Impact assessment of FOR Studies and Capacity Building Programmes

Final Report

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pwc

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List of abbreviations

Abbreviation	Full Form
AT&C	Aggregate Transmission and Commercial
CBP	Capacity Building Programme
CGRF	Consumer Grievance Redressal Forum
DFID	Department for International Development
DSM	Demand-side management
ECG	Evaluation Cooperation Group
FOR	Forum of Regulators
OECD – DAC	Organisation for Economic Co-operation and Development – Development Assistance Committee
PwC	PricewaterhouseCoopers Pvt. Ltd
SERC	State Electricity Regulatory Commission
TIMM	Total Impact Measurement and Management

Executive Summary

In discharge of its functioning, the Forum of Regulators (FOR) conducts Studies and Capacity Building Programmes (CBPs) for State Electricity Regulatory Commissions (SERCs) on priority domains in the power sector to aid SERCs in enhancing knowledge on pertinent issues, benchmarking themselves against national and international frameworks, and developing roadmaps for future implementation. FOR has organized 5 CBPs during the past 5 years (2013-2017) which have focused on new sector areas of renewable energy, demand side management, energy efficiency, as well as prevailing domains of technical performance improvement, tariff reforms, and functioning of CGRF and Ombudsman. Besides organizing the CBPs, the FOR has conducted 20 studies during the past 5 years, conducted on a number of salient issues including performance assessment of distribution utilities, reduction in technical and commercial losses, competition in retail supply, supporting community-level off-grid projects, functioning of CGRF and Ombudsman, and promotion of renewable energy.

FOR had decided to carry out an independent Impact Assessment of the Studies and Capacity building workshops undertaken during the past 5 years and analyze whether these activities are in line with the functions and objectives of the Forum. PricewaterhouseCoopers Pvt. Ltd. (PwC) was appointed by FOR to assist in carrying out the tasks required for the study.

Approach for this assignment

The execution of this assignment was divided under five main stages: **Inception - Design and Planning, Finalization of Key Impact Parameters, Data Collection and Analysis, Framing Recommendations and Roadmap, and Stakeholder Consultation.**

Phase 1: Design and Planning of Study

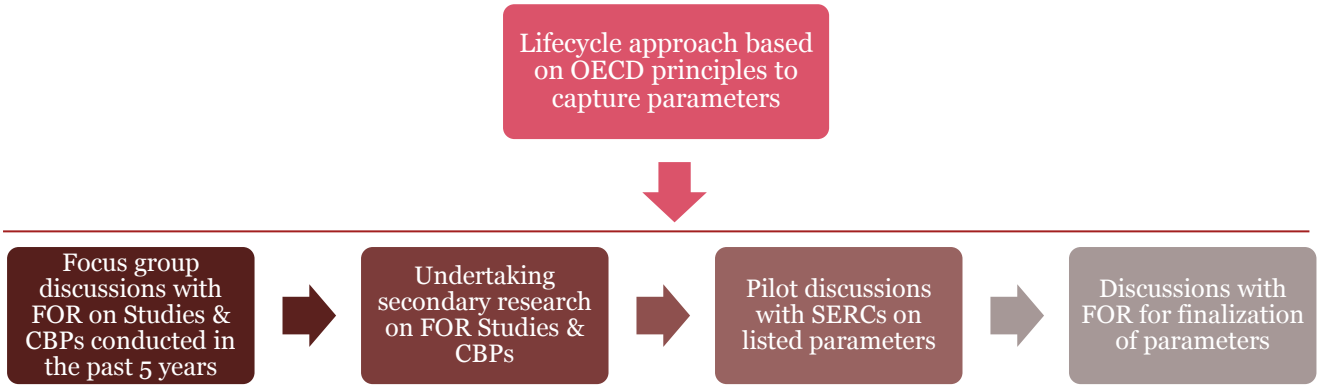
A literature review of best practices in impact assessment both in India as well as in the global context has been undertaken to provide a reference point for framing a new approach for this study. A number of key frameworks designed by global bodies such as OECD – DAC (Development Assistance Committee), Evaluation Cooperation Group and the Department of International Development (DFID) were studied to understand the evolution of impact assessment techniques over the years, as well as their suitability to the context of this study. Impact assessment studies in India were also examined to establish major evaluation methods currently used in India and the advantages they offer in the context of this study.

A suitable approach of OECD – DAC Quality Standards for Development Evaluation was chosen to design the impact assessment framework for this study, since it allows a comprehensive understanding of all parameters across the lifecycle of a study, provides substantial focus on impact and sustainability of study findings and enables the development of a future action plan.

Since a large number of studies (20) have been conducted in the past 5 years from FY 12 to FY 17, categorization of studies has been done on the basis of domain/knowledge area so that a more focused assessment of the impact of each of the domains can be evaluated. The 5 groups thus formed are: Commercial Studies, Technical Studies, Consumer Studies, Renewable, DSM and Efficiency Studies, and Other Sector Studies. Similarly, each of the 5 CBPs conducted in the past 5 years has been evaluated separately for focussed assessment of each.

Phase 2: Finalization of Key Impact Parameters

To ensure that all relevant parameters and concerns are captured and clearly delineated for designing of surveys, a lifecycle approach was adopted based on OECD-DAC principles to guide discussions with stakeholders, and all parameters were captured under the given framework.



Accordingly, the following parameters were formalized under the OECD – DAC framework for assessing impact of FOR Studies and CBPs. In addition to the finalized parameters, an overall parameter was also included so that the overall perception of each Evaluation Criteria is evaluated.

Table 1: Parameters for Studies

Relevance	Efficiency	Effectiveness	Impact	Sustainability
Relevance of Topics	Time Allocation to Studies	Involvement for Content	Increase in Awareness	Requirement of FOR Interventions
Involvement for Topics	Timely Communication from FOR	SERCs Review of Studies	Enhancing Global View	Withstanding future challenges
Relevance to SERC Issues	Overall Efficiency	Including Stakeholder Concerns	Enhancing National View	Overall Sustainability
Consideration of Resources		Quality of Analysis, Quality of Research	Contribution to Regulations	
Relevance to SERC Challenges		Feasibility of Study	Contribution to Issue Resolution	
Overall Relevance		State Suitability	Overall Impact	
		Cost Effectiveness, Technology		
		Report Structure & Clarity		
		Including International Cases		
		Including National Cases		
		Overall Effectiveness		

Table 2: Parameters for CBPs

Relevance	Efficiency	Effectiveness	Impact	Sustainability
Relevance of Topics	Quality of CBP arrangement	SERCs Involvement	Increase in Awareness	Requirement of FOR Interventions
Involvement for Topics	Structuring and Scheduling	Stakeholder Concerns	Enhancing Global View	Withstanding future challenges
Relevance to SERC Issues	Suitability of attendees	Content Coverage	Enhancing National View	Overall Sustainability
Consideration of Resources	Suitability of speakers	Feasibility of Recommendations	Contribution to Regulations	
Relevance to SERC Challenges	Adequate prior information	State Suitability of Recommendations	Contribution to Issue Resolution	
Overall Relevance	Quality of training material	Cost effectiveness	Overall Impact	
	Partner Performance	Technology Incorporation		
	Overall Efficiency	Quality of Presentations		

Relevance	Efficiency	Effectiveness	Impact	Sustainability
		Time for Discussions		
		Including National Cases		
		Overall Effectiveness		

5 sets of surveys were thus designed for Studies in line with 5 types of studies, and 5 sets for CBPs in line with 5 CBPs conducted in the past 5 years, sent to all SERCs for providing due feedback.

Phase 3: Data Collection - Profile of responses

A total of 103 responses were received for Studies conducted by FOR from 33 respondents across 19 SERCs. A summary of the profile of responses is given below, while the complete list of respondents is provided in Annexure 1.1.

