

C. Effective mechanisms for expense verification

ROUTINE Maintenance: Compliance with key components

Costa Rica, Guatemala and Peru stand out for complying with the three key components of routine maintenance. Argentina, Mexico and Trinidad & Tobago, on the other hand, present the most difficulties in this process.

Almost all countries, except Argentina and Mexico, have an annual budget allocated directly to school administrations for routine maintenance. However, this budget is not always allocated to all schools. For example, Honduras only allocates resources to 10% of schools that request it (and only monitors the use of resources in 5% of them that are selected randomly). In Trinidad & Tobago only secondary schools receive routine maintenance budget at the request of school principals, and there is not a clear system to allocate and supervise these resources.

Several countries have maintenance training programs for local teams. Very few countries say they have effective mechanisms for expense verification.

Key components	ARG	BRB	CHL	CRI	GTM	HON	JAM	MEX	PAN	PER	TTO	URY
A. Annual budget allocated to school administrations		○	●	●	●	○	○		●	●	○	●
B. Training programs to manage routine maintenance locally	○			●	●			○		●		●
C. Effective mechanisms for expense verification				●	●	●				○		

● Complies ○ In process or complies with some parts of the component, but not all Does not comply or data is not available

ROUTINE Maintenance: Key components (Budget and Training)

A. Annual budget allocated to school administrations

The budget allocated to routine maintenance is assigned in one of two ways:

Budget allocated for general maintenance (managed by the school administration)	Costa Rica, Guatemala, Honduras, Panama and Peru
Budget allocated for specific needs (managed centrally)	Argentina, Barbados, Chile, Mexico, Trinidad & Tobago, and Uruguay

Budget allocation ranges from $0.30 USD to $40 USD per student. Each country uses its own criteria for allocating amounts, including enrollment, school year, and school geographic location, among others.

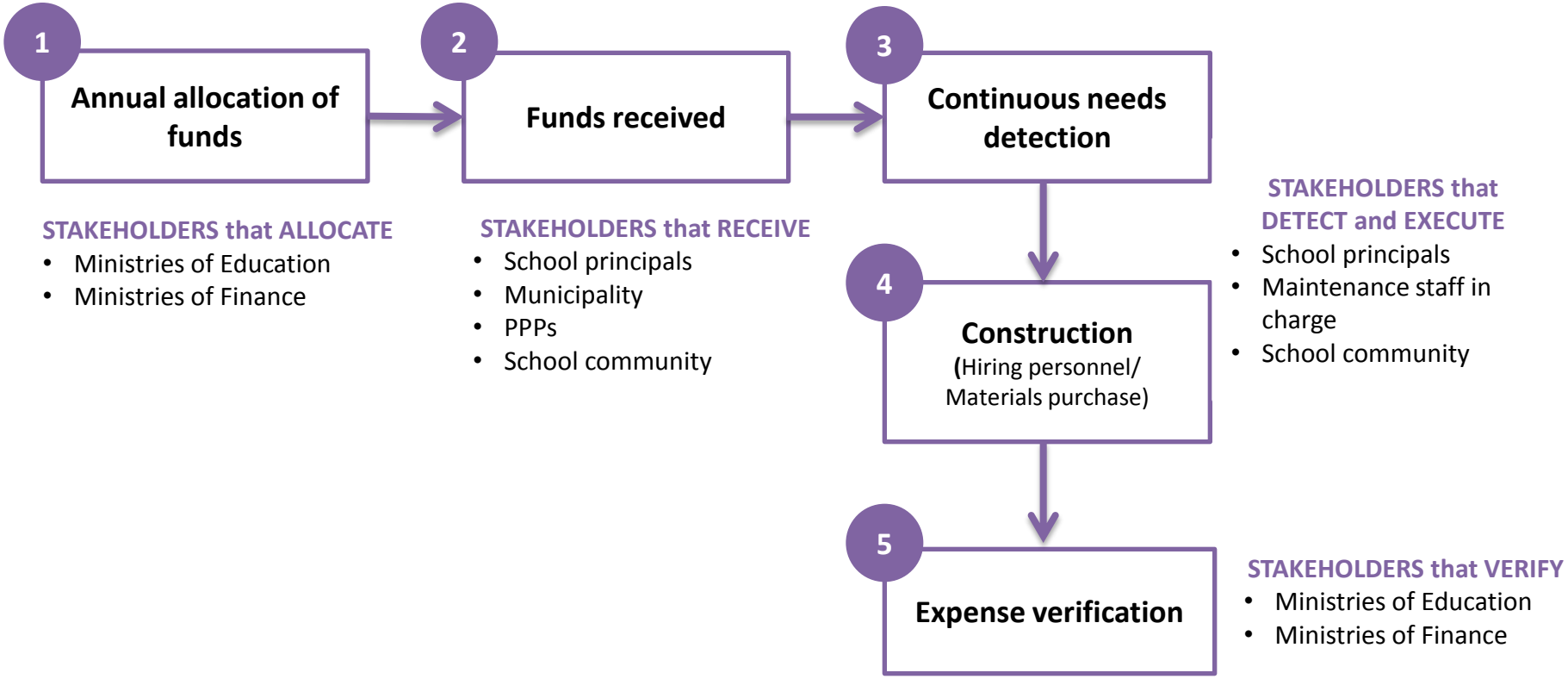
B. Training programs to manage routine maintenance locally

