

Solutions for three common challenges in national reporting in developing countries under the Paris Agreement

Temuulen Murun^{1*}, Chisa Umemiya¹, Takashi Morimoto², Tomohiko Hattori¹

¹Climate and Energy Area, IGES, ²Mitsubishi UFJ Research and Consulting Co., Ltd.

*Corresponding author: murun@iges.or.jp

Highlights

- Transitioning to the Enhanced Transparency Framework (ETF) under the Paris Agreement (PA), requires developing countries to enhance their national reporting systems to be more systematic and sustainable. We identified three common challenges that those countries often encounter when preparing their national reporting. These challenges are: 1) unclear roles and responsibilities among the related ministries; 2) a lack of human resources and experts; and; 3) difficulty in collecting data and information on mitigation actions (MAs).

- For each challenge, we developed a list of potential solutions in the short and long term based on a questionnaire survey. Following the survey, at the Asian Transparency Workshop, further feedback was received on which practical solutions participants would prefer in consideration of their respective circumstances. Based on their preferences, we identified recommended solutions as good practices in the short and long term such as developing a national legal framework, assigning a main coordinating institution, collaborating with domestic research institutions, establishing university curriculums on transparency, appointing a focal point on data provision and developing measurement, reporting and verification (MRV) guidelines for MAs.

-We then identified three factors underpinning countries' preferences for solutions: Efficiency, Accountability and Sustainability. Countries expressed a preference for solutions that can utilise existing infrastructure (efficiency), increase responsibilities of relevant stakeholders under transparency framework (accountability), and enhance long-term domestic capacity (sustainability). We consider these underlying factors to be important for selecting practical solutions to address those common challenges as well as building a sustainable reporting system. We also suggest that policymakers in developing countries should consider these three factors as guiding principles when strengthening their national reporting systems to successfully implement the ETF.

1. Introduction

Establishing a systematic and sustainable reporting system is key to implementing the enhanced transparency framework (ETF) under the Paris Agreement (PA). Developing countries, in particular, must urgently step up their actions and formulate plans to establish such a reporting system so that they can make the transition to the ETF (*Winkler et al., 2017*) before the new framework operationalises in 2024. Developing countries have responded to existing reporting requirements under the UNFCCC (prior to the ETF) to varying degrees (*Umemiya et al., 2017*). While those countries are required to submit Biennial Update Reports (BURs) every two years, 63 out of 154 (*UNFCCC, 2018b*) developing countries (non-Annex I parties under the UNFCCC) (less than half of the total) had submitted BURs as of 28 February 2021, and only four countries have submitted their fourth BURs since 2014 (*Hattori, T., Umemiya, C., 2021*). This indicates that countries preparing national reporting face a range of challenges under the existing reporting framework.

These challenges include, for example, that some developing countries have only a limited number of transparency experts that can apply international reporting guidelines. The others have also not yet assigned clear roles to each governmental or private stakeholder who engaged in transparency activities. Further, those countries often encounter difficulties in collecting and compiling data, including establishing a dataset (*UNFCCC, 2020b; UNFCCC, 2021*).

Sharing information on how to deal with these challenges would be one way for countries to enhance their respective reporting systems in a sustainable manner. Experience and knowledge from national reporting (e.g., BURs) serve as a solid starting point for developing countries to successfully transit to the ETF. Therefore, drawing lessons and sharing existing good practices to address common challenges in national reporting is essential to replicate proven practices in full consideration of each country's context. Currently, however, it seems countries do not widely share their practical experiences in overcoming these common challenges. In light of this situation, policymakers, government officials and experts with experience on national reporting from 12 countries in the Asia Pacific region got together at the Asian Transparency Workshop (ATW) (*IGES, 2020*) in December 2020 to discuss potential solutions to address the following common challenges, which are the focus of this paper:

- 1) Roles and responsibilities in relevant ministries
- 2) Human resources and experts in transparency-related work
- 3) Data and information collection on mitigation actions

Prior to the workshop, a questionnaire survey was conducted to develop a list of options as potential solutions. Participants at the ATW shared their views on preferable solutions based on the experiences and technical expertise in their respective countries.

The objective of this paper is to provide good practices as recommended solutions to address those three common challenges. In this way, countries aiming to build and strengthen their national reporting systems can learn from existing proven practices. In this paper, we also analyse the factors underpinning the preferences expressed by the participants in terms of solutions to address those challenges. We consider that these underlying factors can provide information on what kind of practices and solutions are more likely to be acceptable in developing countries for building a sustainable and systematic national reporting system. We believe these underlying factors are particularly useful for policymakers and government officials preparing for the transition to the ETF.

