



United Nations
Framework Convention on
Climate Change

TECHNOLOGY
EXECUTIVE
COMMITTEE

DEVELOPING AND ENHANCING ENDOGENOUS CAPACITIES AND TECHNOLOGIES

Technology Stakeholders' Perspectives





Executive Summary

In response to a request the Conference of Parties (COP) to the UNFCCC made at its twenty-first session, the UNFCCC Technology Executive Committee (TEC) undertook work on the development and enhancement of countries' endogenous capacities and technologies. In its preliminary work, the TEC observed a lack of common understanding among various stakeholders on what endogenous capacities and endogenous technologies are and what developing and enhancing them might mean. The TEC therefore considered it important to first address this issue by identifying elements and features that could be used to describe endogenous capacities and technologies and the ways they could be developed or enhanced. This is a report on the findings from that work.

As part of its work, the TEC sought inputs from other UNFCCC constituted bodies and from operating entities of the Financial Mechanism on the work, activities and projects they had undertaken that may be related to or contain elements of endogenous capacities and technologies. Responses indicated that no entities had undertaken work specifically relating to endogenous capacities or technologies. Nevertheless, elements thereof can be found in the projects and programmes of the Global Environment Facility (GEF) and the Green Climate Fund (GCF).

The TEC conducted surveys of relevant stakeholders and experts from April to June 2018 to gain insight into their views on the elements and features that could be used to describe, develop and enhance endogenous capacities and technologies. One targeted national designated entities (NDEs) and the other relevant technology observers and experts, including former TEC members. The survey results may help countries and UNFCCC institutions to enhance their understanding of and work on these issues.

A total of 92 stakeholders responded to the survey: 41 NDE respondents from 35 countries (88% from developing countries and 12% from developed countries) and 51 observers and experts from 31 countries (39% from developing countries and 61% from developed countries). The surveys found that NDEs and observers share views of elements and features that can define endogenous capacities and technologies. Nevertheless, the two groups emphasized somewhat different elements. NDEs emphasized the following capacities as the most crucial to defining endogenous capacities:

- Assessing climate-related technology needs from the individual to the national levels;
- Identifying appropriate technologies for meeting specific needs;
- Adapting technologies to local needs and conditions.



Observers emphasized a slightly different set of capacities.

The surveys revealed that respondents do not have clear definitions of endogenous capacities and endogenous technologies in mind. However, their views on these definitions clearly focused on in country ability to assess needs at all levels, and to identify and develop technologies that correspond to local needs and conditions. The surveys also showed that endogenous capacities are likely needed before endogenous technologies can be developed. Collaborative partnerships on developing endogenous technologies are already being formed although the focus, it seems, is the modification of existing technologies rather than the development of new ones.

On the basis of the results of its work so far, the TEC finds that the following general strategies may help to enhance endogenous capacities and technologies if tailored to specific country contexts:

- Adopt a participatory approach;
- Understand internal conditions;
- Facilitate partnerships with multiple sectors;
- Incorporate local and indigenous knowledge;
- Facilitate connections to funding;
- Provide tailored, multilevel training;
- Enhance capacities of NDEs;
- Monitor progress using indicators;
- Share knowledge widely.

The TEC recognizes that this work is only a first step. However, it is important in that it provides direction for future work. The TEC looks forward to continuing its work in this area and engaging with stakeholders and other UNFCCC institutions to help countries build their endogenous capacities and technologies in order to achieve the purpose and goals of the Paris Agreement.



1 INTRODUCTION



At the twenty-first session of the Conference of the Parties (COP) held in Paris in November and December 2015, the COP requested the Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN), in supporting the implementation of the Paris Agreement, to undertake further work relating to the development and enhancement of endogenous capacities and technologies.¹

In response, the TEC initiated such work in 2017 by looking at definitions of the term “endogenous” and exploring the concept and scope of endogenous capacities and technologies.² The study found a lack of common understanding about what constitutes endogenous capacities and technologies, with no standardized ways of assessing how they could be developed or enhanced. As a result, the TEC decided to conduct a further study on these matters.

