PROPOSAL
PARTNERSHIP FOR MARKET READINESS
CONNECTING REGISTRIES AND AUTOMATING MRV FOR CARBON MARKETS:
SUPPORTING COUNTRIES WITH DEVELOPMENT OF INFRASTRUCTURE FOR IMPLEMENTATION OF CARBON PRICING INSTRUMENTS

SUMMARY

The PMR has supported implementing country partners in deepening their understanding of the market infrastructure requirements. Some countries have established the necessary infrastructure like MRV systems and national registries. However, to meet the requirements of the emerging carbon markets within the decentralized framework of the Paris Agreement, there is a need to support the implementation of the market infrastructure leveraging on the work done as a part of the PMR. This proposal suggests that the **market infrastructure** needs to be based on a **robust and automated monitoring, reporting and verification system** that relies on a **national registry system** that is configured as a part of **peer-to-peer connected meta-registry system** for tracking of mitigation outcome to ensure the avoidance of double counting. Building on the learning of the PMR since its launch in 2010, this proposal seeks to leverage on the learning to put in place the connected market infrastructure that will permit the prompt start of implementation of carbon pricing instruments.

CONTEXT

The Paris Agreement, adopted in December 2015, promotes a collective global action that puts the world on track to avoid dangerous climate change by limiting global warming to well below 2°C. First time, the agreement, brings individual country action plans called as NDC 'Nationally Determined Contributions (NDCs) to achieve the global goal set to reduce greenhouse gases (GHG) emissions. These NDCs and supportive actions to ratchet up the ambition of these will determine whether the world achieves the long-term goals of the Agreement and to reach global peaking of GHG emissions as soon as possible. To achieve the ambitious goals the Paris Agreement sets in place provisions for enhanced cooperation among nations on climate change mitigation, including through market-based approaches, such as carbon pricing[1]. Two-thirds of all submitted Nationally Determined Contributions (NDCs) under the Paris Agreement consider the use of carbon pricing to achieve their emission reduction targets. This means 100 countries are looking into carbon pricing to achieve their NDC through international trading of emissions, offsetting mechanisms, carbon taxes, and other approaches.

[1] These provisions are elaborated in the following articles of the Paris Agreement:

- **Article 6.2**: Establishes the potential of trading emission reduction credits across borders, between nations or jurisdictions. This can encourage the linking of carbon pricing approaches across countries and jurisdictions resulting in the reduction of emissions by a magnitude greater than what is possible solely domestically or nationally.
- **Article 6.4**: Creates a new international mitigation mechanism to help countries reduce emissions and promote sustainable development. The mitigation engendered under this mechanism can also be used by Parties other than the host Party to fulfil their NDC. In other words, this provision allows for offsetting through the trading of emission reduction credits.
- **Article 6.5:** Puts in place robust accounting measures to avoid double counting of emission reductions and increase transparency, thereby ensuring the integrity of the proposed market-based approaches.

As part of the Paris Agreement, all countries also agreed to an enhanced transparency framework (ETF) for action and support through Article 13 which considers building mutual trust and confidence and to promote effective implementation of the Paris Agreement and the NDCs. Implementation of carbon pricing instruments and meeting other requirements of the Paris Agreement – such as ETF – demands substantial and immediate progress in countries' domestic monitoring reporting and verification (MRV) and national registry systems. This entails moving from fragmented, inconsistent and outdated methodologies to integrated and robust systems.

MONITOING, REPORTING AND TRACKING REQUIREMENTS UNDER THE PARIS AGREEMENT

To participate in international carbon markets and get access to climate finance under ***Article 6*** of the Paris Agreement, countries are *expected* to

- ensure tracking of internationally transferred mitigation outcomes (ITMO);
- provide the required national inventory report in accordance with the modalities procedures and guidelines adopted by the CMA pursuant to Article 13; and
- ensure the tracking and identification of ITMOs through a **registry** for creation, transfer, acquisition, hold, cancellation and use of ITMOs.