Section 2 provides a brief overview of the reporting requirements before and after the establishment of the ETF under the PA. Section 3 explains the three common challenges. Following Section 4 on Methodology, Section 5 details which options ATW participants preferred as solutions to overcome the challenges. In Section 6, we summarise the recommended solutions as good practices for other countries to consider, and discuss the underlying factors for each preferred solution.

2. Brief overview of reporting process

2.1 Existing reporting framework under the UNFCCC

Currently, under the UNFCCC, developing countries are required to submit national communications (NCs) every four years and BURs every two years as national reporting on their progress to address climate change. The key elements of NCs include relevant information on national circumstances, greenhouse gas (GHG) inventories, a vulnerability and adaptation assessment, a mitigation assessment, financial resources and transfer of technology, as well as information on education, training and public awareness (*UNFCCC, 2002*). BURs mainly contain the updates of the information reported in the latest NCs, including national GHG inventories, information on mitigation actions, and needs and support received on financial and technical capacity building (*UNFCCC, 2011*). The international consultation and analysis (ICA) process under the Subsidiary Body for Implementation (SBI) is being conducted to analyse BURs. The ICA consists of two steps — technical analysis of BUR by a team of experts (TTE), and facilitative sharing of views as a workshop under the SBI.

2.2 Enhanced Transparency Framework under the PA

The ETF of the PA builds on and enhances the existing reporting framework to ensure the transparency of climate actions and support. Under the ETF, all Parties are requested to submit a Biennial Transparency Report (BTR) every two years complying and following one common guideline, the modalities, procedures and guidelines for the transparency framework for action, and support referred to in Article 13 of the PA (hereafter MPGs) (*UNFCCC, 2018b*).

In the BTR, countries are required to submit GHG inventories complying with higher requirements such as on methodologies, gases and reporting year following the MPGs (Table 1). In addition, countries need to report information necessary to track the progress of Nationally Determined Contributions (NDCs), including information on indicators tracking the implementation and achievement of their NDCs, individual MAs, and projections of GHG emissions and removals (*UNFCCC, 2018b*). At the same time, the ETF offers flexibility for those developing countries that have limited capacity.

The first BTR should be submitted no later than 31 December 2024, which supersedes BUR submissions and the ICA process for developing countries. However, special consideration should be given to the least developed countries and small islands developing states. Under ETF, both developed and developing party countries will undergo a technical expert review and participate in facilitative multilateral consideration of progress (see Annex 1) (*UNFCCC, 2020a*).

Table 1. Enhanced reporting information on GHG inventories from BURs to BTRs

Main enhanced information	BURs <i>(UNFCCC, 2002)</i>	BTRs <i>(UNFCCC, 2018b)</i>
Methodologies	Should use the Revised 1996 IPCC Guidelines	Shall use 2006 IPCC Guidelines Encouraged to use the 2013 IPCC Wetland Supplements Shall report methods used in GHG inventory Shall provide information on category, gas, methodologies, emission factors accordance with IPCC guidelines
Key categories	Encouraged to undertake any key source analysis as indicated in the IPCC good practice	Shall describe key categories With flexibility , identify key categories using a threshold no lower than 85% in place of the 95% threshold defined in the IPCC guidelines
Gases	Shall provide CO ₂ , CH ₄ , N ₂ O by sources and removals by sinks Encouraged to provide HFCs, PFCs, SF ₆ .	Shall report CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , NF ₃ ; With flexibility , report CO ₂ , CH ₄ , N ₂ O and any of additional four gases (HFCs, PFCs, SF ₆ , NF ₃)
Time Series	Encouraged to provide a consistent time series back to the years reported in the previous NCs	Shall report a consistent annual time series starting from 1990 With flexibility , report data covering, at a minimum, the reference year/period for its NDC and a consistent annual time series from at least 2020 onwards.
Reporting years	Shall cover, at a minimum, the inventory for the calendar year no more than four years prior to the date of the submission	Shall be no more than 2 years (X-2) prior to the submission of its national inventory report With flexibility , have their latest reporting years as three years (X-3) (X: the year of submission of national inventory report)

3. Three common challenges

We identified three common challenges through our engagement with countries working on transparency-related activities including national reporting in the Asia Pacific region. Such activities include the Mutual Learning Program (MLP), conducted in 2020 by IGES together with our partner countries and organisations. During the series of meetings and exercises in the MLP, we conducted in-depth discussions on institutional arrangements, on the domestic MRV system on mitigation actions and on a GHG inventory to identify these challenges (*see also Murun et al., 2020; Murun et al 2021; Hattori et al., 2021*). In this section, we describe the three challenges mainly from the MLP discussion.

3.1 Challenge 1: Roles and responsibilities

The roles and responsibilities of key ministries and other stakeholders in institutional arrangements for transparency-associated work are unclear, resulting in an unwillingness to collaborate with national reporting work. The relevant ministries are reluctant to provide data and share information on mitigation policies, measures and actions in their own sector. Since the roles of relevant stakeholders have not been clearly defined and structured, governmental organisations are not mandated to engage with preparing national reporting (e.g., BURs and NCs) (*UNFCCC, 2020b*). Unstructured institutional coordination can slow down the systematic and efficient flow of information between ministries.