For the purpose of this study, the TEC contacted other institutions for relevant information and conducted targeted surveys of relevant stakeholders and experts.³ This report on the findings from that work includes technology stakeholders’ perspectives on endogenous capacities and technologies and aims to improve the understanding of how Parties and relevant bodies, institutions and stakeholders approach the identification, development and enhancement of endogenous capacities and technologies.

1 Decision 1/CP.21, paragraph 66(b).

2 For more information, see “Development and enhancement of endogenous capacities and technologies: A preliminary study”, available at <https://goo.gl/oJTU5U>

3 For further details on the outcome of the study, see “Report on development and enhancement of endogenous capacities and technologies”, available at <https://goo.gl/YvNYf4>



2 RELEVANT WORK OF OTHER INSTITUTIONS

The TEC sought input from the operating entities of the UNFCCC Financial Mechanism and from constituted bodies on their work, activities and projects that may be relevant to or contain elements of endogenous capacities and technologies. The summaries and findings are outlined below.

Global Environment Facility

Endogenous capacities or technologies are not explicitly mentioned in the GEF Climate Change Mitigation Results Framework and the Climate Change Adaptation Results Framework. However, elements of developing endogenous capacities and technologies can be found in the results frameworks.

Often, the positive results achieved by GEF-funded projects are due to a number of related factors, including demonstration activities to support endogenous technologies, support to clean-technology entrepreneurs and start-ups, the promotion of policy and legal environments geared towards implementing projects for development, and the enhancement of endogenous capacities and technologies.

Many GEF projects facilitate greater collaboration among a variety of actors that otherwise would not interact with one another or collaborate easily, including civil society, public and private entities in academia, business and industry, and communities undertaking initiatives. These projects thereby play a crucial role in coordinating and facilitating the development of technological innovation systems.

Green Climate Fund

Although the current profiles of the GCF projects do not explicitly mention endogenous capacities or technologies, the GCF does focus on developing local and national capacities and, in particular, on soft technologies such as web portals, early warning systems, energy efficiency and renewable energy technologies.

Both the projects and the readiness support measures have great potential for establishing demand-driven approaches to developing capacities and technologies.



Adaptation Committee

The Adaptation Committee has been working with the Nairobi work programme to strengthen the use of indigenous knowledge and practices for adaptation, which may lead to the development and enhancement of endogenous capacities.

Paris Committee on Capacity-building

The Paris Committee on Capacity-building (PCCB) was established under the Paris Agreement. One of its mandates is to explore how developing country Parties can take ownership of building and maintaining capacity over time and space. This may be an area in which the TEC and the PCCB can collaborate and create synergies.

Least Developed Countries Expert Group

The Least Developed Countries Expert Group (LEG) has not carried out any work specifically on endogenous capacities and technologies, but has produced guidance on building capacities in the context of national adaptation plans. The TEC work on endogenous capacities and technologies may be a useful reference for future LEG work, for example as supplementary guidance.