Figure 1: Profile of Respondents – Studies

Total Number of Respondents: 33

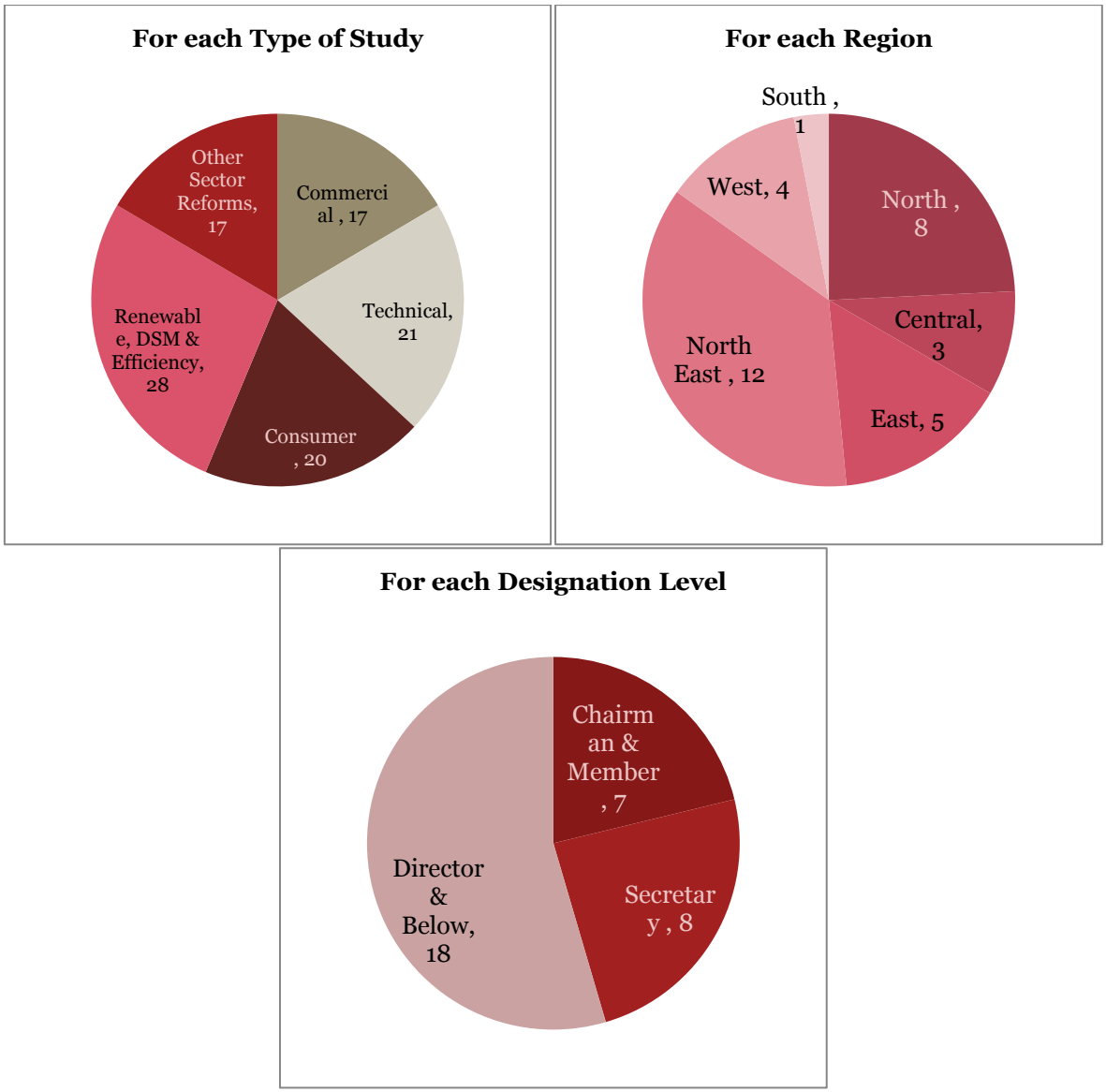
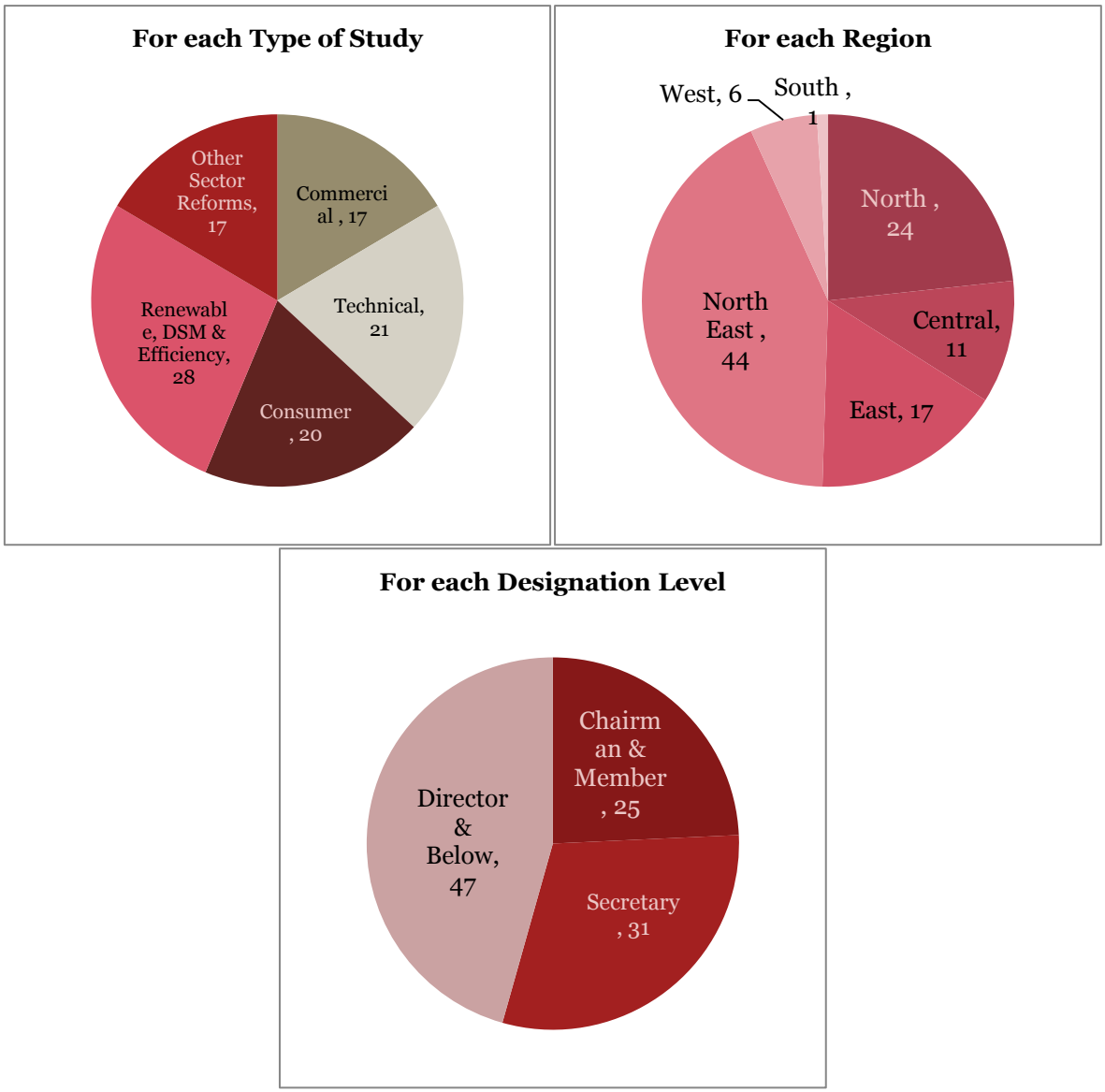


Figure 2: Profile of Responses – Studies

Total Number of Responses: 103



An acceptable base of responses was thus recorded for Studies, enabling a comprehensive analysis of the responses across the length of a study lifecycle.

A total of 15 responses were received for CBPs conducted by FOR from 14 respondents across 12 SERCs. A summary of the profile of responses is given below, while the complete list of respondents is provided in Annexure 1.2.