3.2 Challenge 2: Human resources and experts

A lack of human resources and experts in the transparency field makes it difficult to establish a sustainable reporting team. In this context, insufficient human resources refer to the fact that ministries lack staff who are able to work on collecting data, reporting, compiling, calculating, and reviewing it when preparing mitigation actions and GHG inventory reporting for BURs and NCs. This challenge can be associated with not having enough new professionals in this field. Without skilled and experienced staff on a national reporting team, it becomes impossible to process data and information, resulting in an inability to produce regular and timely technical outputs (*UNFCCC, 2020b*).

3.3 Challenge 3: Data and information collection

Collection of the data and information on MAs such as their progress and expected emission reductions is difficult in most developing countries for several reasons - key ministries do not have climate change-related divisions; there is no official guideline on how to collect data and information; nor is there a formal system to report and share this data with the relevant ministries (*Arfanuzzaman, Md., Shaheduzzaman, Md., 2021*). If robust data (e.g., GHG emission reductions) and information on MAs are not available, it is difficult to monitor and

track the result and effectiveness of mitigation policies and measures. A lack of proper guidance on MRV of mitigation actions and measures can reduce the quality, accuracy and reliability of data (UNFCCC, 2020b). When unnecessary and/or different formatted data are collected, it is less useful for national reporting (e.g., BURs and NCs). Without a systematic information collecting mechanism to support smooth data flow, necessary data for national reporting cannot be provided in a timely manner (UNFCCC, 2020b).

4. Methodology

4.1 Country survey

A questionnaire to identify possible long and short-term solutions to address common challenges was sent by e-mail to the expected participants of the ATW between November and December 2020. We set the short and long-term periods as up to 5 years and 10 years, respectively. The short-term period has a 5-year span which is roughly the time by when the 1st BTR will be submitted in 2024. The long-term period is for 10 years, which roughly coincides with the end of the NDC implementation period in 2030 for many countries.

The questionnaire (see Annex 2) sets out the three challenges and asked participants to share their national and expert experience as practical solutions to the issues. The respondents were mainly experts and government staff associated with climate policy planning, BURs and NCs related work including reporting mitigation actions and preparing GHG inventories in countries around the Asia Pacific region. Two organisations also responded, as they provide support for capacity building on transparency in developing countries, and carry out assistance on biennial report¹ (BR) preparation for a national government. In total, six government officials and experts from different countries (Indonesia, Mongolia, Myanmar, Thailand, Republic of Korea and Singapore) and two technical experts from the above-mentioned organisations responded to the survey.

We further analysed the survey results to develop the options for solutions to address the common challenges in the short and long term, respectively. Table 2 shows the list of options based on the results of the questionnaire.

4.2 Discussion at the ATW

Further feedback and comments on the options for solutions were received at the breakout group discussion at the two-day online ATW in December 2020. At the workshop, a total of 40 participants from 10 countries and eight international organisations provided feedback on each solution (Table 3) (IGES, 2020). During the breakout group discussion, participants expressed their views on preferred solutions and shared the reasons why they

¹ Biennial report is one part of national reporting submitted by Annex I (developed countries) Parties to the UNFCCC

selected those solutions.

Table 2. Short and long-term options for solutions to the three common challenges

Solutions to challenge 1. Roles and responsibilities	
Short-term options (~5 years)	
Option 1S-1	Establishing a project steering committee or working group involving key ministries
Option 1S-2	Assigning the main coordinating institution to direct roles and responsibilities for key ministries
Option 1S-3	Providing clear guidance on roles and responsibilities supported by high-level officials (e.g., Ministers)
Option 1S-4	Establishing data-sharing agreements and Memorandums of Understanding (MOUs) at the organisational level with key ministries and non-state stakeholders
Long-term options (~10 years)	
Option 1L-1	Establishing a national legal framework for government and non-state stakeholders (official documentation of institutional arrangements)
Option 1L-2	Embedding climate change work (including GHG emission reductions) into the agenda and strategic plan of key ministries
Solutions to challenge 2. Human resources and experts	
Short-term options (~5 years)	
Option 2S-1	Hiring national experts and consultants from the relevant ministries
Option 2S-2	Collaborating with domestic universities and research institutes (establishing a network of scientists)
Option 2S-3	Capacity building in a sustainable manner through training and workshops (domestic and international)
Option 2S-4	Providing incentives to attract technical experts by developing a clear career progression pathway
Long-term options (~10 years)	
Option 2L-1	Securing the state budget for key experts in the relevant ministries
Option 2L-2	Establishing university programmes (a graduate school) related to climate change and transparency to increase the number of young professionals
Option 2L-3	Aligning climate change policy to establish a task force for dedicating transparency related work in the relevant ministries
Solutions to challenge 3. Data and information collection	
Short-term options (~5 years)	
Option 3S-1	Establishing consistent methodologies for monitoring the progress of MAs
Option 3S-2	Appointing a focal point responsible for data provision in the relevant ministries
Option 3S-3	Common reporting templates in a tabular format on an agreed regular timeframe (e.g., Excel sheet)
Option 3S-4	Developing a clear and sound Standard Operational Procedure (SOP)
Long-term options (~10 years)	
Option 3L-1	Reorganising regulations related to climate change in individual legal systems
Option 3L-2	Developing legislation and detailed regulations including MRV guidelines for MAs
Option 3L-3	Creating a digital system to archive and track GHG emission reductions of MAs
Option 3L-4	Developing an information collection system (including evaluation and feedback mechanisms)