It is essential to build capacity in schools to identify maintenance needs and intervene at the appropriate time. The training resources in the analyzed countries include the following:

Maintenance manuals	Argentina (in process), Mexico (in process), Costa Rica, Guatemala, Peru
Training programs and / or workshops	Costa Rica, Guatemala
Provision of technical support at the local level	Uruguay

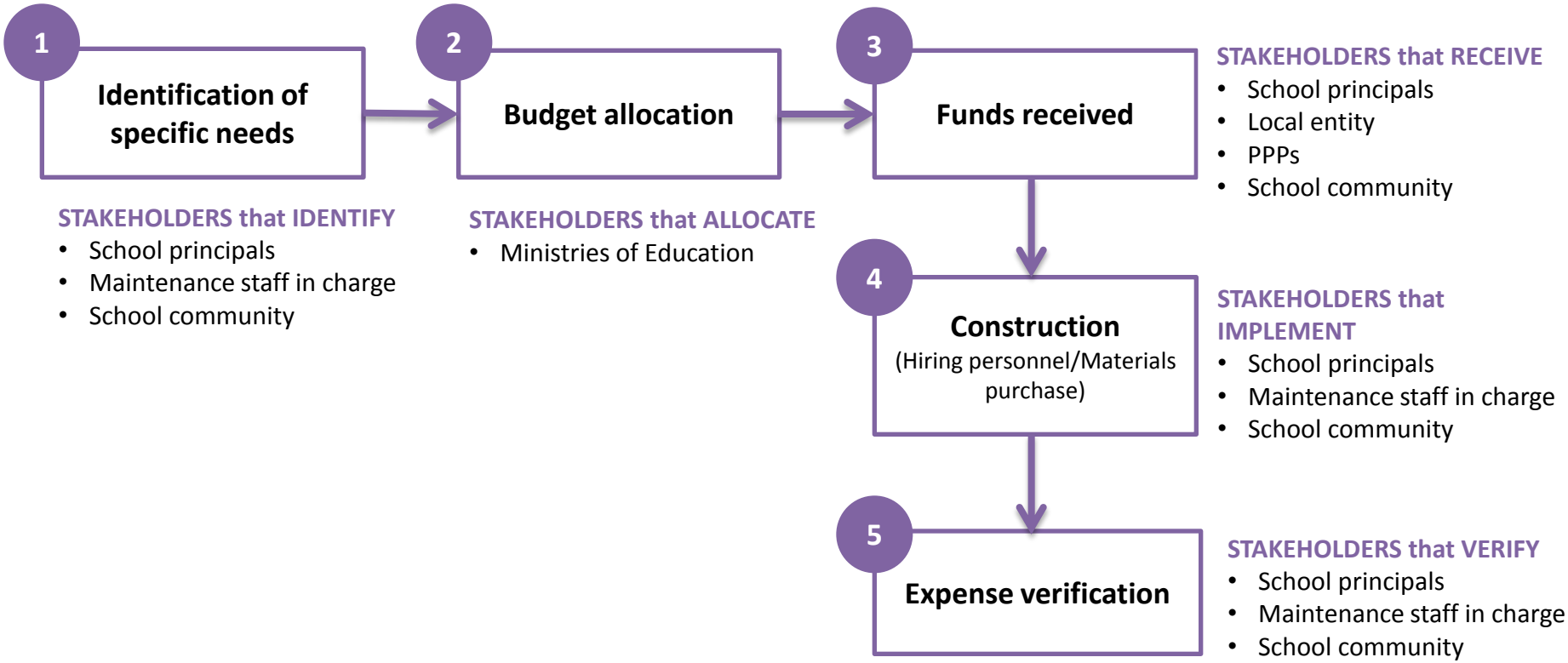
ROUTINE Maintenance: Processes and stakeholders involved in budget allocated for general routine maintenance

