



Quality of Science & Technology Policy

An Assessment Toolkit

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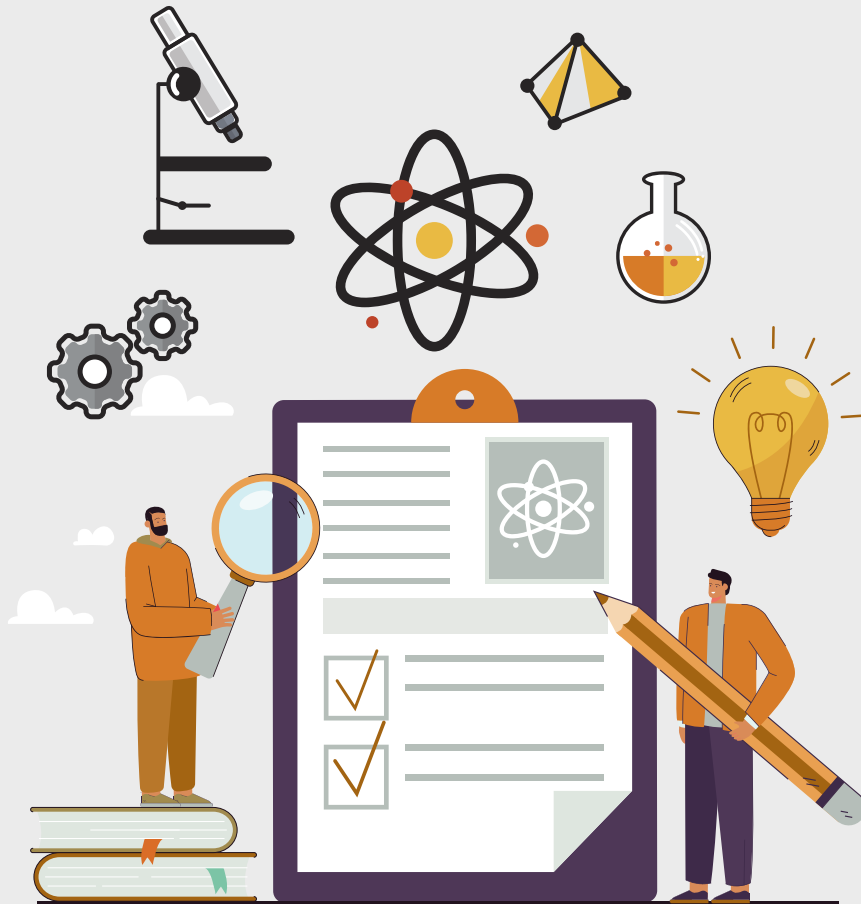
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Acknowledgments

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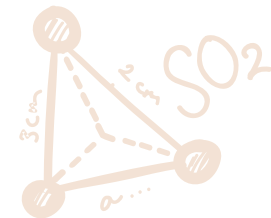
We are thankful to Ravi, our in-house designer, whose skills have enhanced the visual appeal of this report. Lastly but importantly, we also thank our interns, Bhavya Pandey, Shinjini Mitra and Mohammad Zayaan, who lent their research support in putting together this toolkit.

Introduction

Policies impact the socio-economic development of a country, determine the aspirations for its global competitiveness, and affect the social and economic future of members and entities of the society. While policies impact its stakeholders and the country's overall potential course of action for a particular subject in question, a good policy is evidence-based, inclusive, receptive to the needs of its stakeholders, and is critical in defining a framework that shall be best utilised to serve its intended purpose. It is adaptable, realistic, unambiguous, transparent and facilitates accountability and space for a theory of change.

Science and Technology (S&T) policies of a country alter how individuals & entities of the science, technology, and innovation (STI) ecosystem interact with each other and determine how several resources are to be allocated to serve the best interest of the public. In the age of rapidly emerging technology solutions and S&T-based innovations, it becomes critical to proactively (re)shape public policies for the best socio-economic development outputs.

Evaluation and impact assessment plays a crucial role in bringing efficiency, assessing the relevance and maximising the effectiveness of public policies in a country. This toolkit takes into account several metrics that help identify characteristics of a sound S&T policy. Metrics like Collaboration, Resources & Research, Entrepreneurship & Innovation, and Environment & Sustainability establish the outcomes and effectiveness of this policy, whereas metrics like Transparency, Accountability & Administration help in assessing the clarity and impact of the policy.



Literature Review

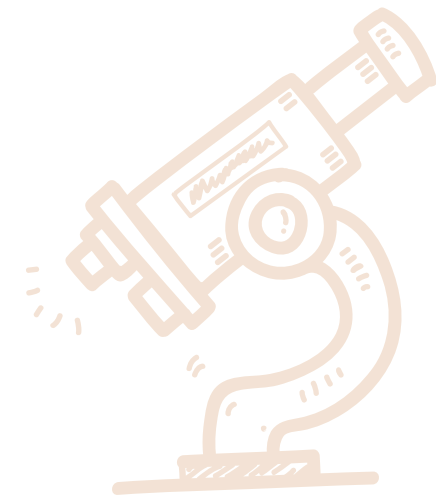
Several national and international organisations have attempted to provide guidelines and frameworks for evaluating Science, Technology & Innovation (STI) policies. Frameworks by the United Nations Conference on Trade and Development (UNCTAD) and the Economic and Social Commission for Asia and the Pacific (ESCAP), for instance, have indicators of to what extent a policy considers (or promotes) sustainable development goals (SDGs) and grassroots innovation.

The OECD Committee for Scientific and Technological Policy (CSTP) publishes reports, case studies and other S&T policy content, to encourage cross-member-country cooperation and facilitate synergy between the S&T policy and other governmental policies of the country. Several other pieces of literature also attempt to evaluate the impact of a policy.

The OECD STIP Compass and a few other resources and dashboards have attempted to assess a country's STI policy ecosystem on the basis of the presence of certain kinds of schemes, programs and policy documents. Though this provides a good overview and reference repository for the STI policy ecosystem of a country, it fails to analyse the nuances and quality of these policies.

Moreover, there is a general lacuna in terms of cross-cutting and in-depth S&T policy evaluation toolkits that could assess the process of policymaking as well as the policy itself.