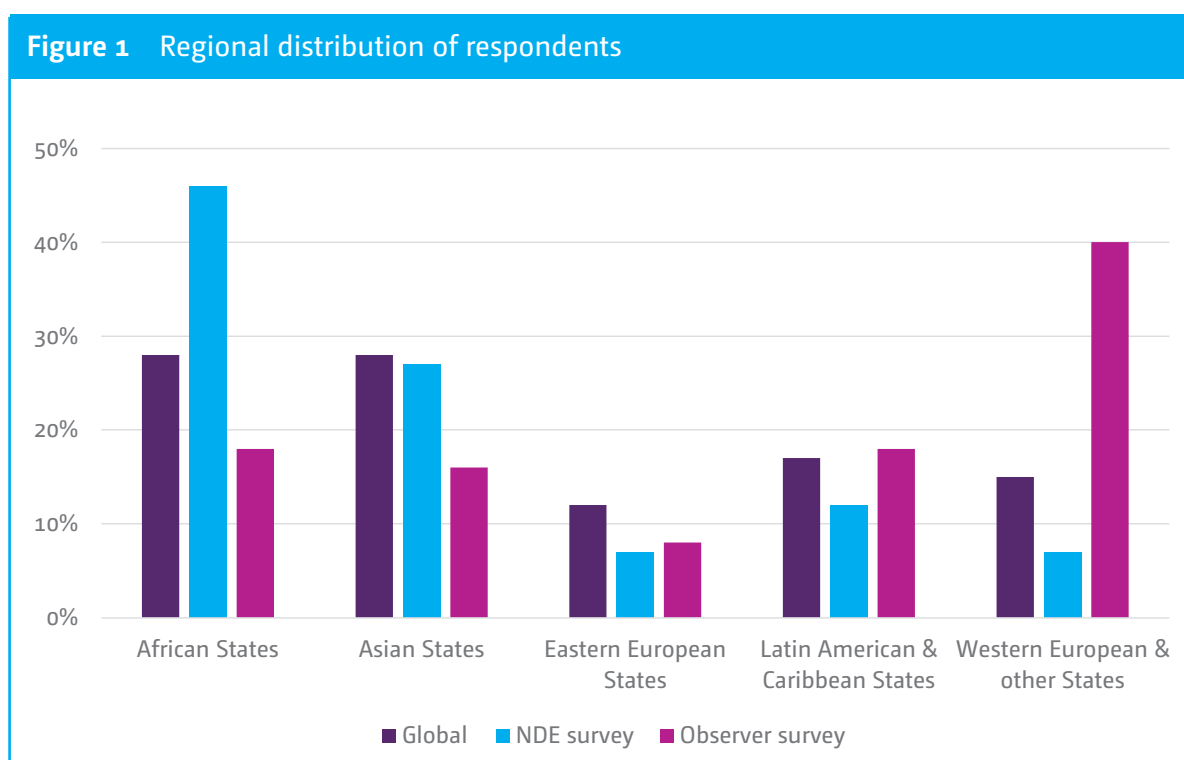
3 RESULTS AND ANALYSIS OF THE SURVEY

3.1 Survey overview

The TEC conducted two surveys of relevant stakeholders and experts from April to June 2018 to gain insight into their views on endogenous capacities and technologies. The TEC expected that the survey results would help it to identify elements and features that could be used to describe, develop and enhance endogenous capacities and technologies, as well as to help countries and UNFCCC institutions to enhance their understanding of and work on the issues.

The first survey (hereinafter referred to as the “NDE survey”) targeted the NDEs of the 159 countries that have appointed such entities. The second survey (hereinafter referred to as the “observer survey”) targeted current and former TEC members, observers who have attended TEC meetings, and those who are knowledgeable about climate technologies and capacity-building. The observer survey was also forwarded to all members of the PCCB and observers who attended its second meeting. The NDE survey consisted of 27 questions, and the observer survey of 20 questions.

A total of 92 stakeholders responded to the surveys, including 41 NDE respondents from 35 countries (88% from developing countries and 12% from developed countries) and 51 observers and experts from 31 countries (39% from developing countries and 61% from developed countries). Figure 1 shows the regional distribution of the respondents.