Figure 3: Profile of Respondents – CBPs

Total Number of Responses: 14

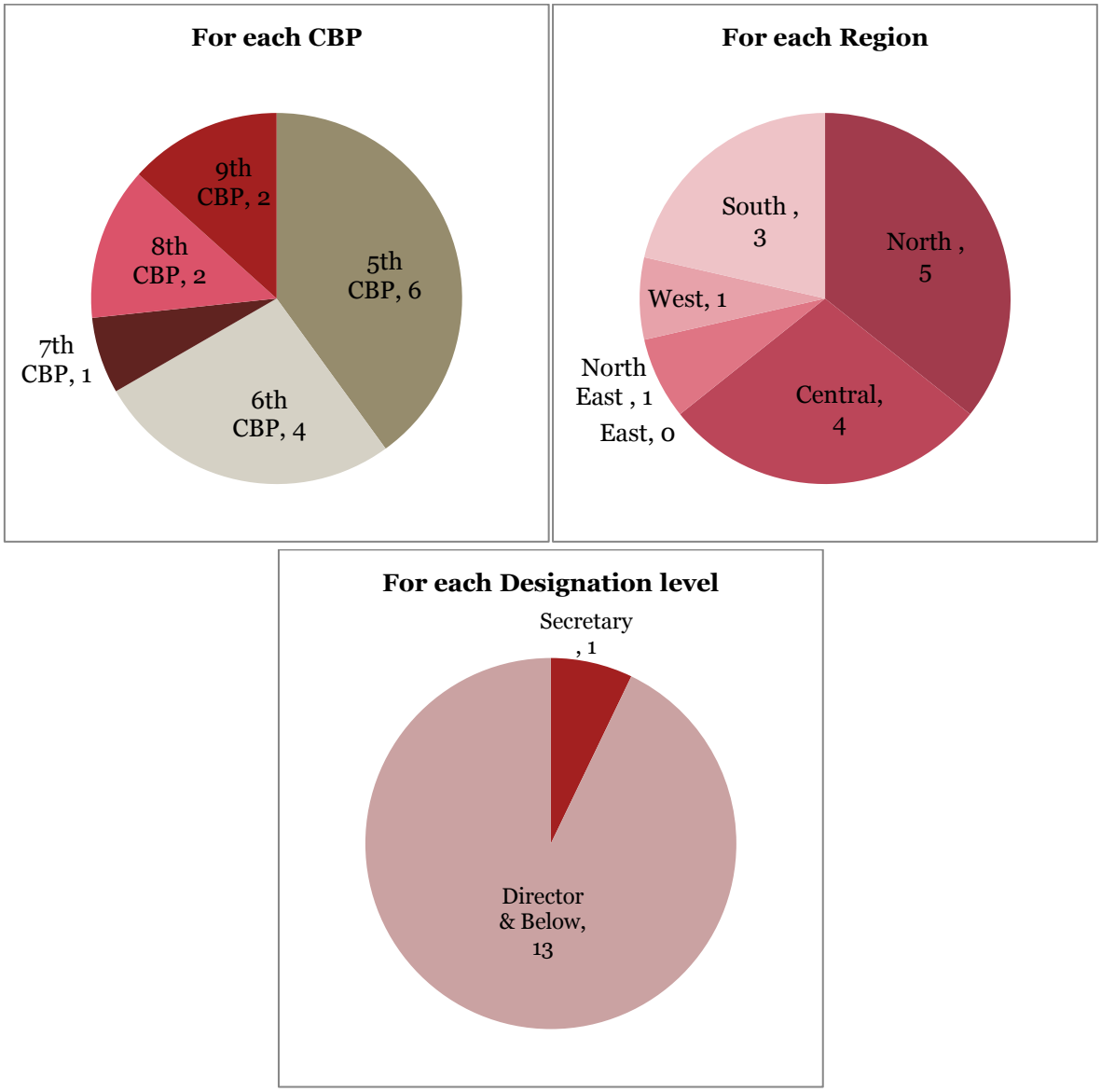
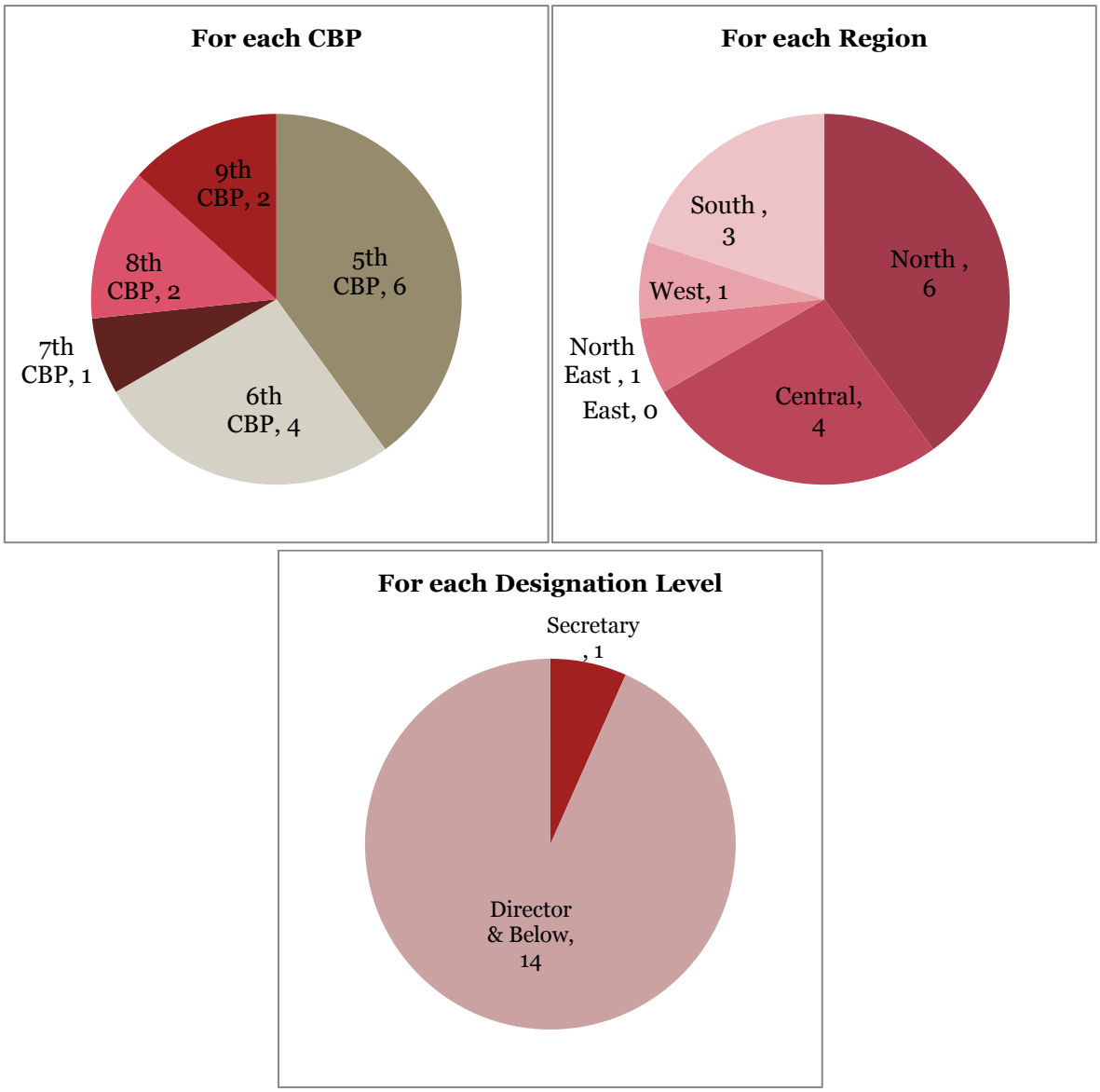


Figure 4: Profile of Responses – CBPs

Total Number of Responses: 15



The number of responses received for CBPs was relatively lesser than that of the Studies. The absence of many previous participants of CBPs and a general lack of recall amongst respondents regarding conduct and execution of CBPs contributed to the lower number of responses for CBPs. However, the feedback forms filled at the time of CBPs have aided the development of insights for CBPs.

Phase 3: Analysis of responses from SERCs

To derive suitable insights from survey responses, two types of tactics were followed: first, to analyze the ratings of all parameters comprehensively across the lifecycle of CBPs to assess the respondents' satisfaction with all aspects, and second, to identify the most critical parameters responsible for making CBPs more successful and impactful. The given tactics were thus executed with the aid of two types of analysis: Ratings analysis and Statistical Analysis, as depicted below:

Table 3: Types of analysis

Rating Analysis – how all parameters fared across Study/CBP lifecycle		
Ratings of evaluation criteria (Relevance, Efficiency, Effectiveness, Impact, Sustainability)	Summary of parameter ratings (less than 3, between 3 & 3.5, greater than 3.5)	Overall mapping of Quality of Studies/CBPs V Impact of Studies/CBPs
Statistical Analysis – which parameters were perceived to be most critical and influential		
Regression Analysis: Determining the most significant parameters	**Factor Analysis:** Discovering new groups of parameters - Principal Components	**Discriminant Analysis:** Determining the most differentiating parameters

Cross Sectional Analysis:

- ***Type of Study*** *(Technical, Commercial, Consumer, Renewable, DSM & Efficiency, Others)*
- ***Designation Level*** *(Chairman, Member, Secretary, Directors & below)*
- ***Region*** *(North, Central, East, North East, South, West)*

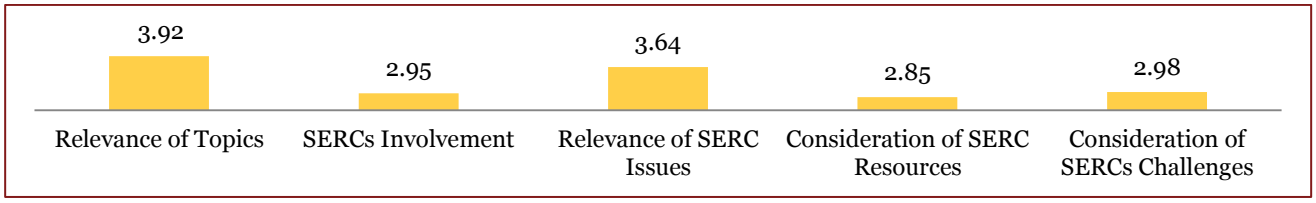
For each tactic, cross-sectional analysis was also undertaken for 3 types of cross sections – Type of Study, Designation Level, and Region, to better understand the variation in responses from the different sets of respondents.