The need for an assessment toolkit that looks at S&T policies and their policymaking process from a more in-depth and holistic point of view is evident. Metrics like transparency, accountability, entrepreneurship and research considerations are missing in most of the available toolkits and frameworks. Thus, this toolkit aims to provide a suited guideline for policymakers and others, and fill this gap, for those who wish to assess the quality of science and technology policies of a country holistically.



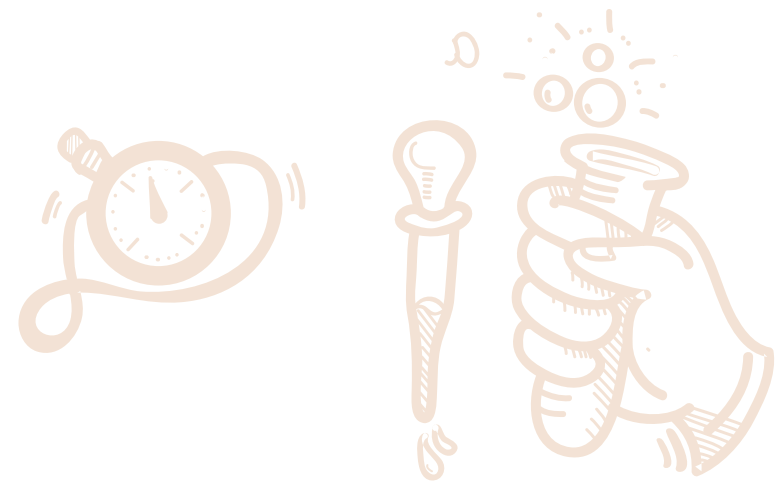
Toolkit Usage Guidelines

Policymakers and those using this toolkit are advised to use this framework for bonafide evaluation of various aspects of the policy to understand areas of improvement and assess the policy's performance on specific sub-metrics. This toolkit has been created to primarily guide the assessment of the quality of a specific science & technology policy rather than for comparing policies. If one wishes to compare policies with differing numbers of applicable questions in a sub-metric of the toolkit, they are advised to adjust for denominators of the sub-metric.¹

The scorer is advised to read the information provided with questions (if any) and carefully check the applicability of each question. Guidelines, definitions, examples and extra information has been provided for ease of reference and assessment, wherever necessary.

Questions that are not applicable do not count against your points. Calculate the total available points under each metric after considering the applicability guidelines of the questions. Add the points scored by the policy under each sub-metric, using the last column of the table, to get the total points scored in each metric. Use these two numbers to calculate the percentage obtained for the metric. Space for this tabulation has been provided at the end of each metric.

Lastly, use the weights assigned to each metric for calculating the grand total (weighted average percentage) score of the policy.



¹ This can be done by calculating and adjusting for the lowest common denominator

01

Transparency

Transparency is one of the essential elements of creating a better legal and policy framework. It is important that there is a flow of vital information like budgetary reports, financial statements and other data for the comprehension and transparency of any policy. Additionally, there is a need to have public consultation, comments and suggestions to create a concrete policy, and have a free flow of information between the implementers of a policy and the public. It is also key to ensure a smooth interface amongst the stakeholders, through appropriate mechanisms for review and feedback. Questions listed below under each sub-metric (1.a to 1.e) assess the transparency of the S&T policy.

1.a Availability of the policy in the public domain

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
1.a.1	Is the entire policy currently available on the government department or office's website?		If yes, give 0.8. If only part of it is available, give 0.4. If not available, give 0.	0.8	
1.a.2	Is the policy document available in official and regional languages?	<p>Official/regional languages for this purpose would be the ones recognised by the country for use by governmental bodies and legislative bodies.</p> <p>(The purpose of this question is to assess the accessibility of the policy for different ethnic groups of the country. The metric can be tweaked to assess the specific case of the country, depending on the percentage of people speaking a language in the country as well as the currently recognised status of languages in the country.)</p> <p><i>Example: For India, these languages would include English and the languages mentioned in the 8th Schedule of the constitution</i></p>	<p>If the country is a single language country, the question will be Not Applicable (NA)</p> <p>a) If only two languages exist and policy is available in both, give 0.2. b) If more than two languages exist: and policy is available in all, give 0.2 OR if policy is available in more than two regional languages but not all, give 0.1 if only released in two or one major language despite more than two or several other official/regional languages existing in the country, give 0.</p>	0.2	

1.b Consultations and comments

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
1.b.1	Was the policy made available for public consultations and comments: (a) Online (b) Offline	If either or both answered yes, answer row 1.b.2 to 1.b.7. Else mark 1.b.2 to 1.b.7 as 0 (do not treat as not applicable)	If yes, for online, give 0.1. If yes, for offline, give 0.1. If none, give 0.	0.2	
1.b.2	Were multiple rounds of stakeholder consultation held?	If 1.b.1 is Yes, only then answer this question. Else mark 0	If only one round of consultation was held, give 0.1. If more than one round, give 0.2. Otherwise, give 0.	0.2	
1.b.3	Was the announcement for public consultation and comments made in leading newspapers of the country?	If 1.b.1 is Yes, only then answer this question. Else mark 0	If yes give 0.1, If no, give 0.	0.1	
1.b.4	Was the announcement for public consultation and comments made in regional newspapers?	If 1.b.1 is Yes, only then answer this question. Else mark 0 For the purpose of this assessment, 'regional newspapers' are defined as newspapers that are widely distributed within the primary administrative divisions' territorial boundaries of a country.	If yes give 0.1, If no, give 0.	0.1	

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
1.b.5	Were the received comments and suggestions made available to the public on the relevant government website?	If 1.b.1 is Yes, only then answer this question. Else mark 0	If yes, give 0.2, If no, give 0.	0.2	
1.b.6	Was adequate time given to the public for comments? (Minimum period of 30 days)	If 1.b.1 is Yes, only then answer this question. Else mark 0	If yes, give 0.1, If no, give 0.	0.1	
1.b.7	Were consultations with non-governmental and private bodies made during the policymaking process? (ensuring participation by these stakeholders was proactively sought)	If 1.b.1 is Yes, only then answer this question. Else mark 0	If yes, give 0.1. If no, give 0.	0.1	