3.2 Survey results and analysis

Components of Endogenous Capacities

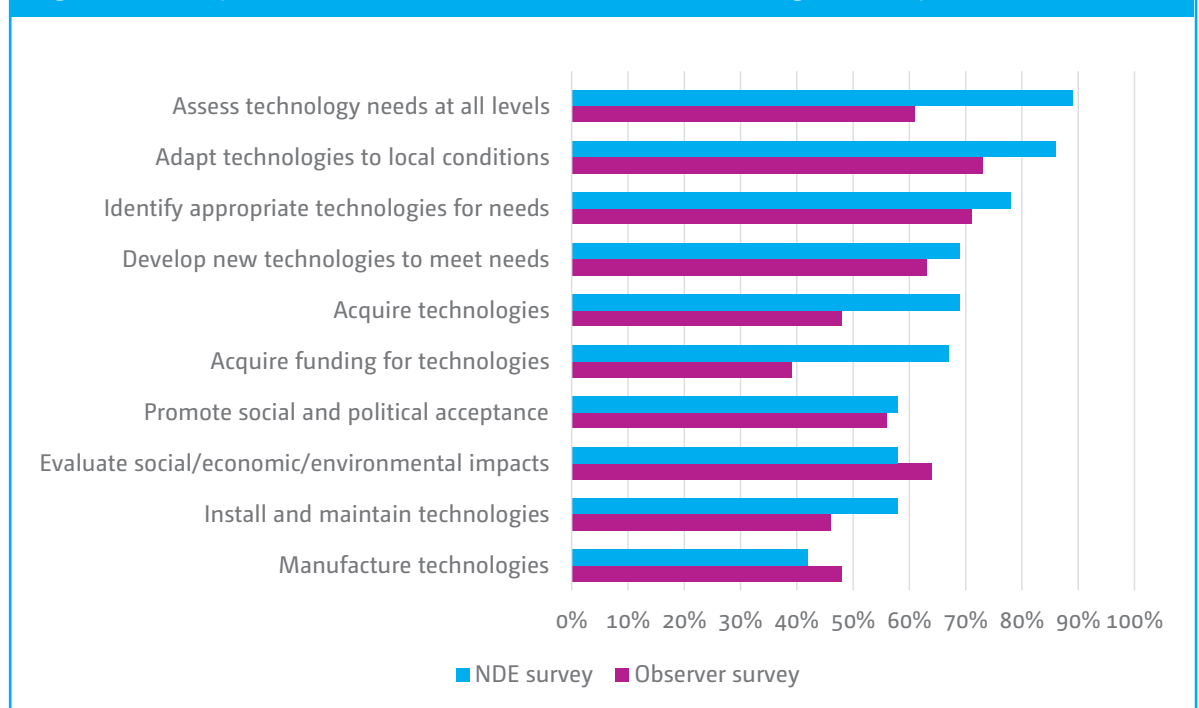
The NDE and observer surveys gathered respondents' views on what should be included in definitions of endogenous capacities. Both surveys asked respondents to indicate whether each of the 10 listed activities should definitely or probably be included, or definitely or probably not be included in the definition of endogenous capacities.

Figure 2 shows the percentages of NDE and observer survey respondents who said an activity should "definitely" be included in the definition of endogenous capacities. More than four out of five NDE survey respondents were in favour of including "Assess climate-related technology needs from the individual to the national levels" and "Adapt technologies to local needs and conditions". More than three out of four were in favour of including "Identify appropriate technologies to assist in meeting those needs".

The observer survey respondents gave somewhat lower scores than the NDE survey respondents, but were still fairly in favour of including these definitions. At least 6 of 10 observer survey respondents said they would "definitely" include "Adapt technologies to local needs and conditions", "Identify appropriate technologies to assist in meeting those needs", "Evaluate social, economic and environmental impacts of technologies", "Develop new technologies to meet needs" and "Assess climate-related technology needs from the individual to the national levels".

The NDE and observer survey responses differed the most when it came to "Assess climate-related technology needs from the individual to the national levels" and "Acquire funding", although the observers did indicate strong support for the former.