The given analysis has been presented first for Studies, and then for CBPs, as elaborated in the following section.

Ratings Analysis - Studies

Average ratings of overall parameters for each Evaluation Criteria have been provided below. The ratings were given by respondents on a scale of 5.

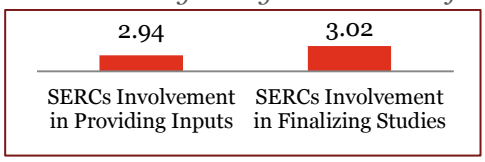
Relevance (Overall Rating – 3.71)



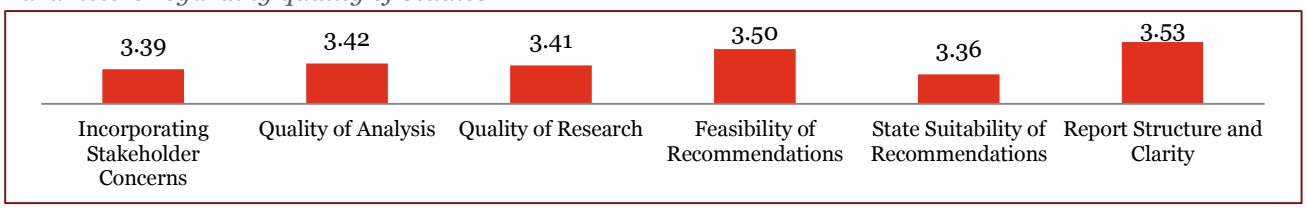
Efficiency (Overall Rating – 3.55)

Effectiveness (Overall Rating – 3.51)

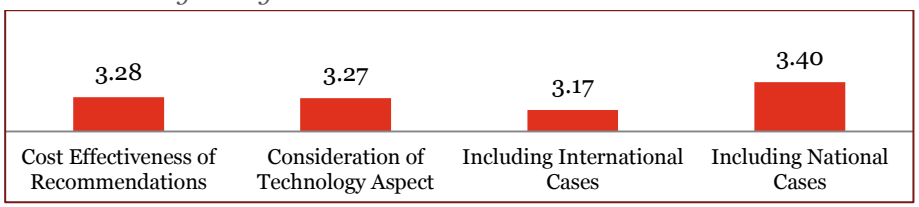
Parameters regarding involvement of SERCs



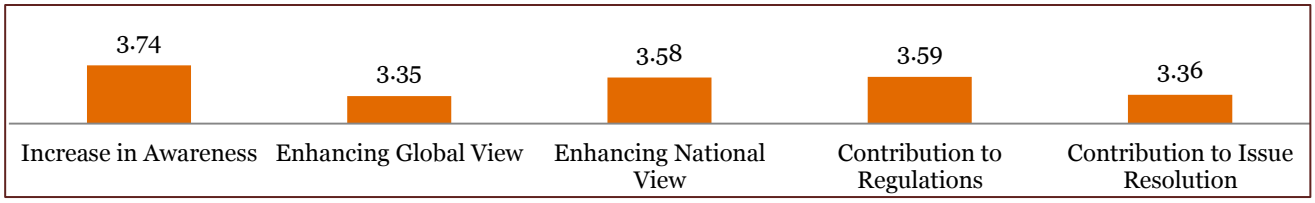
Parameters regarding quality of Studies



Parameters regarding value add to Studies



Impact (Overall Rating – 3.50)



Sustainability (Overall Rating – 3.52)

Following observations were made for each Evaluation Criteria:

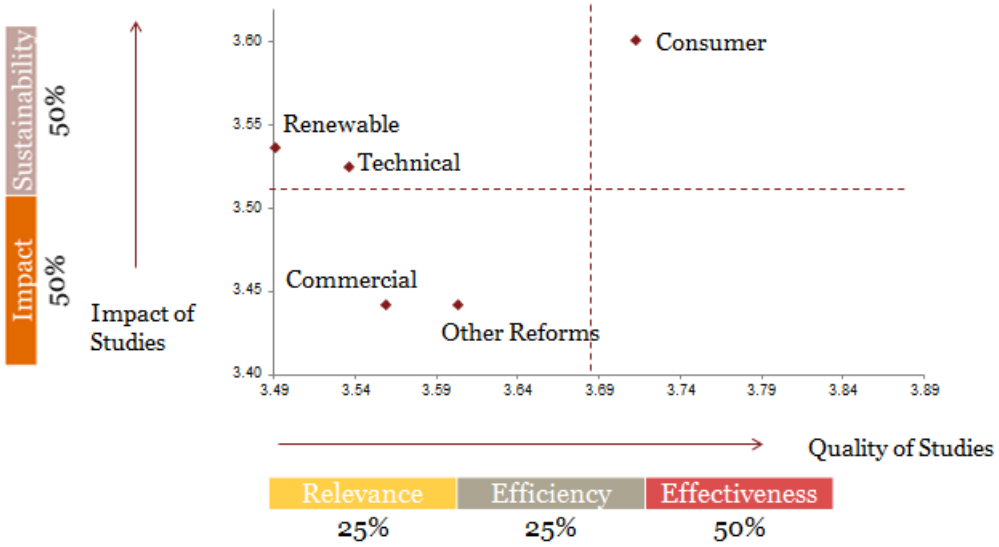
1. **Relevance:** While the relevance of topics and their relation to current issues has been rated relatively higher than average, the involvement and consideration of SERCs in the planning stages of Studies has been rated below average.
   Cross-sectional analysis also revealed that Directors & below perceive greater relevance of Studies and more involvement of SERCs as compared to designation levels of Chairman, Member and Secretary. Central and North-Eastern regions perceive lesser involvement in the planning stages of SERCs in comparison to other regions.
2. **Efficiency:** Both parameters have been rated above average, indicating the overall satisfaction of SERCs with the efficiency in conduct of Studies undertaken by FOR.
   Cross-sectional analysis has revealed that Chairmen & Members are more satisfied with efficient conduct of Studies than other designation levels. Respondents from Central and North-Eastern states seem to be less satisfied with Timely Communication from FOR for seeking of feedback and inputs, while other regions are reasonably satisfied.

3. **Effectiveness:** Most parameters have been rated average or marginally below average (in particular, value add parameters like cost effectiveness of recommendations, incorporation of technology aspect, and inclusion of international cases), indicating scope of improvement in the overall quality of Studies. The parameter of Report Structure and Clarity has been rated the highest of all Effectiveness parameters. However, similar to Relevance Criteria, the involvement of SERCs in providing inputs for Studies continues to be a concern and has been rated lower.
   Cross-sectional analysis has revealed that further incorporation of technology aspect is desired for Technical and Renewable studies. Secretaries of SERCs have given a relatively higher rating to all parameters contributing to quality and comprehensiveness of Studies, but are less satisfied with their involvement in execution stage of Studies in comparison to other Designation Levels.
4. **Impact:** While Impact parameters for creating awareness, providing national perspective and contributing to framing of regulations have been rated higher than average, other Impact parameters for providing global perspective and contribution to resolution of actual issues have been marginally below average.
   Cross-sectional analysis has revealed that Secretaries and Directors & below have rated Impact parameters higher than Chairman & Member, indicating that they have perceived greater influence of Studies on SERC functions and outputs. Overall, Secretaries and Directors & below perceive that Studies have been more impactful than Chairman & Members.

5. **Sustainability:** SERCs have rated the ability of Studies to withstand future challenges higher than average, while indicating that moderate support will be required for certain types of Studies from FOR.
   Cross-sectional analysis has revealed that more support and interventions have been sought by SERCs for implementation of Renewable Studies in comparison to other types of Studies. Secretary, Directors & below seek more support from FOR for implementation of Studies in comparison to Chairman & Members.

To understand where each type of Study stands on the aspect of quality and depth of Study report (Quality of Studies), as well as how useful and impactful they have proved to be in aiding SERC functions (Impact of Studies), the following mapping was developed.

Figure 5: Mapping of Impact of Studies and Quality of Studies



As observed, Consumer Studies lie higher on both Quality as well as Impact scale, indicating that Studies perceived to be of high quality have also gained a favourable perception for greater Impact on SERCs.

As also observed, Commercial and Other Sector Studies lie lower on the Impact scale and may be improved for greater impact in the future, while Renewable, Technical and Commercial Studies lie lower on the Quality scale and may be improved for greater depth and coverage of content in the future.

Statistical Analysis – Studies

Regression analysis was undertaken to identify the most significant parameters under each Evaluation Criteria which contributed to the overall rating for that Criteria. This enabled the shortlisting of parameters that respondents perceive most critical for the success of each Evaluation Criteria, as produced in the following table.