1.c Supporting documents/data and feedback mechanism

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
1.c.1	Are supporting documents and data easily accessible for the public?	These documents and data include drafting committee member details, memos, preliminary research, etc. If you need to file a query/request for info, then treat it as not easily accessible.	If supporting documents and data are easily accessible, give 0.2. But if the documents and data are not easily accessible, give 0.	0.2	
1.c.2	Does the policy have a feedback mechanism in place? (ex-post)	If answered yes, answer row 1.c.2 and 1.c.3. Else mark 1.c.2 and 1.c.3 as 0 (do not treat as not applicable)	If yes, give 0.4. Otherwise give 0.	0.4	
1.c.3	Has a specific authority/body been identified to address the feedback?	If 1.c.2 is Yes, only then answer this question. Else mark 0	If yes, give 0.2. Otherwise, give 0.	0.2	
1.c.4	Has a specific timeline been defined for the feedback to be addressed?	If 1.c.2 is Yes, only then answer this question. Else mark 0	If yes, give 0.2. Otherwise, give 0.	0.2	

1.d Defined timeline for policymaking and advice by experts

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
1.d.1	Have defined timelines for the various stages of the policy making process been made publically available?	The policy should have clearly identified the timeline for different stages of drafting the policy, consultations, and implementation	If yes, give 0.5. If no, give 0.	0.5	
1.d.2	Is there a provision for scientific & technological advice to be provided by experts (scientists, researchers, academicians, etc) to the Government (ex-post)?	This could also be a pre-existing process. Irrespective of the time it came into existence, provide a positive score if such a provision exists	If yes, give 0.5. If no, give 0.	0.5	

1.e Committees²

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
1.e.1	Are any specific (specialised) committees to be set up under the policy?	(If yes, answer 1.e.2 to 1.e.6. If no, treat all questions in 1.e as not applicable)	Only a gating question. Not to be scored	0	
1.e.2	Were the qualification requirements for the committee(s) provided?	If 1.e.1 is Yes, only then answer this question. Otherwise mark as not applicable	If yes, give 0.2. Otherwise give 0.	0.2	
1.e.3	Is there a selection criteria for committees laid out?	If 1.e.1 is Yes, only then answer this question. Otherwise mark as not applicable	If yes, give 0.2. Otherwise give 0.	0.2	
1.e.4	Is the term and duration of the committee members defined?	If 1.e.1 is Yes, only then answer this question. Otherwise mark as not applicable	If yes, give 0.2. Otherwise give 0.	0.2	

2. Scorer is advised to check supporting and other documents on the website of the concerned department to answer the questions in this submetric.

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
1.e.5	Has appropriate stakeholder balance been taken into consideration in the committees (adequate representation)?	If 1.e.1 is Yes, only then answer this question. Otherwise mark as not applicable	If yes, give 0.2. Otherwise give 0.	0.2	
1.e.6	Are the names of the committee members made public?	If 1.e.1 is Yes, only then answer this question. Otherwise mark as not applicable	If yes, give 0.2. Otherwise give 0.	0.2	

Tabulation for metric 1: Transparency

Tabulate the total points you have scored so far and the total number of points available to you (across sub-metrics 1.a to 1.e). Questions that are not applicable do not count against your points scored and available points.

Points Scored [PS1] : Available Points [AP1] :

Percentage Obtained: $P1 = (PS1/AP1 * 100)$

02

Accountability and Administration

Identification of all entities involved in the policy-making and implementation of the policy, and demarcating their roles and responsibilities, creating appropriate timelines for implementation of constituent tasks, and devising necessary oversight regulatory mechanisms for impact assessment and mandate alignment, are a few of the ingredients to ensure that authorities are held responsible to all stakeholders. Ensuring limited delegation of responsibilities and limited discretion in the interpretation of the policy, are key parameters that this metric assesses. Questions listed below under each sub-metric (2.a to 2.c) assess the accountability and administration of the S&T policy.

2.a Decision making and implementation organs

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
2.a.1	Does the policy clearly define the relevant bodies responsible for decision making & implementation of the policy?	Scorer is advised to check if a decision making/implementation body has been identified for various provisions and new policy interventions outlined in the policy	If in all cases there is a body defined, give 0.4. But if in most but in not all cases a body defined, give 0.2. But if most/all cases there is no body, give 0.	0.4	
2.a.2	Are the roles and responsibilities of all bodies/entities & individuals responsible for policymaking clearly defined in the policy?	Scorer is advised to check if the policy limits the delegation of responsibilities/powers to the bodies/executives	If in all cases there is a limit, give 0.4. But if in most but not all cases there is a limit, give 0.2. But if in most/all cases there is no limit, give 0.	0.4	
2.a.3	Does the policy enumerate responsibilities among various organs for the implementation ?		If yes, 0.2. If no, 0.	0.2	

2.b Institutional architecture

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
2.b.1	Are policy and regulations administered uniformly among all stakeholders and sectors?		If yes, give 0.2, If no give 0.	0.2	
2.b.2	Does the policy look to establish a decentralised institutional mechanism for the governance of the STI ecosystem?		If yes, give 0.2, If no give 0.	0.2	
2.b.3	Does the policy specify an institutional architecture that allocates defined duties between states and centre?	Only applicable for countries with a federal structure.	If yes, give 0.2, If no give 0.	0.2	
2.b.4	Does the policy outline the process for authority-responsibility area portfolio coordination among various bodies engaged in the policy implementation process?		If yes, give 0.2, If no give 0.	0.2	
2.b.5	Does the policy have a provision for an oversight regulatory mechanism for mandate alignment?		If yes, give 0.2. If no, give 0.	0.2	

2.c Impact and interpretation

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
2.c.1	Does the policy outline the initial indicators to evaluate the possible impact that the proposed interventions will, or are likely to have?	<p>Initial Condition: The existence of a STIP review process/(announcement of the same to be done) would be considered to imply that the country intends to assess the possible impact of its policy - thus satisfying the initial condition</p> <p>Scorer is advised to check allied documents and any existing institutional mechanism in the country for S&T policy evaluation. Some examples and forms of institutionalisation of STI assessment can be found in the 'Evaluation and impact assessment of STI policies' document by OECD (refer to Table 2 in the document)</p>	If the initial condition is satisfied, give 0.4. If indicators for evaluation have also been identified, give additional 0.2.	0.6	
2.c.2	Is there a committee/body to evaluate the post-facto unintended consequences of the policy?		If yes, give 0.2, If no give 0.	0.2	