Figure 2 Components to be included in definitions of endogenous capacities

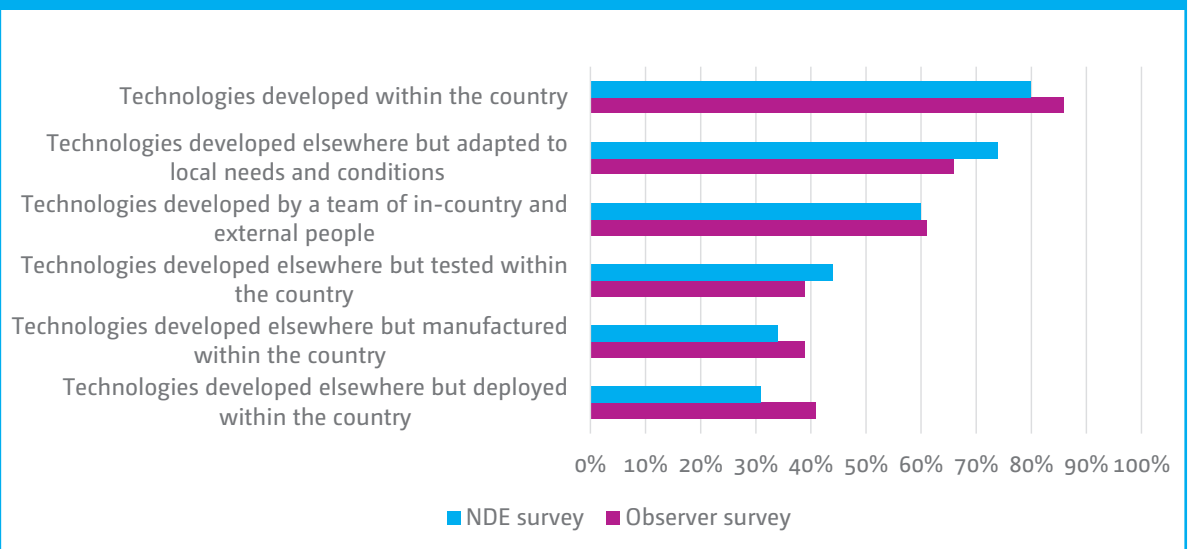




Components of Endogenous Technologies

Both surveys asked respondents to consider whether each of the six listed types of technology development should be included in a definition of endogenous technologies. Around 6 out of 10 respondents in both the NDE and observer surveys thought that each item should probably or definitely be included in a definition of endogenous technologies. Figure 3 shows how many survey respondents said each type of technology should “definitely” be included in a definition of endogenous technologies. As shown in this figure, NDEs and observers responded nearly identically. Technologies developed or adapted within the country were clearly important to the respondents in this context. Both groups gave their highest ratings to technologies developed within their own country, developed by a team of in-country and external people, or developed elsewhere but adapted to local needs and conditions. Technologies developed elsewhere but tested, manufactured, or deployed within the country had lower support for inclusion in the definition.