Table 4: Regression analysis - Most significant parameters

Evaluation Criteria	Parameter	Beta Value	Significance Value	Corresponding question asked in Survey
Relevance	Relevance of study topics	0.350	0.000	Were the topics of the Studies relevant to the functions of the SERC?
	Relevance to SERC Issues	0.457	0.000	Were the topics of the Studies relevant to the crucial issues/challenges being faced by the SERC?
Efficiency	Timely communication from FOR Secretariat	0.422	0.000	Did FOR Secretariat communicate/seek inputs and feedback from the SERC for the execution of the Studies in a timely manner?
	Time Allocation to Studies	0.570	0.000	Was the time allocated to the execution of the Studies adequate?
Effectiveness	Quality of Research	0.149	0.169	How would you rate the quality of research methodology adopted in the Studies?
	Quality of Analysis	0.344	0.002	How would you rate the quality of analysis and insights in the Studies?
	Including National Cases	0.276	0.008	How would rate the incorporation of national and state-specific case studies in highlighting prevalent issues in the Studies?
	Feasibility of Recommendations	0.160	0.084	Were the Studies' recommendations feasible for implementation?
Impact	Increase in Awareness	0.328	0.002	Did the Studies contribute in creating awareness and enhancing the knowledge base of SERC members?
	Enhancing Global View	0.201	0.020	Did the Studies contribute in providing a global viewpoint of the issues addressed?
	Contribution to Issue Resolution	0.270	0.007	Did the Studies contribute to actual resolution of prevalent issues in the state?
Sustainability	Withstanding future challenges	0.931	0.000	Can the recommendations of the Studies withstand practical challenges in the future?

The given parameters influence the rating of each Evaluation Criteria the most, and therefore hold most significance for the SERCs. Therefore, each of these parameters needs to be scrutinized for satisfactory conduct of each Study.

Factor Analysis (Principal Components) was also undertaken to identify new groups of parameters as per the proximity/similarity of response trends. The major groupings observed from the analysis were:

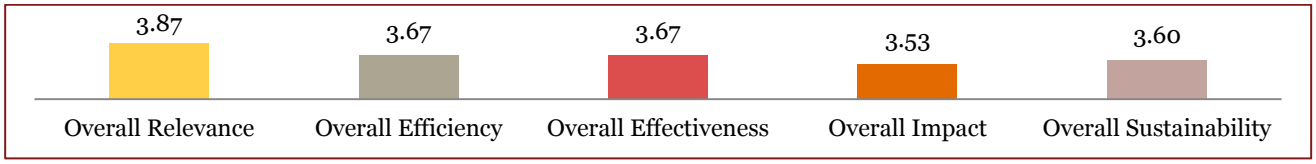
SERC Involvement and Consideration	Alignment of Studies with SERC functions	Quality and Comprehensiveness of Studies	Applicability of Studies	Value Addition (Technology, Global Perspective, etc.)

The given groups thus outline the overarching parameters which are responsible for the overall perception of Studies. Such overarching parameters should be kept in mind while developing and evaluating new Studies to ensure suitable adoption by SERCs.

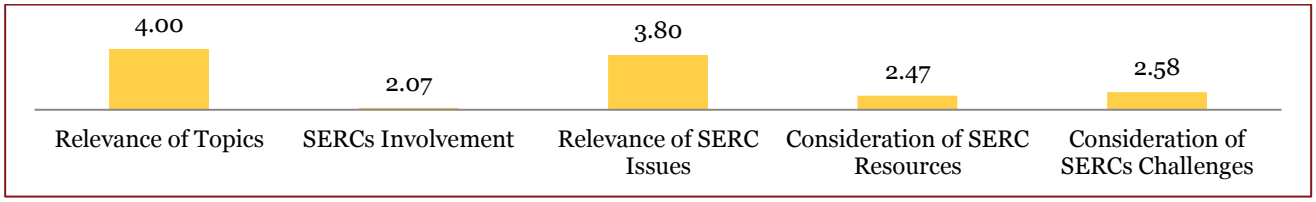
Discriminant Analysis has also been undertaken to identify parameters that most differentiate/ discriminate between the sets of respondents who have given different ratings for Impact and Sustainability. It was found that *parameters under Effectiveness and Impact criteria which contribute to quality of studies* are most discriminating in rating of Overall Impact of Studies, while parameters under *Effectiveness and Impact criteria which are responsible for key outputs (formulation of regulations and resolution of issues)* are most discriminating in rating of Overall Sustainability of Studies.

Ratings Analysis – CBPs

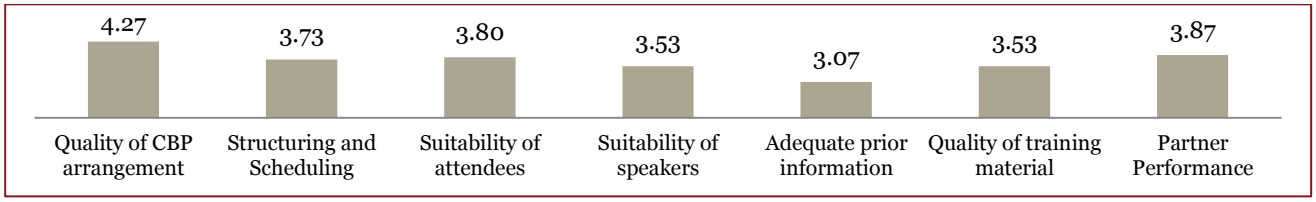
Average ratings of parameters for overall assessment as well as other parameters have been provided below.



Relevance (Overall Rating – 3.87)

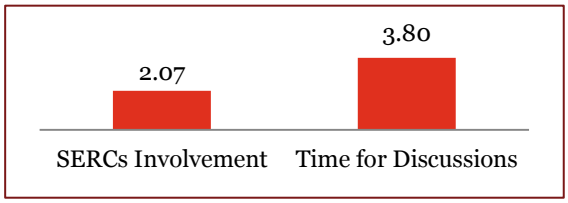


Efficiency (Overall Rating – 3.67)

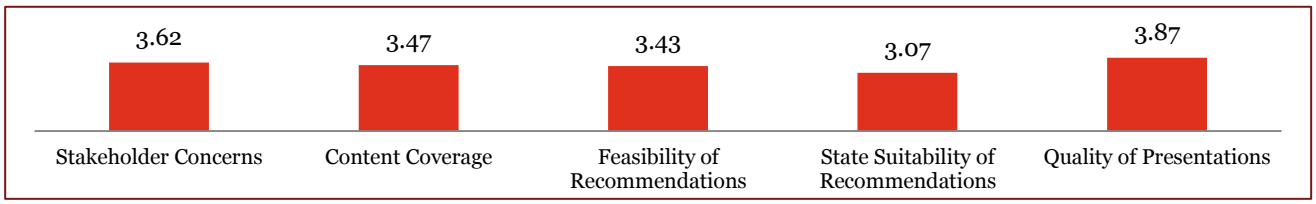


Effectiveness (Overall Rating – 3.67)

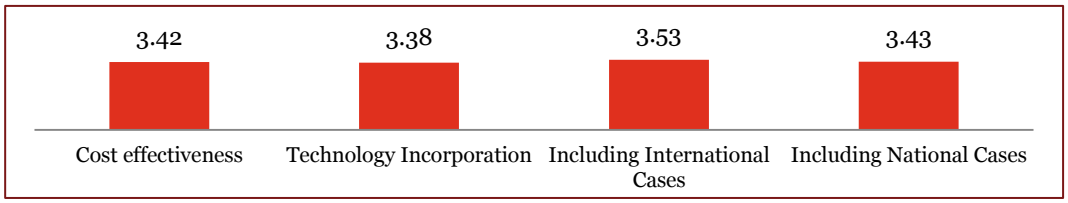
Involvement of SERCs



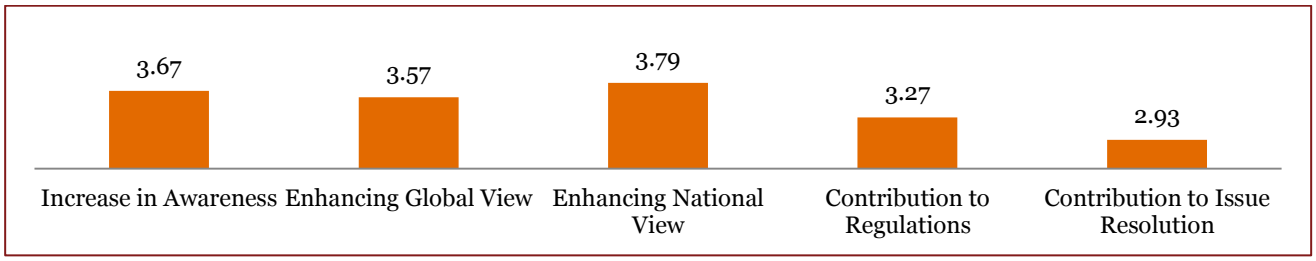
Quality of CBPs



Value add to CBPs



Impact (Overall Rating – 3.53)



Sustainability (Overall Rating – 3.60)

Following observations were made for each Evaluation Criteria:

1. **Relevance:** While the relevance of topics and their relation to current issues has been rated relatively higher than average, the involvement and consideration of SERCs in the planning stages of Studies has been rated much lower than average.
   Analysis for each CBP has revealed that the concern over SERC involvement in determination of CBP topics has remained consistent over the CBPs held in the past 5 years, though other Relevance parameters have shown marginal improvement from 8th to 9th CBP.