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
2.c.3	Does the interpretation clause of the policy a) provide sole discretion to authorities on interpretation b) provide guidelines for interpretation	Interpretation clause in this context is referred to a clause that specifies how the whole policy/parts of the policy can be/are to be interpreted.	<p>If the policy does not have an interpretation clause/provision, mark NA.</p> <p>a) If the interpretation clause/provision allows the policymaking body/or other authorities to have the sole discretion on the interpretation of the policy - give 0.</p> <p>b) If the interpretation clause provides guidelines on how the interpretation of certain grammatical aspects and/or provides context for a part/whole of the policy, give 0.2</p> <p><i>Example: Interpretation clause states "words are to be understood in their ordinary sense/meaning"</i></p>	0.2	

Tabulation for metric 2: Accountability and Administration

Tabulate the total points you have scored so far and the total number of points available to you (across sub-metrics 2.a to 2.c). Questions that are not applicable do not count against your points scored and available points.

Points Scored [PS2] : Available Points [AP2] :

Percentage Obtained: $P2 = (PS2/AP2 * 100)$

03

Inclusion

For any policy to realise its outcomes, it is imperative for it to hold to the idea of inclusion. This helps in the ownership and ensures the social, economic, and societal objectives of the policy are met. This includes removing existing barriers to the participation of the minority and marginalised communities. This toolkit also assesses provisions that remove existing barriers for newly established and/or poorly funded and/or neglected institutions & organisations. Questions listed below under each sub-metric (3.a to 3.c) assess the S&T policy on inclusion.

3.a Inclusion of specific groups/communities

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
3.a.1	Does the policy look to remove any existing barriers for minority groups and other marginalised communities to participate in the S & T ecosystem?	Scorer is advised to check for the minority groups and marginalised groups of the country (these might include but not be limited to: Women, the LGBTQ+ community, Tribals, persons with disabilities)	<p>Only to be answered if any specific barriers exist currently. Otherwise, mark NA</p> <p>If it identifies the need to remove the barriers and states that it shall work towards it but does not define 'how': 0.2,</p> <p>But if the policy clearly outlines how it shall work to remove the barriers for marginalised groups (example: makes budgetary allocations, outlines a strategy, etc): give 0.4,</p> <p>If it does not do either, give 0.</p>	0.4	
3.a.2	Does the policy address lack of participation from under-represented regions of the country? <i>(eg: communities from geographically remote locations)</i>	Scorer is advised to check if the policy limits the delegation of responsibilities/ powers to the bodies/executives	<p>Question to be treated as applicable only if there is a skewness in region-wise participation (not applicable if under-represented regions are uninhabited/extremely sparsely populated)</p> <p><i>If applicable:</i></p> <p>If policy only identifies lack of participation as an issue, give 0.1 But if policy also displays intent to improve participation, give 0.2, if none, give 0.</p>	0.2	

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
3.a.3	Is there a provision for enhancement in assistive technologies for Persons with Disability (PwD)?	If the policy does not have a provision for this, scorer is also advised to check the existence of a scheme/programme/another policy already in place for the same	If the policy has a provision or a scheme/programme/another policy already exists, give 0.2, if not, give 0.	0.2	
3.a.4	Is the policy gender inclusive through the stages of the policy cycle?	The primary objective of a gender sensitive policy cycle is to design and implement policies that do not reinforce existing gender inequalities and attempt to redress existing gender inequalities	<p>Question is to be treated as applicable only if barriers to gender inclusivity exist in the STEM ecosystem of the country.</p> <p>Use the following relative marking scale to accord marks:</p> <p>a) Gender negative: if gender inequalities are reinforced to achieve desired outcomes or the policy uses gender norms, roles and stereotypes that reinforce gender inequalities (give 0)</p> <p>b) Gender agnostic: If gender is not considered relevant or is indifferent to outcomes (give 0)</p> <p>c) Gender positive: If policy seeks to remove barriers to gender inclusion in the STEM ecosystem (give 0.2)</p> <p>(The policy can only be marked for one of the above stages on the scale)</p>	0.2	

3.b Reducing bias

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
3.b	Were efforts made to reduce evidentiary biases in the policymaking/drafting process?	<p>Evidentiary bias includes “confirmation bias, sunk cost bias, and an understanding of the wishes of those whom they seek to help”.</p> <p>These efforts can include “removing incentives that lead to particular biases, or formalising rules that force decisionmakers to see issues from a different perspective”</p> <p><i>Reference: Reflective study by World Bank and recommendations suggested in https://www.ijhpm.com/article_3138_629.html</i></p>	<p>If yes, give 0.2. If no, give 0.</p> <p><i>(If data on documentation of the policymaking process is unavailable to answer this question, give 0.)</i></p>	0.2	

3.c Inclusion of specific institutions & organisations

S. No.	Question	Information/ Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
3.c	Does the policy have provisions to remove any existing policy barriers for newly established and/or poorly funded and/or neglected institutions & organisations?		<p>Only to be answered if any specific barriers exist currently. Otherwise mark NA.</p> <p>If it only addresses the existence of such barriers but does not outline a strategy for removal of barriers, give 0.</p> <p>But if the strategy is outlined - answer both a) and b):</p> <p>a) If it has provisions outlining removal of the barriers for newly set up enterprises/institutions/organisations: give 0.2 points</p> <p>b) If it has provisions outlining removal of the barriers for Poorly funded/Neglected institutions/organisations (such as geographically remote institutions/organisations): give 0.2 points.</p>	0.4	

Tabulation for metric 3: Inclusion

Tabulate the total points you have scored so far and the total number of points available to you (across sub-metrics 3.a to 3.c). Questions that are not applicable do not count against your points scored and available points.

Points Scored [PS3] : Available Points [AP3] :

Percentage Obtained: $P3 = (PS3/AP3 * 100)$

04

Collaboration, Resources and Research

Through global partnerships, transnational S&T networks, and national-level collaborations new forms of ideas of science and technology are emerging, allowing global and regional policy processes to coexist alongside nation-state policy processes. These collaborations assist in resource and knowledge sharing among developed and developing nations, creating better and more efficient systems. Additionally, private-public collaborations, joint training programmes, and increasing adoption of open science also help in skill-building among various sectors. It is essential for science & technology policies, in particular, to reflect this strategy for coaction, and the free flow of resources and research. Questions listed below under each sub-metric (4.a to 4.e) assess the S&T policy on areas related to collaboration, resources and research.