Table 3. Breakout group discussion and participants

Breakout groups	Common challenges	Participating countries and organisations
Group 1	Challenge 1. Roles and responsibilities	Countries: Indonesia, Japan, Malaysia, Mongolia, Myanmar, Philippines, Republic of Korea, Singapore, Switzerland and Thailand Organisations: UNFCCC Secretariat, UNFCCC Regional Collaboration Centre Bangkok, Technical Support Unit for IPCC–TFI, UNEP, UNEP-DTU, Global Support Programme, Organisation for Economic Co-operation and Development, International Energy Agency, Mitsubishi UFJ Research and Consulting Co., Ltd
Group 2	Challenge 2. Human resources and experts	
Group 3	Challenge 3. Data and information collection	

5. Results

Solutions for Challenge 1: Roles and responsibilities

Designating the main institution for coordination (option 1S-2) and *establishing data-sharing agreements and/or MOUs at the organisational level* (option 1S-4) were selected as the most preferable short-term solutions. Most participants expressed a preference for these solutions because option 1S-2 can build on existing institutional arrangements such as coordinating with the UNFCCC national focal point; and option 1S-4 would increase the responsibility held by the key ministries since agreements are most likely to be established at the ministerial level. The least preferred short-term solution was *providing guidance supported by high-level officials (e.g., Ministers)* (option 1S-3) as this would depend on personal relationships which could change for political reasons.

For long-term solutions, participants discussed ways to *develop a legal framework at the national level* (option 1L-1) including non-governmental stakeholders as the most preferred solution. Furthermore, countries stated that this should include drafting official legislative documents with clear definitions of the roles and assignments for the key ministries to increase their ownership of implementing activities. It was also acknowledged that developing and adopting such legislation may take some time.

Solutions for Challenge 2: Human resources and experts

For short-term solutions, most participants selected *collaboration with universities and institutions within a country* (option 2S-2) and *internal training programmes for enhancing own capacity* (option 2S-3). Option 2S-2 could cover skill shortages in the relevant ministries by helping to produce knowledge products based on their academic expertise. Option 2S-3 would improve in-house capacity using guidelines and handbook materials developed by IPCC and UNFCCC. The least preferred solution to address this challenge was *hiring national experts and consultants from other ministries* (option 2S-1). This was because staff in relevant ministries

and governmental agencies are often over-burdened by multiple tasks and have limited knowledge of transparency-related work including national reporting (e.g., BURs and NCs).

Developing university programmes related to transparency issues (option 2L-2) was recognised by participants as the most preferable solution in the long-term to overcome this challenge. This approach would increase the number of new professionals and experts with enough knowledge and expertise, and help to reduce knowledge loss in governments in the future.

Solutions for challenge 3: Data and information collection

Establishing consistent methodologies for tracking MAs (option 3S-1) and *appointing a focal point for data management in key ministries* (option 3S-2) were confirmed as preferable short-term solutions. The majority of experts agreed that these solutions can help in monitoring the effectiveness of implemented MAs and it can also enhance accountability of each stakeholder by clarifying data ownership. Moreover, in this way, transparency and accuracy of the collected data can be improved over time. Countries highlighted that the private sector could also be involved in data and information collection processes, by establishing clear connections with ministry focal points.

As a long-term solution, most of the participants selected *developing new legislation and regulations including MRV guidelines for MAs* (option 3L-2). This was supported because it would give legal obligation for collecting data and information by the related ministries and private sector.

See Annex 3, for further details of countries' feedback and comments for each option.

6. Discussion and conclusion

The recommended solutions are summarised in Table 4. These are practical experiences which countries have been implementing to overcome the common challenges. Therefore, we consider these solutions as proven good practices and recommend other countries to consider these solutions for addressing the three challenges in order to strengthen their national reporting system.