Furthermore, under the ***Article 13*** requirements, countries are required to submit biennial transparency report which should have

- a national inventory report of anthropogenic emissions by sources and removals by sinks of GHGs;
- information necessary to track progress in implementing and achieving its NDC under Article 4 of the Paris Agreement; and
- information on financial, technology transfer and capacity-building support needed and received under Articles 9, 10 and 11 of the Paris Agreement.

In its biennial transparency report each country should provide information on indicators[2] that should:

- Promote transparency, accuracy, completeness, consistency and comparability;
- Ensure that double counting is avoided; and
- Ensure environmental integrity.

To meet these requirements, countries need to develop and implement MRV methodologies. They also need to update, implement, and integrate new data and information flows with pre- defined periodicity and develop a registry to meet requirements from the Paris Agreement to support implementation of various carbon pricing instruments. Further, to enhance transparency and environmental integrity, emission reductions or ITMOs should be properly tracked and monitored between national registries as well as domestic carbon pricing instruments being implemented or under preparation within country. This can be accomplished through connecting multiple country registries to a common infrastructure such as meta-registry.

SUPPORTING CARBON MARKET INFRASTRUCTURE IN DEVELOPING COUNTRIES

To meet the requirements of the emerging carbon markets within the decentralized framework of the Paris Agreement, there is a need to support the development of the market infrastructure building on the work done as a part of the PMR. This proposal suggests that the **market infrastructure** needs to be based on a **robust monitoring, reporting and verification system** that relies on a **national registry**

[2] These indicators could include, as appropriate, for example: net GHG emissions and removals, percentage reduction of GHG intensity, relevant qualitative indicators for a specific policy or measure, mitigation co-benefits etc.

system that is configured as a **peer-to-peer connected meta-registry system** for tracking of mitigation outcome to ensure the avoidance of double counting. The project will be implemented in two phases –

Phase 1: Productization of MRV and registry systems
Phase 2: Deployment of systems in identified countries

These are described in more detail below.

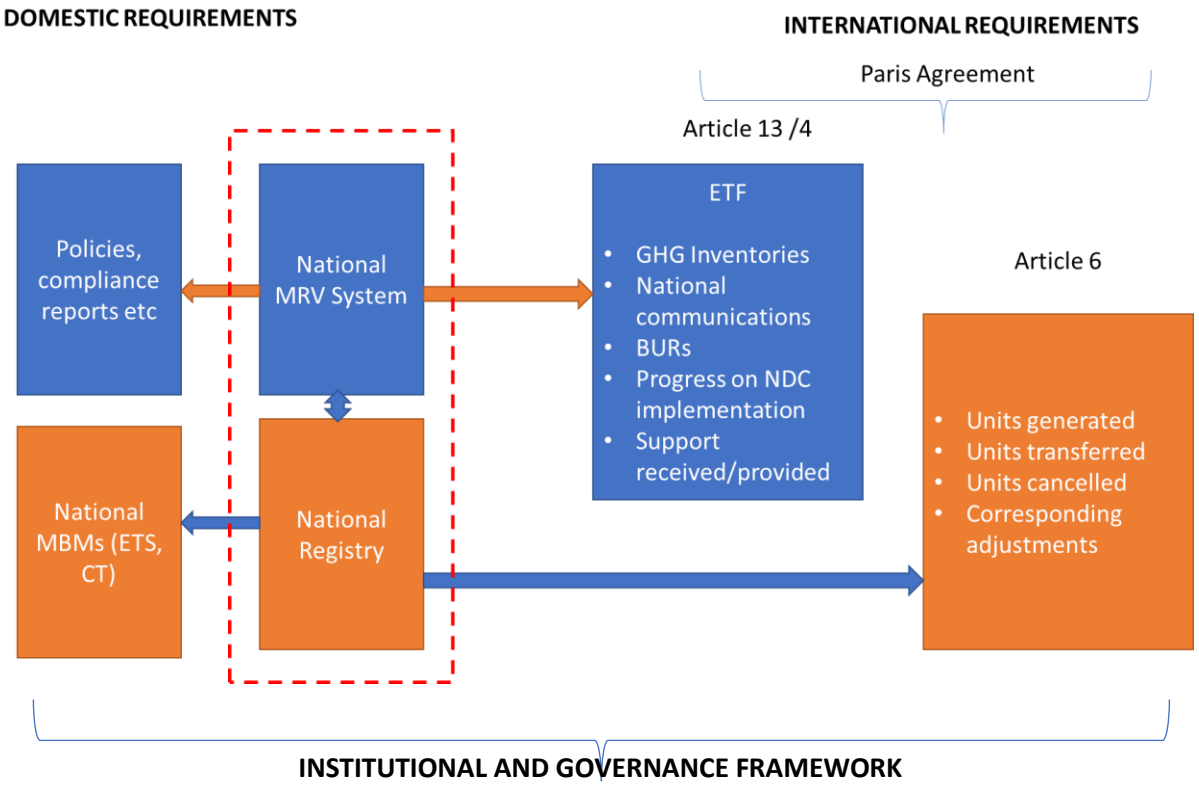
PHASE I: PRODUCTIZATION OF MRV AND REGISTRY SYSTEMS