2. **Efficiency:** Most parameters have been rated higher than average, indicating the satisfaction of SERCs with the efficiency in conduct of CBPs undertaken by FOR, with the only concern as sharing of prior information about CBPs.
   Analysis for each CBP has revealed that parameter corresponding to sharing of prior information before CBPs was rated relatively lower across all CBPs. However, CBP arrangements and structuring have been perceived to improve steadily, and in particular from 8th to 9th CBP.

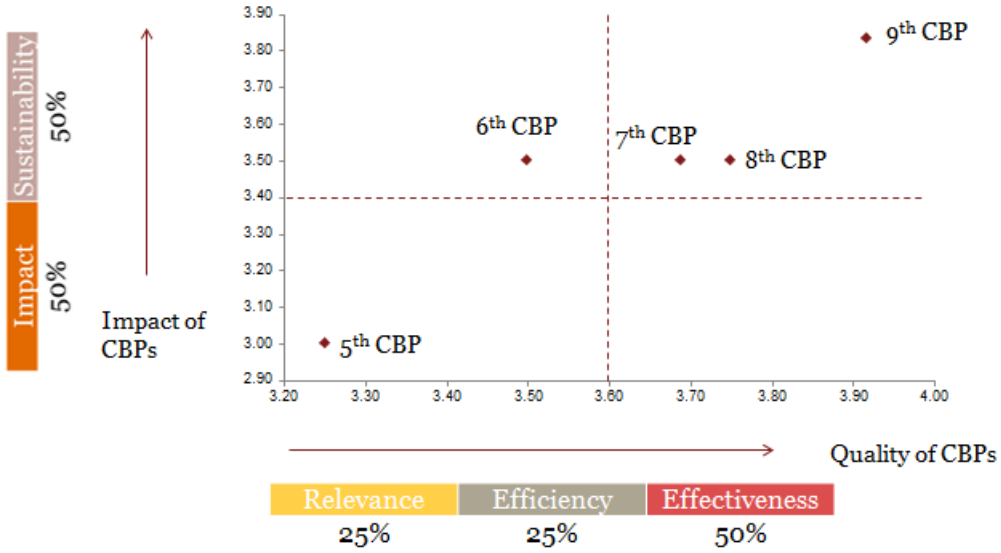
3. **Effectiveness:** Most parameters have been rated average or below average, indicating scope of improvement for quality of CBP delivery and material. Similar to Relevance Criteria, the involvement of SERCs in providing inputs for CBPs continues to be a concern and has been rated much lower than average.

Analysis for each CBP has revealed that the ratings of value add parameters (state suitability and cost effectiveness of recommendations, technology incorporation) are relatively lower across the CBPs and suggest scope of improvement.

4. **Impact:** While Impact parameters for creating awareness and providing national and international perspective have been rated marginally higher than average, other Impact parameters for contribution to regulations and contribution to resolution of actual issues have been rated below average. *Analysis for each CBP* has revealed that 8th and 9th CBP have been rated higher on the role of CBPs in increasing awareness about relevant issues. However, lack of follow up impact of CBPs has been felt across CBPs held in the past 5 years, evident in the relatively lower ratings of the parameters Contribution to Regulations and Contribution to Issue Resolution.
5. **Sustainability:** SERCs have rated the ability of CBPs to withstand future challenges marginally below average, while indicating that moderate support will be required for certain types of CBPs from FOR. *Analysis for each CBP* has revealed that both parameters under the Sustainability criteria have shown improvement from 8th to 9th CBP.

To understand where each CBP stands on the aspect of quality and delivery of CBP (Quality of CBPs), as well as how useful and impactful they have proved to be in aiding SERC functions (Impact of CBPs), the following mapping was developed.

Figure 6: Mapping of Quality of CBPs and Impact of CBPs



As observed, the Quality of CBPs has improved gradually over time, though the Impact of CBPs has been perceived to improve more recently (from 8th to 9th CBP).

Statistical Analysis – CBPs

Regression analysis was undertaken to identify the most significant parameters under each Evaluation Criteria which contributed to the overall rating for that Criteria. This enabled the shortlisting of parameters that respondents perceive most critical for the success of each Evaluation Criteria, as produced in the following table.

Since the number of responses for CBPs were low (15), the results of statistical analysis undertaken on the responses are likely to be influenced by the responses of only a few respondents. Hence, the results from this small base of responses have not been used exclusively for deriving insights, but have been supplemented with insights from ratings analysis as well as qualitative responses.

Table 5: Regression Analysis - Most significant parameters

Evaluation Criteria	Parameter	Beta Value	Significance Value	Corresponding question asked in Survey
Relevance	Relevance of CBP topics	0.794	0.014	Were the topics of the CBP relevant to the functions of the SERC?
	SERCs Involvement	0.714	0.005	What was the level of involvement of the SERC in selecting the topics of the CBP?
Efficiency	Quality of CBP arrangements	0.325	0.238	How would you rate the quality of coordination and logistical arrangements for organization of the CBP?
	Partner Performance	0.469	0.091	How would you rate the performance of the knowledge partner in organizing the CBP?
Effectiveness	Quality of Presentations	1.443	0.002	How would you rate the clarity, structure, and presentation of the CBP presentation/training material?
	Feasibility of Recommendations	2.687	0.002	Were the CBP recommendations feasible for implementation?
Impact	Increase in Awareness	0.539	0.007	Did the CBP contribute in creating awareness and enhancing the knowledge base of SERC members?
	Contribution to Issue Resolution	0.245	0.183	Did the CBP contribute to actual resolution of prevalent issues in the state?
Sustainability	Withstanding future challenges	1.045	0.000	Can the recommendations of the CBP withstand practical challenges in the future?

The given parameters influence the rating of each Evaluation Criteria the most, and therefore hold most significance for the SERCs. Therefore, each of these parameters needs to be scrutinized for satisfactory conduct of each CBP.

Factor Analysis (Principal Components) was also undertaken to identify new groups of parameters as per the proximity/similarity of response trends. The major groupings observed from the analysis were:

Conduct and delivery of CBPs	Involvement of SERCs	Applicability of CBPs

The given groups thus outline the overarching parameters which are responsible for the perception of CBPs. Such overarching parameters should be kept in mind while organizing and conducting future CBPs to ensure capacity enhancement of attending SERC personnel.

Qualitative Responses

Qualitative feedback was also received with the aid of the surveys for both Studies and CBPs, as summarized below.

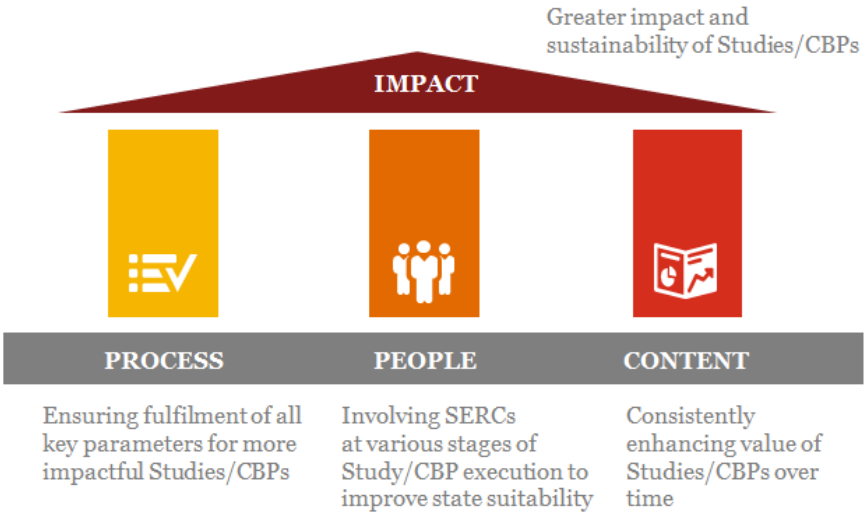
Table 6: Qualitative Feedback

Studies/CBPs	Qualitative Feedback
Studies	**Involvement of SERC personnel in conduct of Studies** • Involving SERCs and other stakeholders to make studies easier to adopt and implement • Involving SERC officers for state-level inputs and to build their capacity building • A platform to interact with other ERCs is required along with interactive and brainstorming sessions • Thorough discussions with consultants required from the beginning • Ensuring involvement of experienced personnel from SERCs • Involving senior staff for finalization of studies to improve quality of studies • Topics selections should be done in more scientific manner
	Enhancing quality of studies • Incorporating state-specific data and scenarios to improve quality of studies and provide clarity for decision making, especially for forward-looking studies • Duly incorporating inputs from smaller states in the planning stages • Legal aspects may also be incorporated wherever pertinent • Analysis can be more objective with a viable number of limited alternatives • Mechanism for updating data at regular intervals should be explored • Geographical and climatic variations should be incorporated • A few studies are medium term in sustainability, and with many changes pending in the power sector, states inclined to adopt a wait and watch approach
CBPs	**Conduct of CBP sessions** • For internationally held CBPs, field visits along with the CBP and involving the country's regulator • Number of days can be increased for greater expertise building • More interactions for relevant topics; and dedicated session for brainstorming and discussions • Participation of other relevant stakeholders (CERC, FOR, MoP etc.)
	Programme content • Pre-CBP material to be sent for better preparation of participants • International perspective to improve across topics • Programme material to be better suited to participants • Training on basic issues as well for which SERC personnel need expertise

Phase 4: Framing Recommendations and Roadmap

In accordance with identified focus areas, the following framework has been outlined, which emphasizes on the pillars of Process, People and Content, as depicted below:

Figure 7: Pillars for improving impact of Studies and CBPs



On the basis of identified focus areas for each of the pillars, the following recommendations have been devised and mapped across the stages of Planning, Execution and Application. To aid their implementation, certain tools and techniques have also been suggested, which form the foundation of the following recommendations.