The countries with annual budget allocated for general routine maintenance are **Costa Rica, Guatemala, Panama and Peru**. These countries allocate an annual fund to each school (generally calculated based on the number of students) to meet their routine maintenance needs.



ROUTINE Maintenance: Processes and stakeholders involved in budget allocated for specific needs

The countries that allocate an annual budget to specific routine maintenance needs are **Barbados, Chile**, **Honduras**, **Jamaica, Trinidad & Tobago**, and **Uruguay**. Each follows different procedures. In Uruguay, for instance, budget allocation depends on identification and confirmation of needs reported via a specific toll free telephone number. In other cases, school principals request funds at the beginning of the fiscal year and budgets are allocated based on this request; expenses must be verified before the end of the year.



ROUTINE Maintenance: Common challenges

Frequent perceived challenges in routine maintenance include the lack of supervision during over the use of resources and construction works (7 countries), the lack of budget allocated to maintenance (7 countries) , and the lack of clear maintenance mechanisms (6 countries). It was also noted that in 5 countries, school maintenance is not seen as a priority and therefore does not receive adequate attention. Jamaica, Barbados and Chile lack of local technical staff to execute minor maintenance works.

Chile is the only country that faces all of these challenges, while Uruguay is the only nation not perceiving any challenges in their routine maintenance processes.

Perceived challenges	ARG	BRB	CHL	CRI	GTM	HON	JAM	MEX	PAN	PER	TTO	URY
Lack of clear mechanisms for maintenance	x		x			x		x	x		x	
Lack of budget allocated to maintenance	x	x	x		x	x		x			x	
Lack of local technical staff capacity		x	x				x					
Lack of supervision over the use of resources and construction works	x		x	x		x			x	\	x	
Routine maintenance is not seen as a priority	x	x	x			x		x				

x Challenge \ Not a major challenge Not a challenge or data is not available

ROUTINE Maintenance: Good practices

These good practices are not exhaustive, but they serve to illustrate interesting and innovative processes and models.

Good practices

- Provide **training for school principals** to identify and carry out preventive and corrective maintenance works when needed (Uruguay).
- Describe **routine maintenance works in a detailed guide** or manual (Guatemala).
- **Hire local architects** to supervise routine maintenance works (Uruguay).
- **Hire interns** (recent graduates or ongoing students) as technical support personnel to carry out minor maintenance repairs. This speeds up the response time of maintenance requests without significantly impacting costs (Uruguay).
- Keep track of and verify **routine maintenance in a digital system**, which allows better monitoring of results and resources (Peru).
- **Hire external private supervisors** to speed up the entire process (Panama).

Planning for RECONSTRUCTION/REHABILITATION of school infrastructure

Most countries manage major interventions of reconstruction/rehabilitation similarly to the one used for the construction of new infrastructure.