6.1 Underlying factors when considering solutions

Based on ex-post analysis of participants' feedback on their preferred solutions for the common challenges, we identified three factors², which were considered when participants expressed their preferences. The following are the underlying factors:

- **Efficiency:** Consideration on the potential to utilise existing tools or materials to minimise input resources such as labor and time, and accomplish goals.

² The factors are equal — one is not more significant and/or important than the others

- **Accountability:** Consideration on how to enhance ownership of tasks for both governmental and non-state (non-governmental) stakeholders.
- **Sustainability:** Consideration on whether the solution can maintain a country's performance and improve long-term ability.

First factor: Efficiency

Considering efficiency as one factor, participants recognised the importance of using already-established arrangements (e.g., *UNFCCC focal points*) and research institutions (e.g., *collaborating with domestic universities*) in a country, and utilising existing international guidelines (e.g., *developing domestic methodologies consistent with IPCC guidelines*). These options could save time and resources while achieving the set goal, in contrast to develop the required infrastructure for each solution from scratch. Moreover, participants preferred to make use of existing handbooks and training materials developed by international organisations (e.g., *UNFCCC and IPCC*) to build internal capacity and to improve monitoring MAs progress and implementation. One recommended way to successfully enhance a MRV system within a country is to make use of the IPCC guideline concept to standardise some methods for domestic purpose (*Climate Conference, 2015*). These efficient approaches would reduce the need to develop new training materials, and avoid additional work on MAs reporting in BURs to meet international reporting requirements.

Second factor: Accountability

Another factor that emerged from feedback on preferred solutions was how to enhance the accountability of stakeholders through mandatory and legal approaches (e.g., *establishing data sharing agreements/MOUs, developing a national legal framework*), as well as to clarify their work assignments (e.g., *appointing a focal point for data provision, developing MRV guidelines*). Participants highlighted options of increasing the accountability of the main ministries through legal approaches. This is key to enhance ministry participation in transparency-related work inducing national reporting, as collecting data and providing information would become legally binding, making the ministries accountable for achieving these activities (*Climate Conference, 2015*). In order to establish organised institutional arrangements, the national framework and official documents should define clear roles for each governmental organisation and clarify the scope of work in a structured manner (*UNFCCC, 2020b*). In terms of accountability, designating a focal point for data management would improve the timeliness of data provision and increase the accuracy of provided data because the assignment would become mandatory for government staff under the national law. This would help developing countries to establish a systematic reporting system. Moreover, to make sure that non-state stakeholders are more accountable for collecting and sharing data, their roles should be described in regulations including detailed MRV guidelines.

These guidelines on MAs would provide clear guidance on 1) what data should be monitored and collected; 2) how it should be reported and shared; and 3) how the data should be compiled and used for national reporting (e.g., BURs and NCs).

Third factor: Sustainability

Sustainability emerged as a third factor when participants expressed their preferred solutions. The experts highlighted options that can provide support for establishing a self-sufficient system in their countries (e.g., *in-house capacity building, establishing university programmes*) and for building a solid foundation for institutional arrangements in the long term (e.g., *developing a national legal framework*). Countries recognised the importance of building domestic capacity and increasing the number of professionals in the transparency field in order to create a sustainable reporting system, rather than hiring international consultants on a contract basis. A similar approach to enhance domestic technical capacity for MRV of mitigation actions was raised during a national workshop in Bangladesh (Arfanuzzaman, Md., Shaheduzzaman, Md., 2021). It is clearly more sustainable to create a nationwide overarching framework that will guarantee support for financial, human, and data resources (UNFCCC, 2020b), as these are core elements to building and maintaining well-functioning institutional arrangements in the long term. Securing a national budget for transparency-associated work can provide sufficient financial resources to employ regular full-time staff in the key ministries for maintaining a sustainable reporting team.

6.2. Conclusion

Learning from each other and replicating best practices is one way to overcome common challenges and build a strong reporting team in developing countries. This approach of learning from good practices is a solid starting point to strengthen a domestic reporting system in developing countries which is essential to successfully transition into the ETF. We consider that those three underlying factors (efficiency, accountability and sustainability) must be taken into consideration when implementing practical solutions in developing countries. Therefore, we recommend that policymakers and government officials who are working on transparency-related activities should consider these factors as key principles to establish a sustainable and systematic national reporting system. Table 4 sets out the relationship between recommended solutions for each common challenge and how each is linked with the three underlying factors.