Table 7: Summary of Recommendations

Pillars	Planning Stage	Execution Stage	Application Stage
Process	• Forming of working groups comprising of select SERC personnel to ensure greater coordination • Establishing a communication template and mechanism to ensure constant information exchange	• Formalize a framework to shortlist appropriate states/other countries for case studies to ensure representation and suitability • Formalize a framework/checklist to cover critical parameters for in-depth, all-rounded content	• Reinforcing Study findings and recommendations through focused discussions in CBPs and other forums • Formulate a roadmap to tackle complex issues in successive steps over a period of 5 years through Studies and CBPs
People	• Floating interest survey to SERCs for deciding topics of Studies and CBPs • Utilizing survey and working group feedback for designing content for SERC personnel and prospective CBP participants	• Developing an online discussion forum as a more informal forum for discussions on best practices, along with invited experts/stakeholders • Ensuring periodic communication between stakeholders for informing progress and receiving inputs/feedback	• Survey for capturing feedback immediately after completion of Studies & CBPs • Produce state-wise challenges for implementation as an outcome of each Study and CBP
Content	• Using parameter checklist to outline outcomes during planning with added focus on international benchmarking, state representation, enablers for implementation and resolution of challenges.	• Interim review of content from relevant stakeholders, with an early focus on state-specific challenges and adoption of possible solutions.	• Outlining enablers for recommendations and tailor recommendations for lagging and leading states • Discussion on long-term relevance of Studies a must for finalization of Studies
• *Interest Survey to gather most relevant topics for future Studies and CBPs from SERCs* • *Checklist of critical parameters to ensure coverage of all aspects across lifecycle of Study/CBP* • *Online forum for regular discussions on pertinent issues* • *Communication template for receiving data, inputs and other feedback*			

Conclusion

The exercise of assessing impact of such Studies and CBPs has revealed that while SERCs have valued the quality of study reports, CBP presentations and related content, they seek a parallel mechanism wherein they are duly involved and motivated to contribute in a meaningful manner. Such a mechanism will also make it easier for states to embrace and adopt Study and CBP outcomes, initiating a healthy cycle of feedback-driven Studies and CBPs.

Key areas of improvement and areas of strength brought forth in this assignment have been summarized below, along with recommended tools and techniques.

Table 8: Conclusion summary

Areas of improvement	Areas of strength	Recommended tools and techniques
• Greater inclusion and involvement of SERCs across lifecycle of Studies and CBPs • Allowing more interaction between SERCs for communication of best practices • Ensuring coverage of parameters as perceived significant by SERCs by all Studies and CBPs • Greater focus on adoption of recommendations by SERCs for the purpose of fulfilling their functions and resolution of pertinent issues	• Enhancement of knowledge and awareness regarding complex issues with the help of Studies and CBPs • Incorporation of national case studies and best practices employed in various states • Sustainability of recommendations and ability to withstand future trends	• **Appointment of a working group** for specific Studies/CBPs for greater coordination and ensuring accountability from all stakeholders • **Interest survey** to gauge key topics to be covered in Studies and CBPs • **Checklist of critical parameters** necessary for impactful Studies and CBPs to be fulfilled at every stage of Study and CBP lifecycle • **Online forum** for regular discussions on pertinent issues • **Communication template** for coordination between FOR Secretariat and SERCs: receiving data and inputs, scheduling formal review sessions or informal interactive sessions, receiving qualitative feedback, etc.

For the purpose of assessing the impact of FOR Studies and CBPs conducted in the past 5 years, a lifecycle approach based on OECD-DAC principles was followed. Such an approach can also be utilized in the future to ensure assessment of specific initiatives, continual focus on impact and application of Studies and CBPs, greater orientation towards results and outcomes, increase in knowledge of SERC personnel regarding pertinent issues, and comparability of outcomes over time. Continued consultations with SERCs as a part of the final phase will ensure that the recommendations of this assignment are further delineated and a cohesive roadmap is formulated for the conduct of Studies and CBPs in the future.

1. Overview

1.1. About the Forum of Regulators

The Forum of Regulators (FOR) was constituted vide Notification dated 16th February, 2005 in pursuance of the provision under section 166(2) of the Electricity Act, 2003. The Forum of Regulators (FOR) is formed by the Chairman of all State Electricity Regulatory Commissions (SERC) with the Chairman of Central Electricity Regulatory Commission (CERC) as the Chairman of FOR. FOR is responsible for harmonization, coordination and ensuring uniformity of approach amongst the Electricity Regulatory Commissions across the country, in order to achieve greater regulatory certainty in the electricity sector.

Functions of FOR

- Analysis of the tariff orders and other orders of Central Commission and State Commissions. Compilation of data with a focus on efficiency improvements of the utilities.
- Harmonization of regulation in power sector.
- Laying of standards of performance of licensees as required under the Act.
- Regulate entry and exit in transmission, distribution and trading through licenses. Operationalise Open Access in transmission and distribution.
- Sharing of information among the members of the Forum on various issues of common interest and also of common approach.
- In house or outsourcing of research work which is relevant to power sector regulation
- Protection of interest of consumers through prevention of market dominance, ensuring adequate returns to the investor, promotion of efficiency, economy and competition in power sector- evolving measures for the same.

1.2. Background of the study

In discharge of its functioning, the Forum of Regulators (FOR) conducts Studies and Capacity Building Programmes (CBPs) for State Electricity Regulatory Commissions (SERCs) on priority domains in the power sector to aid SERCs in enhancing knowledge on pertinent issues, benchmarking themselves against national and international frameworks, and developing roadmaps for future implementation.

FOR has organized 5 CBPs during the past 5 years (2013-2017) which have focused on new sector areas of renewable energy, demand side management, energy efficiency, as well as prevailing domains of technical performance improvement, tariff reforms, and functioning of CGRF and Ombudsman. Besides organizing the CBPs, the FOR has also availed consultancy services for 20 studies conducted during the past 5 years, conducted on a number of salient issues including performance assessment of distribution utilities, reduction in technical and commercial losses, competition in retail supply, supporting community-level off-grid projects, functioning of CGRF and Ombudsman, and promotion of renewable energy.

The FOR has decided to carry out an independent Impact Assessment of the Studies and Capacity building workshops undertaken during the past 5 years and analyse whether these activities are in line with the functions of the Forum as outlined in sub-rule (2) of Rule 6 of the Forum of Regulators Rules, 2005. PricewaterhouseCoopers Pvt. Ltd. (PwC) was appointed by FOR to assist in carrying out the tasks required for the study.

1.3. Objectives of the study

As outlined in the TOR, the objective of this study is to conduct a comprehensive study on

1. Impact assessment of the Capacity Building Programmes undertaken by the Secretariat of FOR during the Twelfth Five Year Plan Period; and
2. Impact assessment of the Studies conducted by the Secretariat of FOR during the Twelfth Five Year Plan Period.