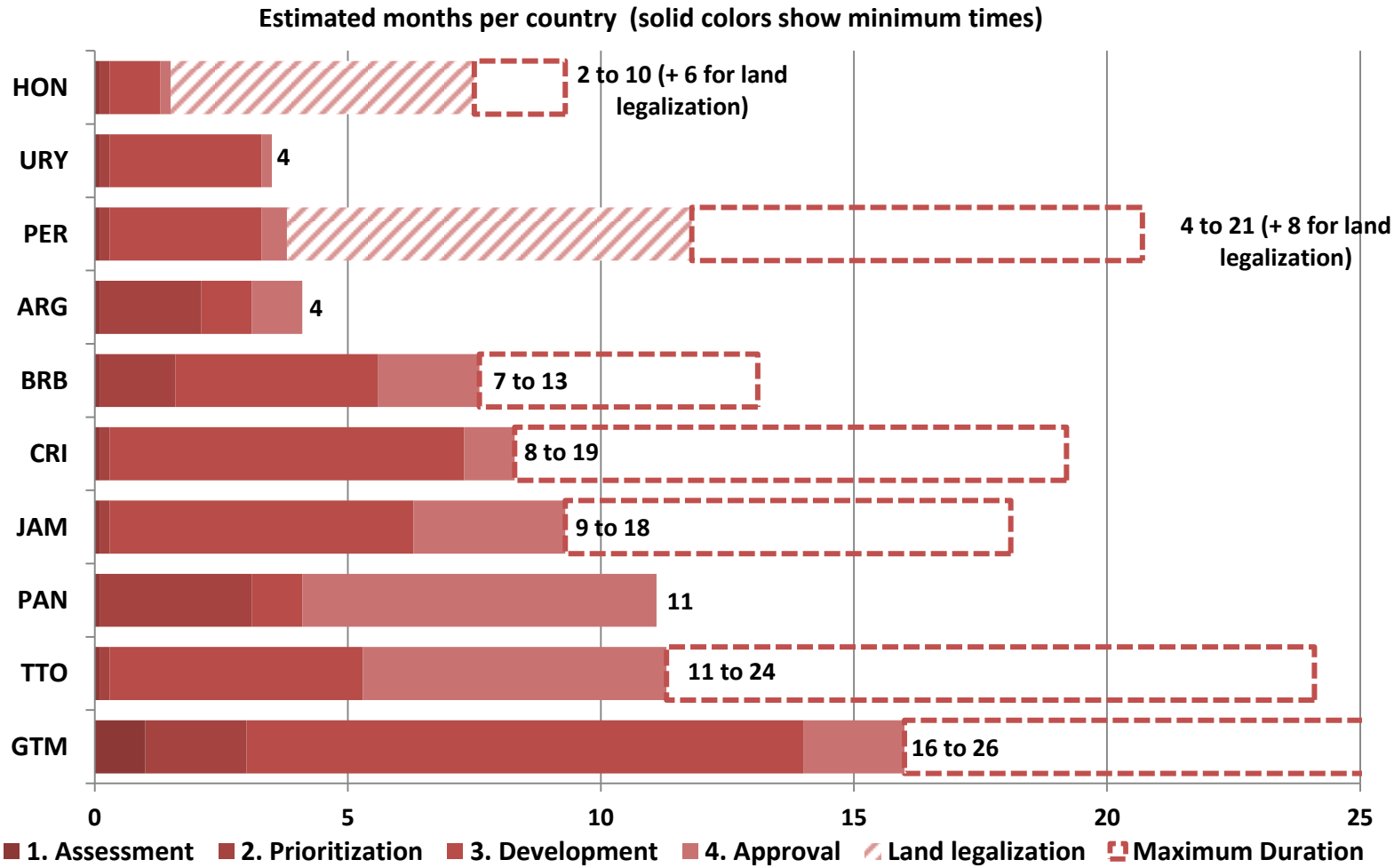
Needs assessment for maintenance can either be done through school requests or via systematized databases with updated information on the status of school infrastructure. Only Honduras, Mexico and Uruguay currently have automated systems and use them in their planning processes. Peru is now developing a similar system.

1 Needs assessment

1. Needs are identified through a **school infrastructure systematized database.**	Honduras, Mexico and **Uruguay**
2. Needs are identified through **requests from local stakeholders**.	Barbados, Chile, Costa Rica, Guatemala, Jamaica, Panama, Peru, Trinidad y Tobago, **Uruguay**

Note: Argentina has processes that depend on regional governments and vary significantly. Therefore, Argentina is not included in this analysis.