Table 4. Recommended solutions and links with the factors

Recommended solutions for each challenge		E*	A**	S***
Challenge 1: Roles and Responsibilities				
Short term solutions	Assigning a main coordinating institution to direct roles and responsibilities for the key ministries	Yes		
	Establishing data sharing agreements and MOUs at the		Yes	

	organisational level with key ministries			
Long term solutions	Establishing a national legal framework (legislation of official documentation on institutional arrangements)		Yes	Yes
Challenge 2: Human resources and experts				
Short term solutions	Collaborating with domestic universities and research institutes (including establishing a network of scientists)	Yes		
	Domestic capacity building through trainings and workshops by utilising IPCC and UNFCCC handbooks	Yes		Yes
Long term solutions	Establishing university programmes related to climate change and transparency issues			Yes
Challenge 3: Data and information collection				
Short term solutions	Establishing consistent methodologies for monitoring the progress of MAs utilising IPCC guidelines	Yes		
	Appointing a focal point responsible for data provision in the relevant ministries		Yes	
Long term solutions	Developing legislations and detailed regulations including MRV guidelines for MAs		Yes	Yes

*E: Efficiency, **A: Accountability, ***S: Sustainability,

Among the recommended solutions, we would like to highlight the following ones for each challenge as we consider that these solutions could tackle the issues at their core:

Challenge 1 - Roles and responsibilities - Establishing a national legal framework with the legislation of institutional arrangements would build a stable foundation for future transparency-related work and is essential for countries to transition to the ETF under the PA. This solution would enhance the accountability of relevant participants and support the sustainability of a national reporting system.

Challenge 2 - Human resources and experts - We recommend building domestic technical capacity through training and seminars by utilising existing materials developed by international organisations such as UNFCCC and IPCC as the most effective solution in terms of both efficiency and sustainability. Improving knowledge capacity in a country would help countries to maintain a strong domestic reporting team which is able to process data and information for BURs/future BTRs as well as technical outputs for policy development.

Challenge 3 - Data and information collection - Developing legislation and detailed regulations including MRV guidelines on MAs would clarify which agencies and ministries are responsible for each assignment under MRV activities on legal documents. From the viewpoint of accountability, this approach could identify which government organisations are in charge of monitoring, reporting and verifying data that helps to establish a smooth flow of data and information between the key ministries.

While these highlighted solutions are significant enough to improve challenging situations for preparing national reporting in developing countries, it is important to consider integrating short and long-term solutions to address each challenge. In order to overcome

those common challenges and establish a sustainable domestic reporting system, countries need to combine these practical solutions to best fit with their national circumstances.

There are some limitations regarding data collection since we received only eight responses resulting in a small sample. Six of the experts that responded to the survey are from countries in the Asia Pacific region. This implies that identified options and recommended solutions may only be applicable in this region, but not for countries in other regions. Therefore, the options should be re-examined either at a workshop and/or by conducting an additional survey to consider applying these solutions and to recommend them as good practices in overall.

We suggest the following areas could be beneficial for future research to address similar challenges in national reporting and transparency work in general:

- Further study should be done to re-evaluate the options and recommended solutions to apply these to other regions such as Africa and Latin America, where the countries face similar challenges when preparing their BURs and NCs.
- The underlying factors (efficiency, accountability and sustainability) can be re-assessed and examined as to whether they are only relevant to the solutions of those three common challenges or whether they link with the overall transparency framework. Moreover, further research can be conducted to identify any additional factor that developing countries should consider when selecting solutions to any challenge that come up in enhancing the national reporting process.
- It is also important to evaluate the weight of each factor in order to determine how developing countries would prioritise solutions if all factors are relevant to different solutions. These could help policymakers and governments to understand which factors are significant for their national reporting system under the ETF when these are not equally linked with solutions.

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Annex 1

Table A1-1. Enhanced reporting information on GHG inventories from BURs to BTRs

Reporting	<p>All parties (shall): -Submit national GHG inventory report -Provide progress of NDCs implementation and achievement</p> <p>All parties (should, as appropriate): - Report climate change impacts and adaptation</p>	<p>Developed country Parties (shall) and other Parties that provided support (should): -Provide information on financial, technology transfer and capacity building support provided and mobilised to developing country Parties under Article 9,10 and 11</p>	<p>Developing country Parties (should): -Provide information on financial, technology transfer and capacity building support needed and received under Article 9, 10, and 11</p>
Technical expert review	<p>All Parties (shall): - Undergo a technical expert review of information submitted under Article 13.7</p>	<p>Developed country Parties (shall) and other Parties that provided support (may): - Undergo technical expert review of information submitted under Article 13.9</p>	
Facilitative multilateral consideration of progress	<p>All Parties (shall): -Participate in a facilitative multilateral consideration of progress with respect to efforts under Article 9 and its respective implementation and achievement of Parties' NDCs</p>		

Annex 2

**Pre-survey on
“Existing challenges and possible solutions related to tracking progress of
mitigation actions (MAs) in 1st BTR preparation”**

This pre-survey requests the participating countries to provide their own perspectives, experiences, and ideas on possible solutions for addressing the five [5] common existing challenges related to:

1. Allocation of roles and responsibilities
2. Human resources and capacities
3. Data collection
4. Data compilation and reporting
5. Data utilization

Please keep in mind that these five challenges are related to a general framework of tracking progress of MAs, not focusing on specific sector’s MAs. Please be informed that the information will be only used for the purpose of designing the workshop.