Component 1: MRV Systems. To build mutual trust and confidence and to promote effective implementation of countries climate change mitigation policies, developing robust monitoring reporting and verification (MRV) system has been one of the core building blocks of the PMR support to countries. The MRV systems have become even more critical in the context of the Paris Agreement; effective implementation of countries NDC, carbon pricing instruments and, an enhanced transparency framework under the Paris Agreement depends on a reliable and robust MRV system. MRV also enables countries to meet international reporting requirements such as National Communications, Biennial Update Reports, and National Greenhouse Gas Inventories.

Countries with capacity, knowledge and know-how are designing MRV systems at different scales and scopes and are often implementing systems that have different coverage – the national level, sector-wide, and at the project/firm level. Implementing systems with multiple scales can add to the complexity of design and implementation, particularly in countries with limited capacities.

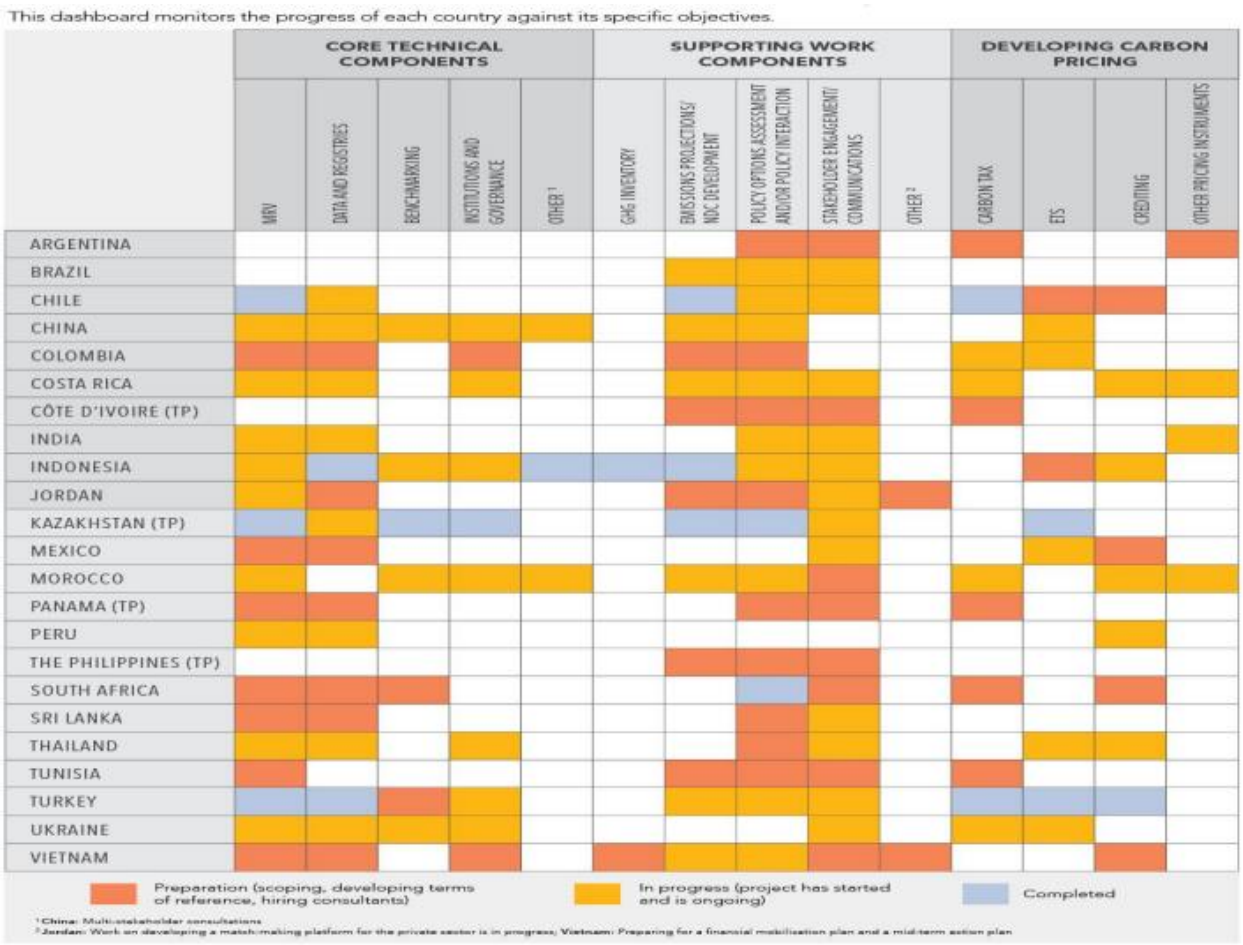
Integrating systems is the best long-term solution, but due to the differences in the types and granularity of data being collected, integration is often difficult to implement. An integrated approach can provide countries with a richer data set, lead to better, more country-specific emissions calculations, and provide an important means to undertake quality assurance/ quality control procedures. Standardization and automation of the data collection system and process using the fast development in sensor technology and remote communication can further improve the reliability of the MRV system, often at a lower cost.

PMR has offered support for design and implementation of MRV systems in various countries to meet specific objectives and to support implementation of carbon pricing instruments. These systems for example standardize the data collection and reporting software which is initiated as a database of ex-ante project related information. The system allows performance parameters of the project to be gathered through remote sensors and meters and permits the automation of process of third-party verification, creating a seamless, automated work-flow environment. With design and implementation experience in several countries, functional and technical specifications for designing these systems can be standardized with a flexibility to customize according the national needs, program requirements and NDC specificity. For example, the MRV system developed around the energy system in Jordan can serve a blue-print for implementation in many countries that need a similar system. “Productization” of such system and offering it countries in need reduces developmental costs significantly. **Productization of both MRV and country national registry system** together could help countries significantly in meeting various requirements for operationalization of the Paris Agreement and is depicted schematically in the figure below and will serve as a building block of the decentralized market infrastructure proposed in this note.