Planning for RECONSTRUCTION/REHABILITATION: Work schedules



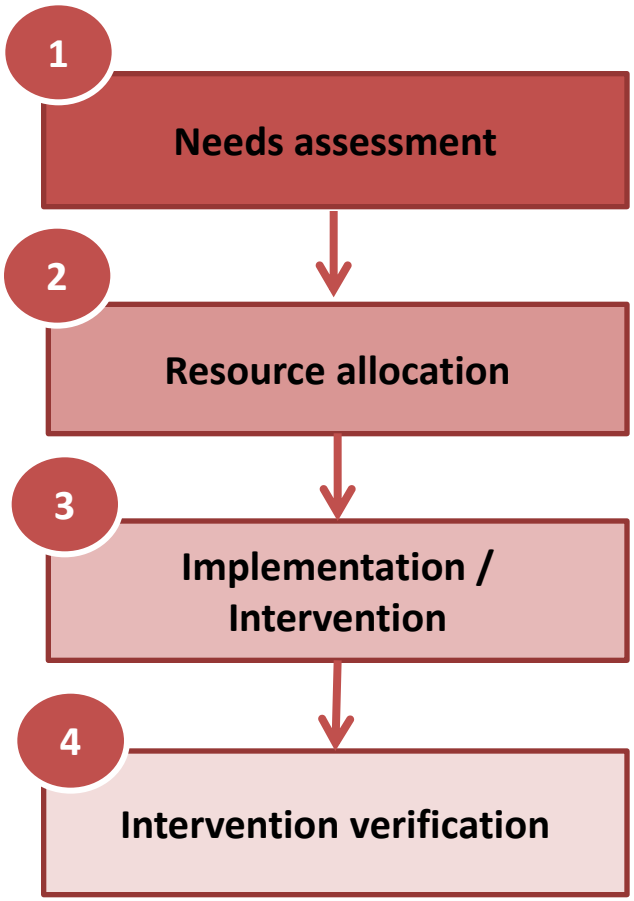
In Honduras and Peru, maintenance can be delayed significantly because of lack of legal land titles. By law, the land must be formally legalized before undertaking any infrastructure intervention.

Note: In Mexico, the planning process is managed by each state(region) differently. Therefore it is not considered in this graph.
It was not possible to obtain the full data on Chile, therefore it is not included in the graph.

EXTRAORDINARY Maintenance: Simplified management processes

Some countries (Barbados, Guatemala, Jamaica, Mexico, Panama, Peru, Trinidad & Tobago and Uruguay) have different systems to manage extraordinary maintenance works.

The process for extraordinary maintenance can be outlined in the these four basic phases:



Critical maintenance needs are identified.

The need for intervention is assessed and approved based on diverse criteria and methodologies. Then, resources for intervention are allocated.

Contractors are hired through simplified processes that do not require bidding. Interventions are monitored and supervised.

Once the work is done, it is inspected and verified, after which the final payment to the contractor is made.

EXTRAORDINARY Maintenance: Common challenges in the simplified management process

Delays in identifying critical maintenance needs pose a major challenge for Barbados, Jamaica, Mexico, Panama and Trinidad & Tobago. The lack of adequate funding was also perceived as an obstacle in Barbados, Guatemala and Trinidad & Tobago.