Figure 3 Components to be included in definitions of endogenous technologies



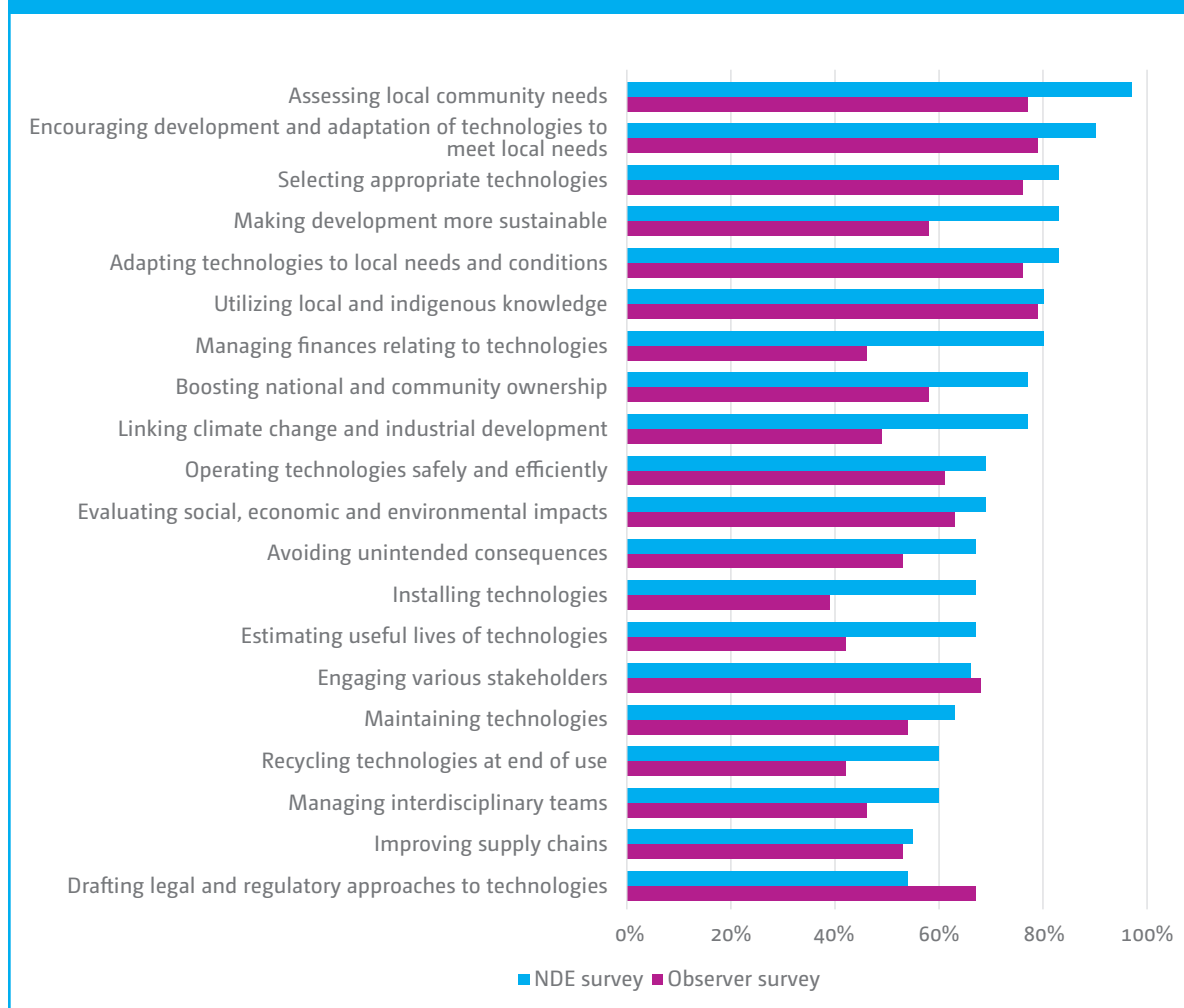
Usefulness of Training and Resources

In addition to views on definitions, the surveys asked which training and resources would be the most useful for enhancing a country's endogenous technologies and capacities. Each of the 12 listed activities was regarded as "very" or "somewhat" helpful by at least 66% of each of the two groups. For each activity, figure 4 shows the percentage of respondents who said that the activity would be "very" helpful.

In all but three cases, the usefulness ratings of NDE respondents were generally higher than those of observer respondents, although the differences were small. At least 9 out of 10 NDE survey respondents gave "very" helpful ratings to "Assessing local community needs for climate-related technologies" and "Encouraging development and adaptation of technologies to meet local needs". In addition, over 70% of both NDE and observer survey respondents were in favour of "Selecting appropriate technologies", "Adapting technologies to local needs and conditions" and "Utilizing local and indigenous knowledge".

Both surveys also asked about the types of organization respondents found most useful for dealing with climate technology issues. Both groups gave their highest ratings to business and industry. NDE respondents also said academics and municipal and local governments were very useful, while observer respondents gave their second highest ratings to practitioners.