4.a Foreign collaborations and consortia

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
4.a.1	Does the policy improve transnational collaborations or have provisions to collaborate with other countries for science & technology projects?		If yes, give 0.2. If no, give 0.	0.2	
4.a.2	Does the policy remove existing barriers to the participation of citizens in foreign STEM exchange programmes and collaborative opportunities?		If yes, give 0.2. If no, give 0.	0.2	
4.a.3	Is the country part of cooperation groups or consortia institutionalised through the science and technology policy landscape?	Participation in multi-national groups or consortia of stakeholders such as academics, manufacturers, or government stakeholders only to be considered. (If answered yes, answer 4.a.4 and 4.a.5. Else mark 4.a.4 and 4.a.5 as 0 (do not treat as not applicable)	If yes, give 0.2. If no, give 0.	0.2	

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
4.a.4	Is the country an active participant in said groups/consortia?	If 4.a.3 is Yes, only then answer this question. Else mark 0	<p>If the country has been actively attending engagements/meetings in all/most groups/consortia: 0.2</p> <p>If the country has not been actively attending engagements/meetings in most/all groups/consortia, give 0.</p>	0.2	
4.a.5	Is the country following through with financial commitments and non-financial commitments as a part of the consortium?	If 4.a.3 is Yes, only then answer this question. Else mark 0	If yes, with respect to financial commitments, give 0.1. If yes, with respect to non-financial commitments, give 0.1. If no, give 0.	0.2	

4.b Collaborations

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
4.b.1	Does the policy remove existing barriers to collaborations (other than research), among innovators, institutes, organisations & researchers of the country?		If yes, give 0.2. If no, give 0.	0.2	
4.b.2	Does the policy display intent to foster collaboration between the private and public sector of the country?		<p>If policy only expresses intent but does not outline the strategy and sector/purpose, give 0.1.</p> <p>But if it expresses intent and outlines the strategy and/or sector/purpose, give 0.2.</p> <p>If neither, check for existing Private-Public Partnership (PPP) models of S&T ventures/projects in the country. If they exist, give 0.1. If they don't exist as well, give 0.</p>	0.2	

4.c Open science

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
4.c.1	Does the policy remove existing barriers to sharing of technology in the country?	Such barriers could include restrictive technology sharing policies and bureaucratic hurdles	If the policy removes existing barriers or provides a strategy to enhance technology sharing, give 0.2. If no, give 0.	0.2	
4.c.2	Is open and universal access and sharing of scholarly knowledge encouraged through the policy?	<p>Scorer is encouraged to check if interventions/policies already exist for the same. If yes, mark positive.</p> <p>Green open access is referred to as free access to a certain pre-print/post-print/manuscript of the final product.</p>	<p>Answer both a) and b)</p> <p>a) If the policy allows for open access to publicly funded research, give 0.2</p> <p>But if the policy allows only green open access, give 0.1</p> <p>b) If the policy encourages sharing of scholarly knowledge: give 0.2</p> <p>If none of the above, give 0.</p>	0.4	
4.c.3	Does the policy provide mechanisms for resource sharing, other than scholarly knowledge & shared technology? [example: sharing of infrastructure (such as facilities), Human Resource, Networking & Computational Facilities, Industrial R&D Support, etc.]		<p>If yes, for all list resource examples, give 0.4.</p> <p>If yes for most resources, give 0.3</p> <p>If yes for some/more than one of the examples listed, give 0.2</p> <p>If none, give 0.</p>	0.4	

4.d Research ethics

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
4.d.1	Does the policy lay down regulatory and ethical guidelines regarding research conduct and procedures under the purview of the policy?	<p>This includes guidelines to ensure the respect of persons and subjects, equitable distribution of research trials/ experiments, and other oversight pertaining to the design and conduct of research</p> <p>Scorer is encouraged to check if guidelines already exist for the same. If yes, mark positive</p>	If yes, give 0.2. If no, give 0.	0.2	
4.d.2	Does the policy lay down guidelines for good science practices including standard operating procedures, training, etc?	<p>These guidelines include resources which enable the creation of a responsible research community</p> <p>Scorer is encouraged to check if guidelines/resources already exist for the same. If yes, mark positive</p>	If yes, give 0.2. If no, give 0.	0.2	

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
4.d.3	Does the policy provision for an ethical review committee or other relevant decision-making and enforcing body to address issues of ethics in scientific research?	Scorer is encouraged to check if interventions already exist for the same (intramural and extramural). If yes, mark positive	<p>Answer both a) and b)</p> <p>a) Intramural: If guidelines for creation/operation of Institutional Review Boards (IRBs) or ethics boards or other similar bodies within institutes/ organisations that ensure that the experiment follows ethical standards are provided/exist, give 0.1. If no, give 0</p> <p>b) Extramural: If provision for an external ethical review committee/similar body exists, give 0.1. If not, give 0.</p>	0.2	

4.e Holistic research

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
4.e.1	Does the policy discuss the positive social impact that the research in the country has/can have?	<p>Scorer is advised to check for</p> <ol style="list-style-type: none"> 1. Mention of use of research for social good and/or 2. Potential of research for societal use <p><i>Example: Strategy for public health research to solve key public health issues faced by the country</i></p>	If the policy only mentions need for research with potential social impact, give 0.1. But if the policy mentions an outlined strategy for enhancing research for social impact, give 0.2 instead. If none of the above, give 0.	0.2	
4.e.2	Does the policy address both foundational research and translational research (or both basic research & applied research)?	<p>Basic/foundational research works towards enhancing the understanding of fundamental aspects of a subject. (Example: Policy strategy for enhancing foundational/basic research knowledge in the field of virology)</p> <p>Applied/translational research works towards enhancing research for practical application/use of the subject. (Example: Policy strategy for enhancing applied/translational research for creation of new vaccinations)</p>	If the policy does not address research (lays emphasis on neither) or if the policy addresses only one of the two, give 0. If it encourages both, give 0.2.	0.2	
4.e.3	Does the policy address improvement in the quality of research?	<p>Scorer is advised to check for</p> <ol style="list-style-type: none"> 1. Existence/creation of mechanisms for assessing quality of research 2. Strategy for improving quality of research 3. Strategy to foster globally competitive research 	If yes for at least one, give 0.2. If no, give 0.	0.2	