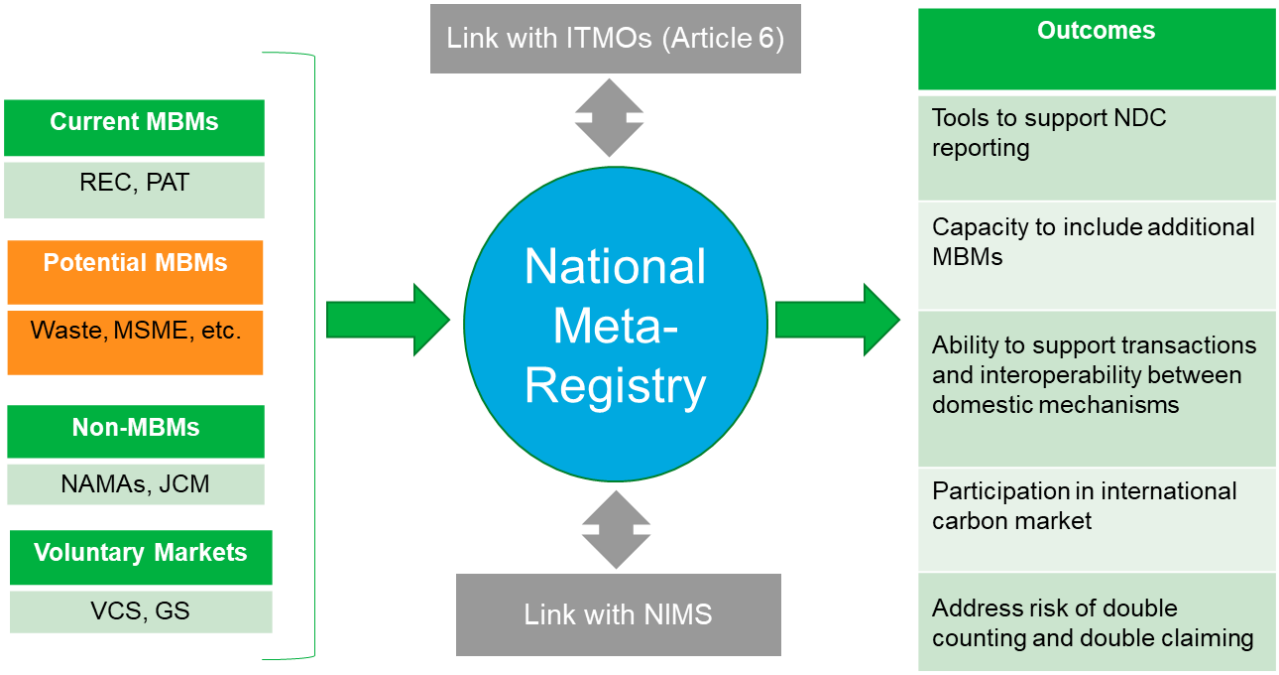


Component 2: The National Registry system. Given the heterogeneity of approaches recognized under the Paris Agreement, Article 6 of the Paris Agreement recognizes that Parties may engage in decentralized and bilateral cooperative approaches. Information about mitigation outcomes (MOs) or emission reductions is currently collected in a variety of repositories including spreadsheets, databases reflecting pipeline activities, and registries at the country, regional, or institutional level for issued MOs. The differences in these processes and systems constrain market integration and scalability and add to the complexity of conducting transactions.

The Kyoto Protocol and the modalities and procedures developed subsequently provided comprehensive rules and regulations for the issuance, transfer, e for compliance or cancelling of international units through national and CDM Registry systems. The PMR has supported several countries in understanding the needs of registry systems linked to the proposed market instruments. Countries like Indonesia and Turkey have completed their registries while number of other countries are in the process of designing and implementing their registry system (see figure below).