Figure 4 Usefulness of training and resources



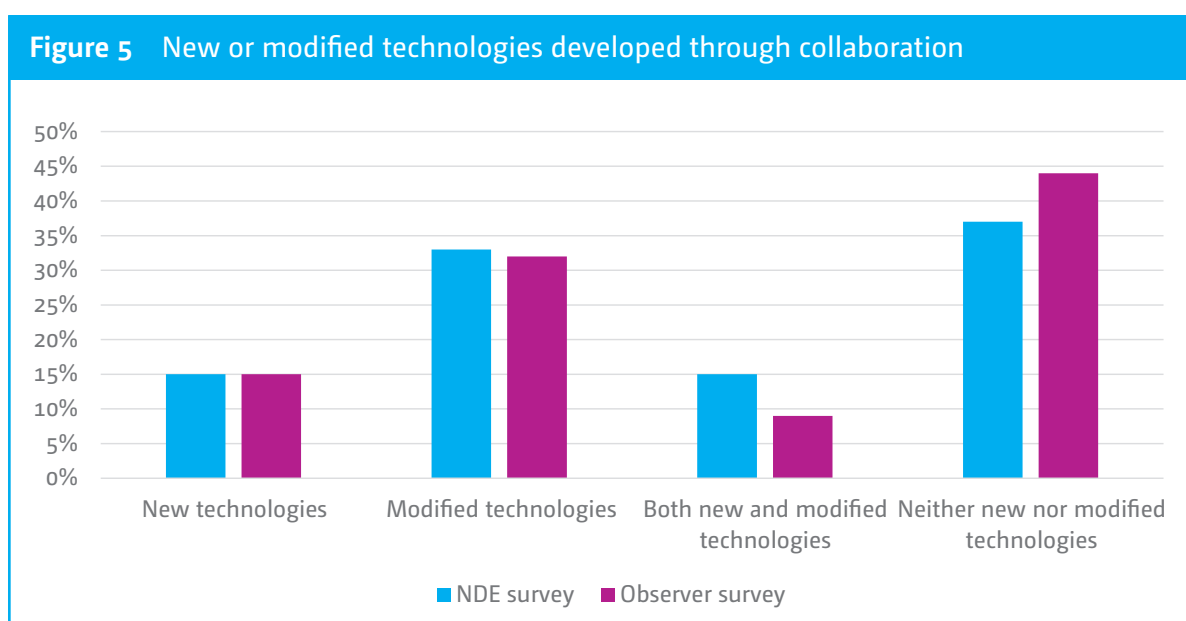
Collaborative Partnerships

Countries typically collaborate with numerous groups when addressing climate-related technology issues. The surveys attempted to identify the groups that most often engaged in partnerships and asked whether such collaboration led to the development of new or modified technologies.

NDE respondents reported that their countries had engaged in many partnerships and were the most likely to have collaborated with foreign academic institutions, individual researchers knowledgeable about technologies, international intergovernmental organizations or other national governments. Observers reported more partnerships in each category than the NDEs, but the rankings were similar. Furthermore, observers and their organizations were the most likely to have collaborated with international intergovernmental organizations and foreign academics.

The NDE survey asked whether collaborative work was conducted with individuals and/or organizations from developing countries or from developed countries. Most of the 27 respondents to this question reported that their country had collaborated with developed countries, and a majority had collaborated with a developing country. Very few reported collaborating exclusively with a developing country.

In order to explore the role that collaborative partnerships can play in these efforts, both surveys asked whether collaborative partnerships had developed new or modified environmental technologies. Figure 5 shows the responses, which were similar for the two groups. Nearly half of the respondents had developed modified technologies through collaboration, while fewer had developed new technologies. Over one in three had developed neither new nor modified technologies through collaboration.





4 CONCLUSIONS

4.1 Elements and features of endogenous capacities and technologies

Respondents of both surveys shared views on the concepts of endogenous capacities and endogenous technologies, namely that they cannot be limited to any single element or feature, and that they are not easily defined. Nevertheless, the respondents indicated the elements or features they think are the most relevant.

With regard to defining endogenous capacities, the respondents, especially the NDEs, put strong emphasis on the capacity to:

- **Assess climate-related technology needs from the individual to the national levels;**
- **Identify appropriate technologies to assist in meeting identified needs;**
- **Adapt technologies to local needs and conditions.**

With regard to defining endogenous technologies, the following features were highlighted by the respondents:

- **Technologies developed within the country or by a team of in-country and external people;**
- **Technologies developed elsewhere but adapted to local needs and conditions.**

Perceptions about the definitions of endogenous capacities and endogenous technologies clearly focused on in-country ability to assess needs at all levels and to identify and develop technologies in order to respond to local needs and conditions.