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
4.e.4	Does the policy address measures to improve the environment for research (working conditions, mobility of researchers, administration)?	<p>Scorer is advised to check for</p> <p>a. Guidelines for institutions to ensure efficient management (administration) of research</p> <p>b. Strategy to improve working conditions/ environment for research</p> <p>c. Policy enhances the mobility of researchers</p>	<p>If yes, for at least 2 out of 3 (from a to c) give 0.4.</p> <p>But if yes only for 1 of the 3, give 0.2.</p> <p>If answered no for all 3, give 0.</p>	0.4	

Tabulation for metric 4: Collaboration, Resources and Research

Tabulate the total points you have scored so far and the total number of points available to you (across sub-metrics 4.a to 4.e). Questions that are not applicable do not count against your points scored and available points.

Points Scored [PS4] : Available Points [AP4] :

Percentage Obtained: $P4 = (PS4/AP4 * 100)$

05

Entrepreneurship and Innovation

Due to the rapidly evolving nature of the science, technology, and innovation (STI) policy landscape, it is critical to evaluate the policy's future preparedness in emerging domains and its efforts in removing barriers faced by innovators and inventors. The policy must also remove any innovation inhibiting distortions from the markets and have a clear strategy to improve intellectual property rights. The evaluation of the policy on this metric has been envisaged to assess the impact of the policy on innovation and entrepreneurship. Questions listed below under each sub-metric (5.a to 5.c) assess the S&T policy on areas related to entrepreneurship and innovation.

5.a New fields of science and technology

S. No.	Question	Information/ Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
5.a.1	Does the policy facilitate future preparedness in emerging sectors/domains of science and technology?		If it discusses the development of the upcoming fields of science and technology- give 0.2 If no, give 0.	0.2	
5.a.2	Does the policy have a provision for innovation training (plan for adapting to new innovations)?		If yes, give 0.2. If no, give 0.	0.2	

5.b Intellectual property

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
5.b.1	Does the policy remove any existing barriers that impede innovators and inventors from engaging in intellectual property creation?	<p>Applicable only if regulations exist that impede the holders of intellectual property OR if the country is known to have a poor Intellectual Property Rights regime (Scorer is advised to refer to World Intellectual Property Organization (WIPO) resources and latest performance of the country on International IP Index : Any country performing below global average should be considered applicable for assessment under 5.b)</p> <p><i>Note: IPR includes patents, trademarks, copyrights and other Intellectual properties</i></p>	<p>If the policy recognises existence of barriers/ acknowledges lack of proper IPR regime but does provide for removal of such barriers, give 0.</p> <p>If the policy removes existing barriers, give 0.2.</p> <p>If none of the above, give 0.</p> <p>(Refer to information/description column to check applicability of this question)</p>	0.2	
5.b.2	Does the policy outline a clear strategy/provision to improve processes & procedures for assisting inventors & innovators in acquiring/filing/claiming Intellectual Property Rights (IPR)?	<p>Applicable only if 5.b.1 was applicable. If 5.b.1 is not applicable, mark 5.b.2 as not applicable as well</p>	<p>If yes, give 0.2. If no, give 0.</p>	0.2	

5.c Miscellaneous

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
5.c.1	Does the policy remove any existing distortion from markets that inhibits innovation?	Examples for distortions can include subsidies for fossil fuels or wind energy or solar	Applicable only if such distortions have been identified. If some such distortions exist and are removed by the policy, give 0.1 If all such distortions exist and are removed by the policy, give 0.2 instead	0.2	
5.c.2	Does the policy foster local entrepreneurship and local innovation?		If yes, give 0.2. If no, give 0.	0.2	
5.c.3	Does the policy advance development of curricula for higher education and vocational training to foster innovation and entrepreneurship?		If yes, give 0.2. If no, give 0.	0.2	
5.c.4	Does the policy remove barriers to grassroots innovation?	Grassroots innovation is referred to as the creation of innovative products, services or processes emerging from the bottom of the pyramid, often due to necessity and certain existing challenges.	If yes, give 0.2. If no, give 0.	0.2	
5.c.5	Does the policy measure the network of active incubators in the country?	Scorer is encouraged to check if provisions for this already exist and are mentioned elsewhere. If yes, mark positive	If yes, give 0.2. If no, give 0.	0.2	

Tabulation for metric 5: Entrepreneurship and Innovation

Tabulate the total points you have scored so far and the total number of points available to you (across sub-metrics 5.a to 5.c). Questions that are not applicable do not count against your points scored and available points.

Points Scored [PS5] : Available Points [AP5] :

Percentage Obtained: P5 = $(PS5/AP5 * 100)$

06

Environment and Sustainability

The interplay of science and technology with the environment is a crucial one, given the climatic predicament the planet finds itself in. Keeping this in mind, it is important to assess STI policies on their intent towards mitigating risks and ushering in resilience, with respect to the environment. This further includes the fostering of sustainable approaches to innovation and the application of emerging technologies to realise the goals of sustainability. This metric of the toolkit (i.e. sub-metrics 6.a and 6.b) not only assesses policies on environmental sustainability but also on the likely sustained benefits of the proposed interventions.