In below, we are seeking your perspectives, experiences, and ideas on possible solutions to address each of these challenges in the short (~5 years) and long terms (~10 years).

Common challenge #1: Roles and responsibilities between the relevant ministries and stakeholders in institutional arrangements for transparency-related activities are not defined clearly; therefore, ministries and stakeholders are not willing to engage.

Question 1-1: From your perspective, what could be possible solutions for a country to address this common challenge #1 in the short (~5 years) and long terms (~10 years)?

Possible solutions in the short term (~5 years)	Possible solutions in the long term (~10 years)
<p><i>Example answer: Establishing data sharing agreements and MOUs at the organizational level with key ministries</i></p> <p>[Your answer here]</p>	<p><i>Example answer: Establishing an overarching legal framework at the national level defines a clear mandate for relevant ministries involving in transparency related work.</i></p> <p>[Your answer here]</p>

Question 1-2: Is this challenge #1 currently relevant to your country? Please select one from below:

- Highly relevant
 Relevant
 Less relevant
 Not relevant

Common challenge #2: A lack of experts and/or human resources in this field leads to difficulty in establishing a sustainable reporting team.

Question 2-1: From your perspective, what could be possible solutions for a country to address this common challenge #2 in the short (~5 years) and long terms (~10 years)?

Possible solutions in the short term (~5 years)	Possible solutions in the long term (~10 years)
[Your answer here]	[Your answer here]

Question 2-2: Is this challenge #2 currently relevant to your country? Please select one from below:

- Highly relevant
 Relevant
 Less relevant
 Not relevant

Common challenge #3: Collection of the data and information of MAs is difficult because:

- No climate change-related divisions in relevant ministries and organizations to collect and monitor GHG emission reduction data,
- No clear guidance/information on which data to collect,
- No formal system to collect data and information of MAs,
- No formal system to report or share the collected data and information of MAs,

Question 3-1: From your perspective, what could be possible solutions for a country to address this common challenge #3 in the short (~5 years) and long terms (~10 years)?

Possible solutions in the short term (~5 years)	Possible solutions in the long term (~10 years)
[Your answer here]	[Your answer here]

Possible solutions in the short term (~5 years)	Possible solutions in the long term (~10 years)

Question 3-2: Is this challenge #3 currently relevant to your country? Please select one from below:

- Highly relevant
 Relevant
 Less relevant
 Not relevant

Common challenge #4: Compiling and reporting the data for the BTR in accordance with the Modalities, Procedures and Guidelines for the transparency framework for action and support (MPGs) of is difficult, in particular:

- Tracking progress of NDC implementation
- Estimating emission reductions achieved/expected outcomes of MAs
- Information on ITMOs (Internationally transferred mitigation outcomes)

Question 4-1: From your perspective, what could be possible solutions for a country to address this common challenge #4 in the short (~5 years) and long terms (~10 years)?

Possible solutions in the short term (~5 years)	Possible solutions in the long term (~10 years)
[Your answer here]	[Your answer here]

Question 4-2: Is this challenge #4 currently relevant to your country? Please select one from below:

- Highly relevant
 Relevant
 Less relevant
 Not relevant

Common challenge #5: The data and information of MAs have not been sufficiently utilized to evaluate mitigation actions' effectiveness, improve domestic climate policies, and to develop next NDCs.

Question 5-1: From your perspective, what could be possible solutions for a country to address this common challenge #5 in the short (~5 years) and long terms (~10 years)?

Possible solutions in the short term (~5 years)	Possible solutions in the long term (~10 years)
[Your answer here]	[Your answer here]

Possible solutions in the short term (~5 years)	Possible solutions in the long term (~10 years)

Question 5-2: Is this challenge #5 currently relevant to your country? Please select one from below:

- Highly relevant
- Relevant
- Less relevant
- Not relevant

Question 6: Please provide, if any, challenges that you see are not covered in the above listed five common challenges:

[Your answer here]

Annex 3

Table A3-1. Feedback on the solutions for Challenge 1. Roles and responsibilities (Breakout group 1 discussion at the ATW)