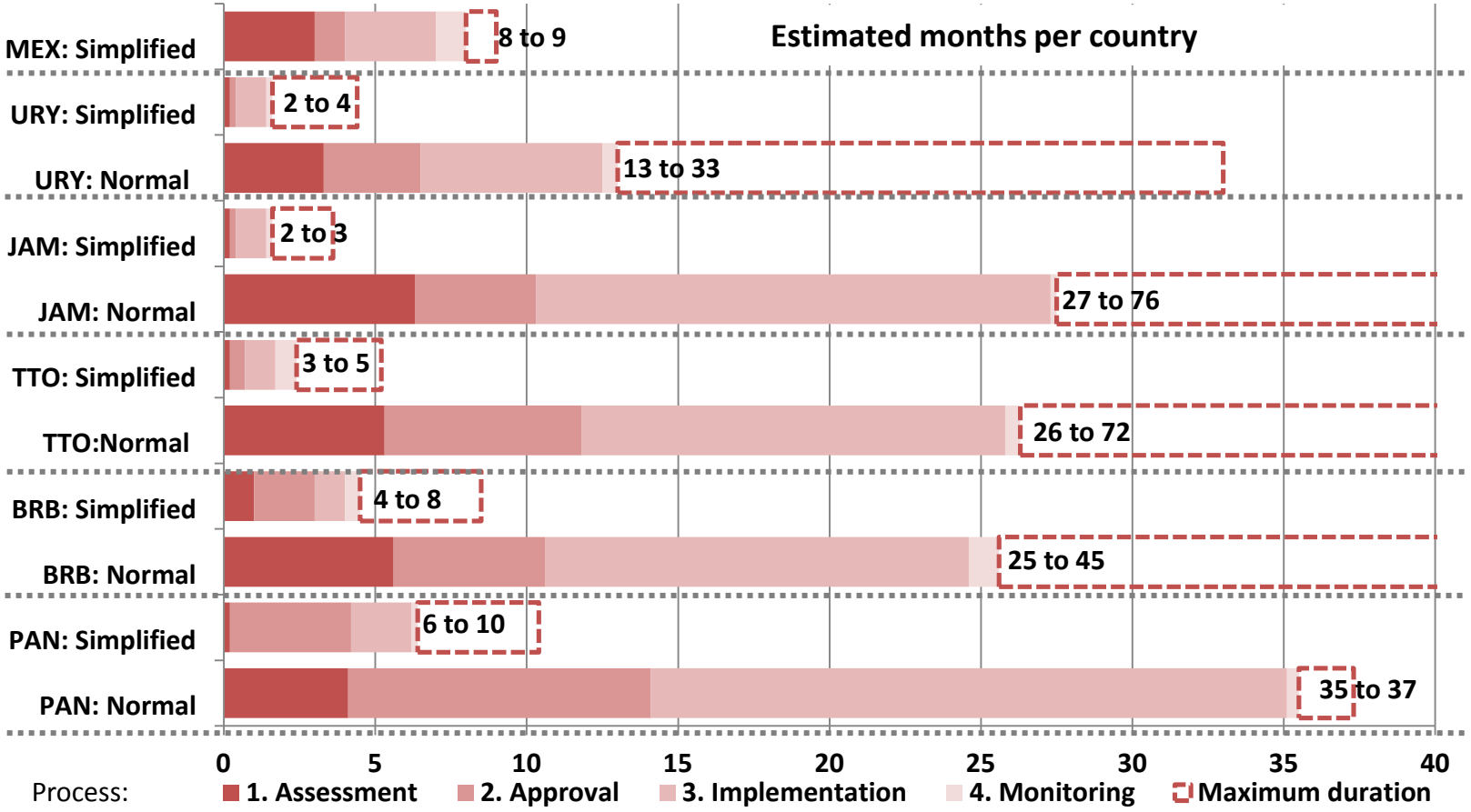
Trinidad & Tobago is the only country that reports facing these four main challenges. Despite this, implementation times for repairs are relatively fast in this country when compared to other cases.

Perceived challenges	ARG	BRB	CHL	CRI	GTM	HON	JAM	MEX	PAN	PER	TTO	URY
Delays in identifying needs		X					X	X	X		X	
Lack of adequate funding		X			X						X	
Delays in expense approval											X	
Lack of adequate supervision		X									X	

x Challenge | \ Not a major challenge | Not a challenge or data is not available | It is not considered

EXTRAORDINARY Maintenance: Work schedules between normal (new infrastructure) and simplified (maintenance) processes

Several countries use simplified processes to take on minor extraordinary maintenance works. Time saving following the simplified processes is significant.



Note: Only those processes managed by the national (central) level are taken into consideration.
Guatemala has a simplified process but it was not possible to get detailed information, therefore is not considered in this graph.

EXTRAORDINARY Maintenance: Good practices

These good practices are not exhaustive, but they serve to illustrate interesting and innovative processes and models.

Good practices

- Use **simplified processes** to manage minor but critical maintenance needs (Mexico, Costa Rica, Guatemala, Peru, Trinidad & Tobago, Uruguay).
- Have a **prioritization system** that clearly identify critical maintenance needs (Costa Rica, Mexico, Peru, Guatemala).
- Use an **automated system** (e.g. digital or toll free number) to identify and process maintenance requests to intervene promptly (Uruguay).
- **Hire interns** (recent graduates or ongoing students) as technical support personnel to carry out minor but critical maintenance repairs. This speeds up the response time of maintenance requests without significantly impacting costs (Uruguay).

INNOVATIVE PRACTICES: School Networks (Honduras)

What is it?

A model for sharing high-quality infrastructure and academic resources between nearby schools, optimizing the use of these and offering better learning opportunities to a greater number of students. It was initially intended for rural schools, but it has also been adapted to urban areas.

How does it work?