6.a Mitigating risks

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
6.a.1	Does the policy assess risk and resilience for science & technology in respect to the environment?	<p>This includes assessing potential damage to the environment.</p> <p>If answered yes, answer 6.a.2. Else mark 6.a.2 as 0 (do not treat as not applicable)</p>	If it assesses, give 0.2. But if it does not assess, give 0	0.2	
6.a.2	Does the policy offer steps to mitigate environmental damage which may arise in furtherance of actions taken under the policy?		If the policy provides steps to mitigate environmental damage, give 0.2. If no, give 0.	0.2	

6.b Sustainability

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
6.b.1	Does the policy provide initial evidence that the benefits of the proposed new interventions will/likely to have the future?	<p>Initial evidence refers to predicted data, past/similar examples or any other forms of evidence to showcase the likeliness of success of the interventions.</p> <p>Example: A proposed policy intervention is likely to have benefits for this country's STI ecosystem because it worked in a similar context elsewhere.</p>	If it assesses, give 0.2. But if it does not assess, give 0	0.2	
6.b.2	Does the policy address fostering sustainable approaches to innovation?		If yes, give 0.1. If no, give 0.	0.1	
6.b.3	Does the policy allow for creation of markets for innovative goods and services?	Scorer is advised to check for any restrictive interventions/policy aspects that may hinder creation of markets for innovative goods and services	If yes, give 0.1. If no, give 0.	0.1	
6.b.4	Does the policy advance development of formal education curricula to address sustainability related to STEM?	<p>Scorer is advised to check for</p> <ol style="list-style-type: none"> 1) Specific provisions advancing development of higher education and vocational training curricula considering sustainable development challenges 2) Provisions supporting learning, knowledge exchange and connections between current and potential actors in the sustainable innovation system 	If yes, give 0.2. If no, give 0.	0.2	

Tabulation for metric 6: Environment and Sustainability

Tabulate the total points you have scored so far and the total number of points available to you (across sub-metrics 6.a and 6.b). Questions that are not applicable do not count against your points scored and available points.

Points Scored [PS6] : Available Points [AP6] :

Percentage Obtained: P6 = $(PS6/AP6 * 100)$

07

Investment

A robust investment strategy and the associated roadmap to achieve its corresponding goals are key for policies to deliver desired outcomes. In the science & technology policy landscape, this also includes but is not limited to appropriate strategies for research and development expenditure, enabling a conducive environment for stakeholder engagement, and removing barriers to foreign investment in science and technology. Questions listed below under each sub-metric (7.a to 7.c) assess the S&T policy on areas related to investment and expenditure.

7.a Investment strategy

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
7.a.1	Does the policy have a clearly outlined R&D investment strategy?		If yes, give 0.2. If no, give 0.	0.2	
7.a.2	Does the policy provide suitable reasoning for increasing expenditure in specific areas of R&D in S&T?	To check applicability of the question: a) If 7.a.1 is answered as no, mark 7.a.2 as not applicable. Else if 7.a.1 is answered as yes, move to point b) b) If the policy has outlined specific areas/sectors/projects to increase expenditure in, then the question should be applicable. Otherwise, mark as not applicable	If suitable reasoning is given for increasing expenditure in certain specific areas, give 0.2. If suitable reasoning has not been provided, give 0.	0.2	
7.a.3	Are sources of funding for programmatic interventions identified in the policy?	Scorer is required to also check allied documents for information on sources of funding for programmatic interventions (Examples of programmatic interventions can include: Setting up of a new entity or starting a new scheme)	If the policy does not propose any new programmatic interventions, the question should be considered NA. If sources of funding are outlined, give 0.2. If not, give 0.	0.2	

7.b Expenditure by stakeholders

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
7.b.1	Does the policy recognise the link between research & the private sector?		If it recognises links between research & private sector, give 0.1. If not, give 0	0.1	
7.b.2	Does the policy outline a strategy for enhancing participation by private sector in R&D?	Scorer is required to check share of private sector in R&D expenditure to assess applicability	<p>If 7.b.1 is answered no, give 0 for this question as well. If 7.b.1 is answered yes, assess applicability of this question:</p> <p>If the private sector of the country already has a major share of R&D expenditure as part of the total R&D expenditure of the country, this question will be not applicable (NA).</p> <p>If this question is applicable, and the policy outlines a strategy, give 0.1.</p> <p>If this question is applicable but no strategy has been outlined, give 0.</p>	0.1	
7.b.3	Does the policy recognise the link between research & education?	(If answered yes, answer 7.b.4. If answered no, mark 7.b.4 as 0 (do not treat as not applicable))	If it recognises the link between research & education, give 0.1. If not, give 0.	0.1	
7.b.4	Does the policy outline ways of enhancing performance of R&D by higher education sector?		<p>If 7.b.3 is answered no, give 0 for this question as well. If 7.b.3 is answered yes, mark as per the following:</p> <p>If the policy outlines a strategy for enhancing R&D performance by the higher education sector, give 0.1. If no, give 0.</p>	0.1	

7.c Removing barriers to investment

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
7.c.1	Does the policy remove any existing regulatory barriers restricting the autonomy of publicly funded institutions from raising funds from sources other than the government?	<p>Scorer is advised to check for:</p> <p>1) Barriers to raising funds from private entities/sources</p> <p>2) Barriers to raising funds from foreign sources</p> <p>If either of these barriers exist, question is to be treated as applicable</p>	<p>If regulatory barriers exist and are being reduced/ removed by the policy, give 0.2.</p> <p>If regulatory barriers exist and the policy adds barriers/does not remove existing barriers give 0.</p> <p>If the policy neither adds barriers nor do barriers currently exist - question to be treated as NA.</p>	0.2	
7.c.2	Does the policy remove any existing barriers to foreign investment into R&D?	<p>Scorer is advised to check:</p> <p>a) The foreign direct investment policy/related laws.</p> <p>b) UNCTAD data on FDI inflow into R&D across countries.</p> <p>Limitation: All countries do not report this data</p>	<p>If the policy provisions impede foreign investment in R&D, give 0. If not, check for existing barriers to foreign investment. If no barriers exist - mark the question as NA.</p> <p>If the policy identifies existing barriers but does not outline a strategy to remove them, give 0.</p> <p>If the policy identifies existing barriers and outlines a strategy to remove these barriers, give 0.2.</p>	0.2	

Tabulation for metric 7: Investment

Tabulate the total points you have scored so far and the total number of points available to you (across sub-metrics 7.a to 7.c). Questions that are not applicable do not count against your points scored and available points.

Points Scored [PS7] : Available Points [AP7] :

Percentage Obtained: P7 = $(PS7/AP7 * 100)$

08

Other key considerations

Besides the vision of a policy with regards to the above metrics, it is vital to evaluate it on certain other parameters, such as the policy being reflective of learnings from previous policies, whether it provisions for a sunset clause or periodic review, whether it takes any conflicts of interest into account, and so on. Questions listed below under each sub-metric (8.a to 8.e) assess the S&T policy on key considerations, other than the ones covered in the previous seven metrics.