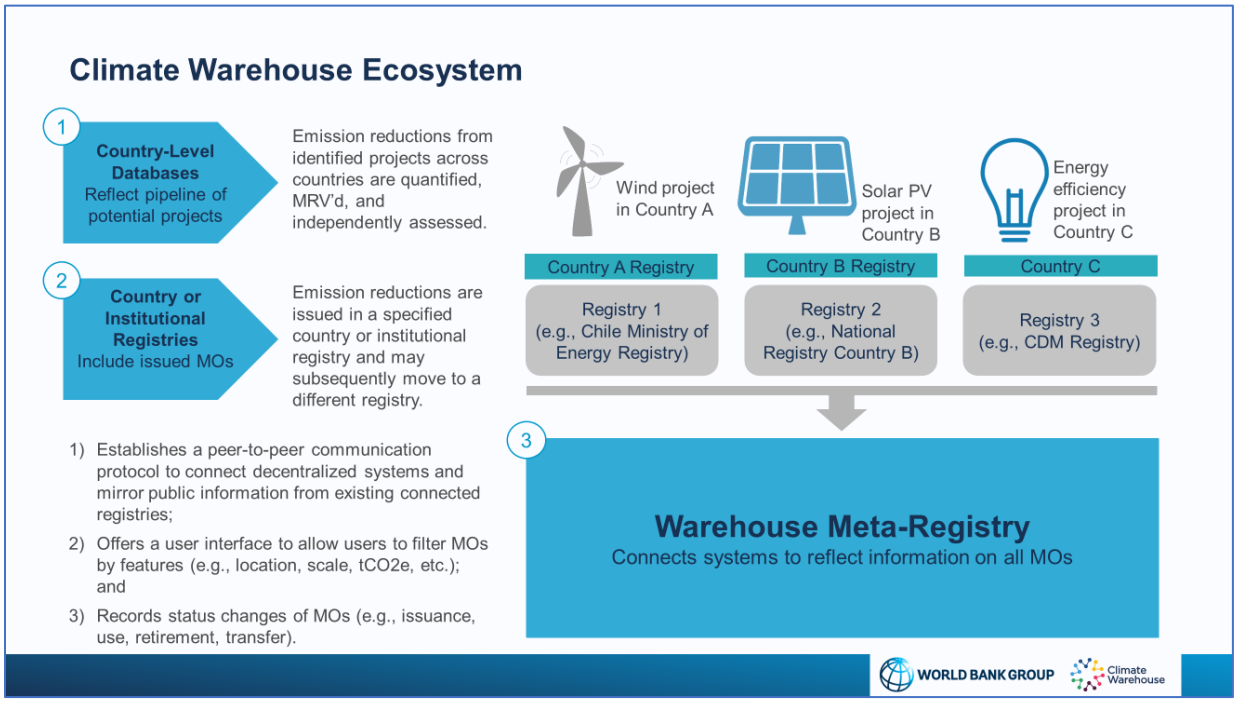
These has been a significant progress and evolution of understanding on the design of appropriate registries since the launch of the PMR in 2010. For instance, India and Sri Lanka have recently completed comprehensive needs assessment based on the possibility of multiple markets instruments being used to meet the NDC requirements. The conceptual design of a national "meta-registry" system that support renewables based green certificate system along with energy efficiency white certificate program (see figure below).



Market intelligence suggests that developing countries currently have widely varying databases or "registries" for collecting and reflecting pipeline activities to ex-poste, verified emission reductions in registries at the country, regional, or institutional level. These differences constrain market integration and scalability and will add to complexity of transactions and tracking to ensure market integrity. This component of the proposal will develop standard registry specification and implement these in selected countries to define minimum standard of market ready national registry systems that would make robust tracking of MOs and the avoidance of double counting.

Component 3: Meta-Registry System for Tracking Mitigation Outcomes. In the Kyoto Protocol, Annex I countries established national registry systems that are linked through an International Transaction Log (ITL) while developing countries relied on the CDM Registry for holding accounts for issued CERs. In contrast, the Paris Agreement includes neither provisions for issuing international units nor centralized oversight on transfers of ITMOs. Article 6.2 simply requires countries to "ensure environmental integrity and transparency", to apply "robust accounting", and to "authorize" transfers (Articles 6.2 and 6.3). Thus, more decentralized and more heterogeneous systems for tracking ITMO transfers may be expected. This poses a key challenge: in decentralized systems, the information reported by countries could be inconsistent – the transferring country may provide different information on a specific transfer than the acquiring country, e.g. because the two countries use different approaches and rules to account for international transfers. Hence, countries need to ensure consistency in information on international transfers of ITMOs under decentralized governance along with comprehensiveness of the information provided. While supporting countries establishing a standardized registry design is essential, it would be equally important to demonstrate the viability of connected, peer-to-peer national registry systems that is able to track MOs for avoidance of double counting. This may require inter alia establishing common technological interfaces, datasets and parameters to be captured and exchanged.