Options of possible solutions in short term (~5 years)			
Option 1S-1. Establishing a project steering committee or working groups involving key ministries	Option 1S-2. Assigning the main coordinating institution to direct roles and responsibilities for key ministries	Option 1S-3. Providing a clear guidance on roles and responsibilities supported by high-level people (e.g., Ministers)	Option 1S-4. Establishing data sharing agreements and MOUs at the organisational level with key ministries and non-states stakeholders
Feedback on each option			
- Involve many relevant stakeholders - May take some time	-Align with existing institutional arrangements is important and collaboration with the national focal point to the UNFCCC	-May depend on personal relationship -The high-level officials may change	- Increase responsibility of stakeholders, especially for data collection process - May take some time
Options of possible solutions in long term (~10 years)			
Option 1L-1. Establishing a national legal framework for government and non-government stakeholders (legislation and official documentation of the institutional arrangements)	Option 1L-2. Embedding climate change issues (GHG emission reduction) into key ministries' agenda and strategic plan		
Feedback on each option			
-Official and legal documents are important to set standards and institutional arrangements -Can provide stronger basis for long term institutional arrangements but may take time to establish		-When political situations change the main strategy and policy of ministries may change	

Table A3-2. Feedback on the solutions for challenge 2. Human resources and experts (Breakout group 2 discussion at the ATW)

Short term solutions (~5 years)			
Option 2S-1. Hiring national experts and consultants from the relevant ministries	Option 2S-2. Collaborating with domestic universities and research institute (including establishing a network of scientists)	Option 2S-3. Capacity building in a sustainable manner through trainings, workshops and seminars (domestically and internationally)	Option 2S-4. Providing incentives to attract technical experts by developing a clear career progression pathway
Feedback on each option			
-A lack of knowledge in the key ministries -Ministry staff are overloaded with multiple tasks	-Can provide sector-specific knowledge for the key ministries -Support to produce standard operating procedure and manuals based on institutional knowledge	-Help stakeholders in other ministries to build their capacities in a sustainable way -Utilise existing learning materials for capacity building (e.g. IPCC guidelines and UNFCCC handbooks)	-Help to attract more experts if incentives for work achievement could be provided
Long term solutions (~10 years)			
Option 2L-1. Securing the state budget for key experts in the relevant ministries	Option 2L-2. Establishing university programs (grad school) related to climate change and transparency to increase young professionals	Option 2L-3. Aligning climate change policy to establish a task force for dedicating transparency related work in the relevant ministries	
Feedback on each option			
	-Help to minimise knowledge loss in the long term due to staff turnover -Increase limited human resources and expertise in a country	- Help to set up a budget for MAs implementation -If an entity/task force is newly established it may face difficulties in securing a budget	

Table A3-3. Feedback on the solutions for challenge 3. Data and information collection (Breakout group 3 discussion at the ATW)

Short term solutions (~5 years)			
<p>Option 3S-1. Establishing consistent methodologies for monitoring the progress of MAs</p>	<p>Option 3S-2. Appointing a focal point responsible for data provision in the relevant ministries</p>	<p>Option 3S-3. Common reporting templates in a tabular format on an agreed regular time frame (e.g. excel sheet)</p>	<p>Option 3S-4. Developing a clear and sound Standard Operational Procedure</p>
Feedback on each option			
<ul style="list-style-type: none"> -Help to monitor MAs effectiveness -Need to be consistent with IPCC guidelines -Increase transparency and accuracy of data 	<ul style="list-style-type: none"> - Identify the ownership of the provided data but it requires a higher level of authority to enhance -Help to engage with the private sector (non-state stakeholders) to collect data 	<ul style="list-style-type: none"> - Improve transparency and accuracy of data 	<ul style="list-style-type: none"> - Can ease the process of data collection and information between the relevant ministries
Long term solutions (~10 years)			
<p>Option 3L-1. Reorganizing regulations related to climate change in individual legal systems</p>	<p>Option 3L-2. Developing legislation and detailed regulations including MRV guidelines for MAs</p>	<p>Option 3L-3. Creating a digital system to archive and track GHG emission reductions of MAs</p>	<p>Option 3L-4. Continuous improvement of the information collection system (including evaluation and feedback mechanism)</p>
Feedback on each option			
<ul style="list-style-type: none"> -Useful because countries have already developed some regulations on climate change -Existing regulations have some limitations so reorganizing helps to improve and update it 	<ul style="list-style-type: none"> -Allow countries to have detailed regulations to engage other ministries and private sector -Legal and official documentations of data collection is important 	<ul style="list-style-type: none"> -Require less time/burden to collect and share data and information -Increase transparency and consistency, and it ease to archive data from different sectors -May lack flexibility of updating and maintaining since it is a digital system 	<ul style="list-style-type: none"> -Can identify gaps and needs which can be used to secure international supports -Help further improvements and establish sustainable collection reporting

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**Institute for Global Environmental Strategies (IGES)
Climate and Energy Area**

2108-11 Kamiyamaguchi, Hayama, Kanagawa, 240-0015, Japan
Tell: 046-826-95592 Fax: 046-855-3809 E-mail: ce-info@iges.or.jp
www.iges.or.jp

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