The model integrates School Networks of 5 to 10 schools located no more than 3km from a "main school," typically the largest, which is equipped with key facilities, including science labs, sports fields, media labs, etc. These are available to other schools that belong to the network, each of them assigned to specific days and times. As part of the network's organization, transportation between the "main school" and the peripheral schools is ensured. The schools in the Network may also share other resources like specialized teachers (e.g. English teachers). On average, each Network serves between 200 and 250 students.

Currently in Honduras there are 776 School Networks made up of 5,659 schools (25% of the country's total). On average, every Network serves 200 to 250 students. The goal is to reach all schools and integrate them into 2,400 Networks for the entire education system.

Lessons learned

- Sharing certain facilities (as sports fields, labs, etc.) and resources enables more efficient usage and allows more students access to higher quality education.
- For the model to work, transportation needs to be provided for students within the Networks.

INNOVATIVE PRACTICES: 0800 (Uruguay)

What is it?

It is a telephone service through which school principals file requests for maintenance needs. The system is managed by a computer system that facilitates prioritization of needs.

How does it work?

By filing a request, the system automatically notifies the corresponding authorities (in the case of Uruguay, the corresponding education council, the zone supervisor and the Sectoral Office of Infrastructure). The 0800 system is integrated with the "Building Ranking system", which prioritizes interventions.

It is jointly managed by the Sectoral Office of Infrastructure and the I.T. team of the Sectoral Office of Planning and Budget.

Lessons learned

- In addition to a "census-type" diagnostic for school infrastructure needs, it is important to have an easily-accessible tool to continuously report and prioritize emerging needs. This facilitates prioritization of needs as well as prompt response to requests.

INNOVATIVE PRACTICES: Community Projects Program (Honduras)

What is it?

The Community Projects Program (PEC for its Spanish acronym) is a modality where the community takes on project management to plan and construct school infrastructure. This includes direct provision of labor. In 2015, 171 projects were developed through PEC in Honduras.

How does it work?

These projects are managed under a contract with the Municipality, which supervises and allocates resources for the duration of the project. These projects are funded by the State for up to 80%, and the community and the Municipality have to provide an additional 10% each. This 10% is often provided through in-kind contributions (e.g. workforce and / or management to formalize ownership of land). Construction is supervised by a civil engineer, and before the project starts, the community receives training on contracting suppliers, management and project delivery.

The PEC modality is used mainly in low complexity projects (e.g. one-story schools) in rural areas in Honduras. By law, at least 40% of the workforce involved has to be made up of women.

Generally, these projects take between one and six years to be finished, which is three to four times more than the time required for an "ordinary" process.

Lessons learned

The PEC program implies significant advantages:

- The community builds capacity in useful skills for school maintenance.
- The community develops a sense of ownership over the school facilities, which fosters school maintenance.
- There are significant budget and time savings (profits charged by contractors are significantly lower and bidding process is not required).
- Promotes local employment in rural areas.
- It is easier to get workforce in inaccessible areas.

However, there are important disadvantages, such as:

- Difficulties in ensuring structural quality and safeness on buildings (thus, this modality is not used for complex projects).
- Delays in construction, mainly due to the lack of workforce during the harvest season of coffee.

INNOVATIVE PRACTICES: Works for Taxes (Peru)

What is it?

Works for Taxes (OxI) is a mechanism intended to speed up the capital planning processes of public works and finance construction without paying interest. It allows for the construction of public works by private companies, who choose to pay up to 50% of their income tax towards building school infrastructure, rather than paying the tax in cash.

How does it work?

Regional and local governments and Peru's public universities that receive public money (coming from natural resources and mining royalties, customs and income shares) may benefit from this mechanism. They select and prioritize projects that can be constructed through OxI. Private stakeholders may offer to carry out these projects.

For a project to be worked under this mechanism, it must be classified as viable and active in the National Public Investment System, and must not have any other source of funding.

In 2014, regional governments in Peru assigned 4,000 capital projects under this mechanism.

Lessons learned

- The implementation of these projects tends to be faster than through the "traditional" process.
- This mechanism saves financing costs as tax payment is replaced for actual public works (works are financed immediately and their value is discounted from next year's tax payment).
- For private companies, the OxI have the benefit of generating high social returns and other positive implications for them (e.g. the possibility of finding high-quality human capital more easily).