Supportd by Netherlands, Spain and Switzerland, the World Bank's has proposed meta-registry system



would connect to national registries to surface publicly-available information on MOs and record status changes to provide information on how MOs are used. Creating a robust tracking framework would enhance transparency and trust among market participants and enable tracking of MOs across jurisdictions. After establishing the viability and appropriateness of using blockchain technology as the basis for a meta-registry through a protype in June 2019, the Bank has initiated a simulation of the blockchain based meta-registry concept. This will involve partner institutions or countries that are implementing databases or registry solutions. With the support of the World Bank, partners will connect to the blockchain-based meta-registry to surface publicly-available information from their systems. Through learning-by-doing, the simulation will inform the partners about the process of connecting to a blockchain-based meta-registry and the potential for the use of this infrastructure. The simulation phase currently underway will be used to pilot the connection of the national registries set-up as a part of this proposal to the World Bank's Warehouse meta-registry system.

PHASE II: DEPLOYMENT OF SYSTEMS IN IDENTIFIED COUNTRIES

Once the systems are developed, next phase involves identification of countries and finalization of customization requirements to suit to the country context and its requirements. The country identification process will happen in parallel to the Phase I development. Along with deployment of the system, countries also need support with implementation of an institutional and governance framework and capacity building in order to operate the systems successfully.

Component 4: An Institutional and Governance Framework. In addition to these, based on the ongoing work in Article 6 and standardized crediting framework on designing the implementation arrangements for operationalization of Article 6, also the lessons learned from implementation of carbon pricing instruments in PMR countries, **an institutional and governance framework** can be developed and offered to countries in need. This framework takes existing country level institutional and organizational

structures and capacities of actors involved in to account, identifies the areas for strengthening, lays down the coordination needs between different actors and efforts needed to align different actions at domestic level and propose a framework to implement the structure needed.

Component 5. Institutional Strengthening and Capacity Building and Training. In many countries, the entities involved in the MRV system for the mitigation action have limited capacity and lack resources to comply with the requirements defined by the MRV system. Therefore, the institutions involved need to be strengthened and supported with capacity building activities. The capacity building and training activities developed under the PMR on MRV and registry systems can be offered to countries through different means (online course, face-face training, in-country workshops etc.).

RESOURCES NEEDED

Based on above, resources are needed for the following tasks:

- Productization of the MRV system
- Productization of the National Registry system
- Connecting between WB's Warehouse Meta-Registry and national registries
- Institutional strengthening and capacity building

Sl.	Activity	Amount (USD)
	PHASE I	
1	Productization of the MRV system - Productizing the MRV system based on the Jordan prototype - Multi-language support - Development of user manual and training material	250,000
2	Productization of the National Registry system - Development of functional and technical specifications - Development of the system that can be productized - Multi-language support - Development of user manual and training material	450,000
3	API development for connection between MRV/database systems and national registry	50,000
4	API development for connection between national registries and WB's Warehouse Registry or any other country registry	50,000
	Total (upfront cost)	**800,000**
	PHASE II	
	Per county Support	
1	In parallel to the Phase 1 development, the Secretariat will identify and shortlist the countries that requested or in need for these services and will customize the systems and deploy along with support them with institutional strengthening and capacity building.	Up to $250,000 per country

Note: the resources needed for per country support depends on how many countries wish to use the system and seek support from PMR. Given the nature of the work, it is expected that the support might be given to up to 10 countries during the next 9-12 months.

TIMELINE

November 2019 – December 2020

Activity/ Quarter	1	2	3	4
MRV system				
National Registry system				
Connecting to Warehouse Meta-Registry				
Country identification				
System deployment and institutional strengthening and capacity building				