4.2 Ways to develop and enhance endogenous capacities and technologies

The TEC study findings suggest the following general strategies that can help to enhance endogenous capacities and technologies and which would need to be tailored to specific country contexts:

- **Adopt a participatory approach.** A participatory approach, involving all stakeholders, is crucial to identifying environmental, social, and economic needs and then defining priorities to determine the means for building capacity. Empowering social capital and increasing the level of community ownership will enhance the acceptance, integration and sustainability of the projects.
- **Understand internal conditions.** Collaboration, needs assessment, and technology selection and transfer require an understanding of the internal social, political, legal, regulatory, economic and other conditions.
- **Facilitate partnerships with multiple sectors.** Respondents were in favour of partnerships and reported that the academic and business sectors, along with local and municipal governments, contribute the most to the sustainable development of endogenous capacities and technologies.
- **Incorporate local and indigenous knowledge.** Local and indigenous people have a solid understanding of local needs and conditions. Their skills and knowledge should therefore be drawn on in assessing needs and adapting technologies to local needs and conditions. Additional resources and preparation may be needed for participating actors to enhance their intercultural communication and to work together respectfully and fruitfully.
- **Facilitate connections to funding.** Obtaining and maintaining technologies can be costly. Improving access to public funding, venture capital, strategic investors and other funding sources is essential to the enhancement of endogenous capacities and technologies.
- **Provide tailored, multilevel training.** Climate-related technologies require many types of competence, including that of risk assessors, technicians, legal advisors, funders, policymakers. Capacity-building activities should target appropriate groups on levels ranging from the local to the national and be designed to enhance the required skills and knowledge.
- **Enhance capacities of NDEs.** NDEs can play a major role in enhancing endogenous capacities and technologies. They may need support to develop their own capacity to assess technology needs, identify appropriate technologies and understand the demands and implications of existing processes such as technology needs assessments and the preparation of technology action plans, technology road maps and nationally determined contributions.
- **Monitor progress using indicators.** Countries may monitor and evaluate their progress in the development and enhancement of endogenous capacities and technologies. For this, they need indicators to measure progress, that take into account each country's needs and conditions, as well as the need for common indicators that may enhance transparency and comparability.
- **Share knowledge widely.** Enhancement of endogenous capacities and technologies will play an important role in the implementation of the Paris Agreement. Ongoing communications among stakeholders about relevant issues and best practices can help everyone involved with planning and reporting of activities.

4.3 Concluding remarks

As the policy arm of the UNFCCC Technology Mechanism, the TEC works to help Parties and relevant stakeholders to improve their understanding of technology issues and address climate change through technology development and transfer. The TEC hopes this report will serve to improve the understanding of endogenous capacities and technologies.

Parties and other stakeholders may wish to take into account the conclusions above when considering their own needs for capacity-building or when considering strategies for developing new technologies and adapting technologies to local needs. The studies referred to in this report may also help Parties to identify support or activities that may be helpful in reporting on endogenous capacities and technologies in their national communications and biennial reports.

The TEC, in collaboration with the CTCN, will continue its work on this issue in 2019. The TEC looks forward to working together also with the PCCB and other UNFCCC institutions and engaging with relevant stakeholders to help countries develop and enhance their endogenous capacities and technologies in order to achieve the purpose and goals of the Paris Agreement.



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About the Technology Executive Committee

The Technology Executive Committee is the policy component of the Technology Mechanism, which was established by the Conference of the Parties in 2010 to facilitate the implementation of enhanced action on climate technology development and transfer. Along with the other component of the Technology Mechanism, the Climate Technology Centre and Network, the committee is mandated to facilitate the effective implementation of the Technology Mechanism.

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