8.a Sunset provision

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
8.a.1	Has a sunset provision or sunset clause been provided in the policy?	A sunset clause/provision in this context is referred to as the specification of a date after which the policy shall cease to be applicable, unless further extension of it is notified. The existence of a specified time period for which the policy has been created/will be applicable or a periodic review is also to be treated synonymous to a sunset clause/provision.	If yes, give 0.4. If no, give 0.	0.4	

8.b Learnings from previous policies

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
8b.1	Is the policy reflective of/takes into consideration the previous policy, its objectives and lessons from it?	Applicable only if a previous policy, guideline or planning document exists.	Yes 1, No 0, Moderately/to only a certain extent 0.5.	1	

8.c Clear of conflict of interest

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
8c.1	Is the policy clear of any conflict of interest?	Example: The responsibility of policymaking and the responsibility of assessment of the policy being allocated to the same committee/ set of individuals.	Yes 0.6, No 0, Moderately/to only a certain extent 0.2	0.6	

8.d Issue identification

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
8c.1	Does the policy identify key issues in the S&T ecosystem of the country and outline ways of resolving them?	Example: Key issues identified by the policy might include poor quality of research, lack of research-oriented universities, lack of investment in R&D, etc.	<p>If no key issues have been highlighted, give 0</p> <p>If key issues have been identified, mark as per the following:</p> <p>a) If strategy for resolving the issues has not been outlined, give 0.1</p> <p>b) If key issues have been identified and strategy for resolving them has been outlined:</p> <ul style="list-style-type: none"> • for all identified issues, then give 0.8 • for most identified issues, then give 0.6 • for at least one issue, then give 0.2. 	0.8	

8.e No conflict with other key policies³

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
8.e.1	Is the S&T policy in conflict with the Education Policy of the country?	In case of non-existence of a separate policy documents AND/OR if the time period between the release of the S&T policy and the release of the Education Policy's latest draft is more than 5 years, do not assess conflict and mark the question as not applicable (NA).	Give a score of 0.2 for no conflict identified with the Education Policy. Give 0 in case of conflict with the Education Policy. <i>Refer to the information section to check for the applicability of the question.</i>	0.2	
8.e.2	Is the S&T policy in conflict with the Industry/Commerce Policy of the country?	In case of non-existence of a separate policy documents AND/OR if the time period between the release of the S&T policy and the release of the Industry/Commerce Policy's latest draft is more than 5 years, do not assess conflict and mark the question as not applicable (NA).	Give a score of 0.2 for no conflict identified with the Industry/Commerce Policy. Give 0 in case of conflict with the Industry/Commerce Policy. <i>Refer to the information section to check for the applicability of the question.</i>	0.2	

3. This sub-metric only assesses conflict with five key policy documents. For a more in-depth assessment, the scorer may consider the following policies to also be reviewed (nomenclature may differ depending on the country): Sector/Domain-specific technology policies of IPR, Telecommunications, Broadcasting, Health, Water & Sanitation, Defence, Rural and Urban Development, Environment, Animal Husbandry, Farming, Power & Energy, Infrastructure, Labour & Employment, Drones, Foreign Affairs, etc.

S. No.	Question	Information/Description	Scoring Guideline	Maximum Score, if all parts are applicable	Points Scored
8.e.3	Is the S&T policy in conflict with the Startup/Innovation/Entrepreneurship Policy of the country?	In case of non-existence of a separate policy documents AND/OR if the time period between the release of the S&T policy and the release of the Startup/Innovation/Entrepreneurship Policy's latest draft is more than 5 years, do not assess conflict and mark the question as not applicable (NA).	Give a score of 0.2 for no conflict identified with the Startup/Innovation/Entrepreneurship Policy. Give 0 in case of conflict with the Startup/Innovation/Entrepreneurship Policy. <i>Refer to the information section to check for the applicability of the question.</i>	0.2	
8.e.4	Is the S&T policy in conflict with the Research Policy of the country?	In case of non-existence of a separate policy documents AND/OR if the time period between the release of the S&T policy and the release of the Research Policy's latest draft is more than 5 years, do not assess conflict and mark the question as not applicable (NA).	Give a score of 0.2 for no conflict identified with the Research Policy. Give 0 in case of conflict with the Research Policy. <i>Refer to the information section to check for the applicability of the question.</i>	0.2	
8.e.5	Is the S&T policy in conflict with the latest National Budget or National Budget following the release of the policy?	Scorer is advised to keep in mind that budgetary processes, nomenclatures and budget drafting agencies differ across countries. Check the latest National Budget for a newly released policy or the National Budget that followed the release of the policy at the time for the assessment.	Give a score of 0.2 for no conflict identified with the Budget. Give 0 in case of conflict with the Budget.	0.2	

Tabulation for metric 8: Other key considerations

Tabulate the total points you have scored so far and the total number of points available to you (across sub-metrics 8.a to 8.e). Questions that are not applicable do not count against your points scored and available points.

Points Scored [PS8] : **Available Points [AP8]** :

Percentage Obtained: P8 = (PS8/AP8 * 100)

Tabulation For Grand Total

Use the table below to calculate the sum of weighted percentage points which will be equal to the overall score of the policy on a scale of 100.

Metric	Percentages Obtained (P1, P2...)		Weights	P1 * Assigned Weight = Weighted Percentage Points
Transparency	P1		20%	
Accountability & Administration	P2		20%	
Inclusion	P3		8%	
Collaboration, Resources and Research	P4		10%	
Entrepreneurship & Innovation	P5		10%	
Environment and Sustainability	P6		10%	
Investment	P7		8%	
Other key considerations	P8		14%	
TOTAL			100%	Sum of weighted percentage points =

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interest
 property toolkits suited **toolkit** ethics
 in-depth **assessment** considerations
 sustainability **science** intellectual
 need **technology** bias **policy** architecture
 provide **collaboration** metrics **evaluation** specific
 available clarity **establish** attempt
 cross-cutting **resources** environment **entrepreneurship** consultations
 institutional **gap** **transparency** quality **policies** policymaking
 reducing **assess** **whereas** **accountability** view
 investment **frameworks** **outcomes** **impact** **research** **evaluate** feedback
holistically **inclusion** **effectiveness** **administration** guideline **conflict**
evident **process** **innovation** **aims** **point**
holistic **country** **policymakers**