1.4. Scope of work

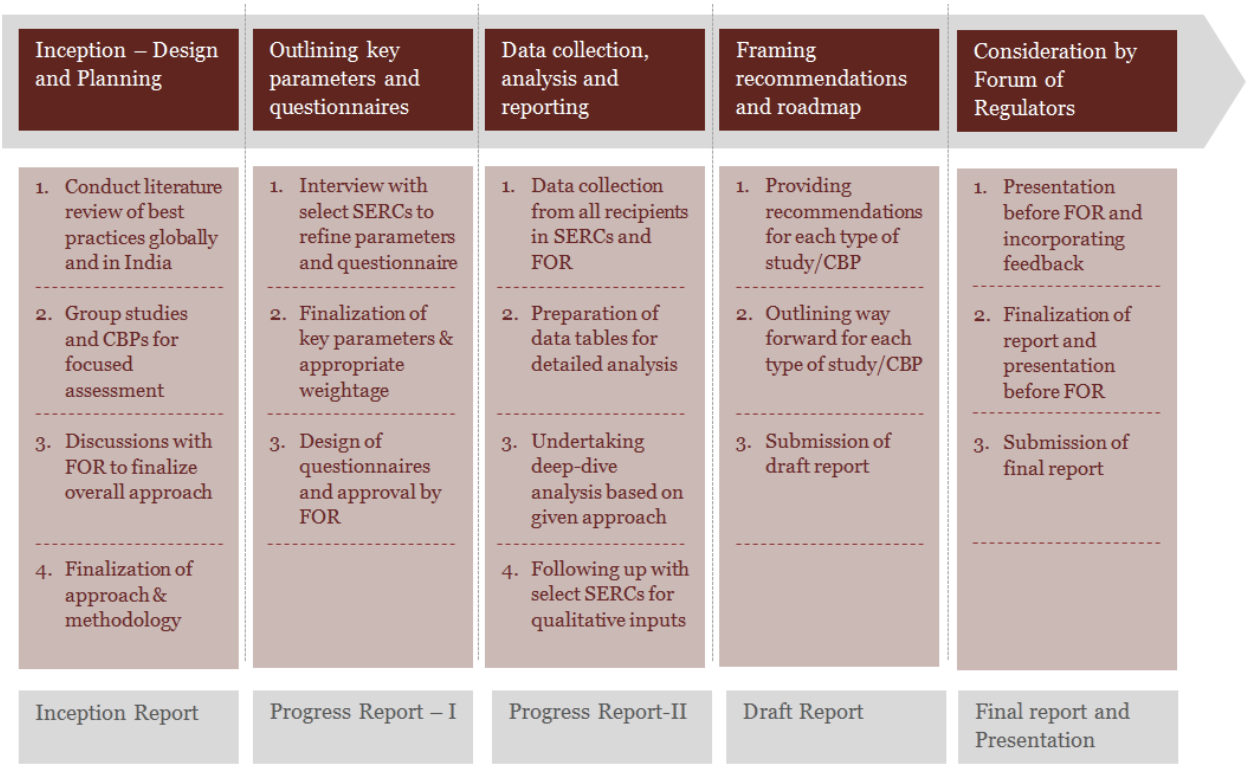
As per the Terms of Reference, PwC is required to carry out the following tasks:

1. Design parameters for impact assessment;
2. Conduct impact assessment vis-à-vis the objectives of the Forum;
3. Detailed analysis of feedback obtained from various State Electricity Regulatory Commissions (SERCs) and Joint Electricity Regulatory Commissions (JERCs) with regard to Capacity Building Programmes
4. Make recommendations to enhance the impact of Studies and Capacity Building Programmes conducted by the Secretariat of FOR; and
5. Any other related issue.

1.5. Phase-wise approach for this study

Based on the given Scope of Work, the framework for Project execution has been developed under five main stages: Inception - Design and Planning, Finalization of Key Impact Parameters, Data Collection and Analysis, Framing Recommendations and Roadmap, and Stakeholder Consultation. The phase-wise approach and tasks that have been carried out in each phase are depicted below.

Figure 8: Phase-wise approach for the study



The key outcomes of each stage (Literature review of impact assessment frameworks, development of parameters, design of surveys, analysis of responses and recommendations) have thus been elaborated in the following sections.

2. Literature review of best practices in impact assessment

To gain a greater understanding of various approaches and applications of impact assessment as employed by regulators/policy makers in India and around the world, few of the most well-established frameworks created to assess the effects of programmes, schemes, studies and specific interventions have been studied.

Most approaches to impact assessment aim to determine whether the initiatives taken lead to the intended results, that the intervention made is the *cause* of the intended *effect*. It is therefore pertinent that the best practices from across the world are studied before developing a customized IA methodology for this study with FOR Studies and CBPs as the *cause* and adoption of Study and CBP outcomes by SERCs as the *effect*.

Identification of challenges:
Lack of coverage of all parameters, lack of comparability between evaluations over time, and low involvement from sponsors/regulators/other stakeholders

Designing Impact Assessment approach:
A suitable impact assessment framework is then determined to ensure that key objectives are met and relevant challenges are mitigated

In the following sections, the **internationally recognized standards in IA methodology** are briefly discussed. A list of studies consulted for assessing impact assessment frameworks in the international domain has been provided in the Annexure (Section 6.1).

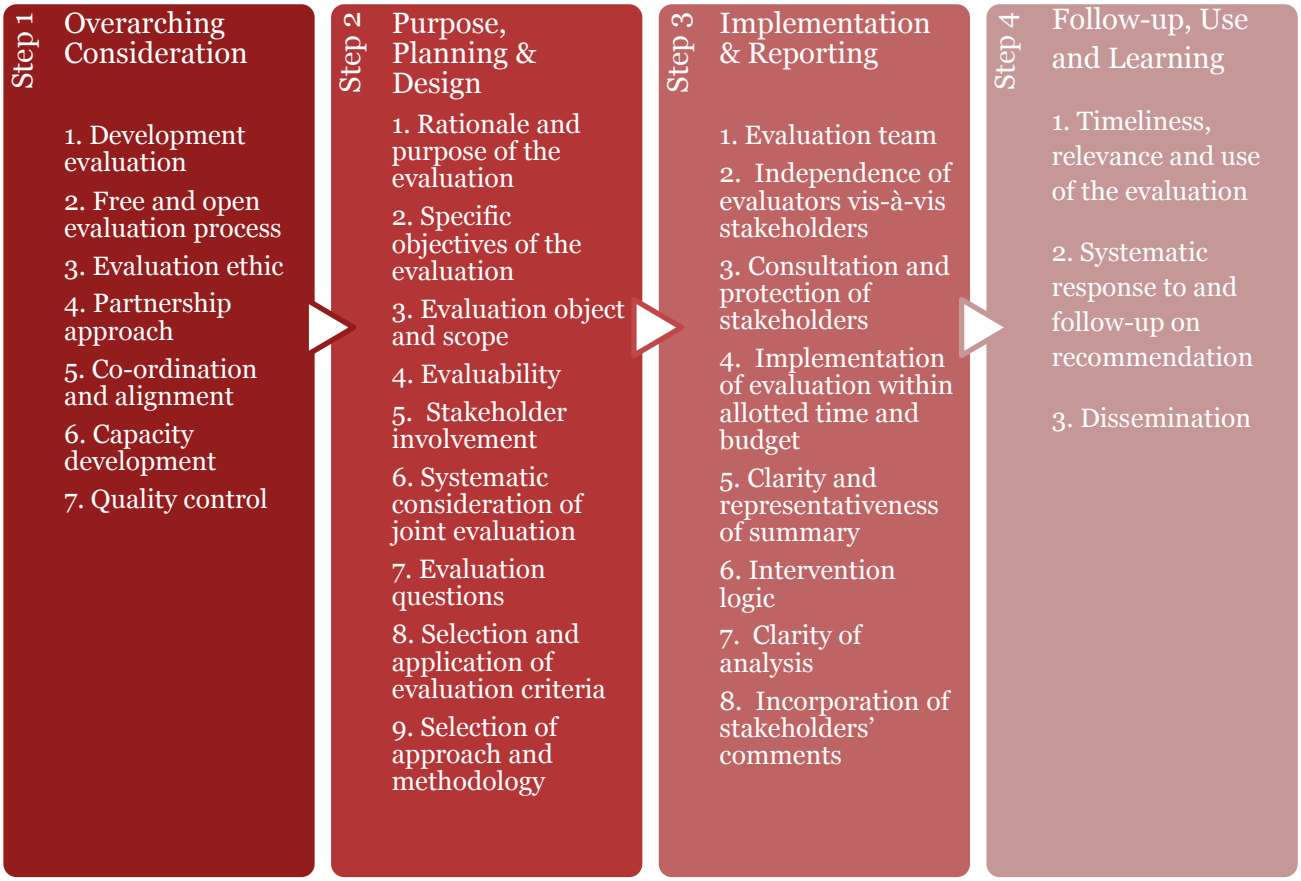
2.1. Frameworks for Impact Assessment - International

2.1.1. DAC Quality Standards for Development Evaluation

These standards are published by 'The Network on Development Evaluation' which is a subsidiary body of the Development Assistance Committee (DAC) at the OECD (Organisation for Economic Co-operation and Development) based out of Paris, France. Its purpose is to increase the effectiveness of international development programmes by supporting robust, informed and independent evaluation.

The DAC Quality Standards for Development Evaluation reflect an evolving framework and provide a guide to good practice in development evaluation. Built through international consensus, the Standards are intended to serve as an incentive and inspiration to improve evaluation practice.

The overall evaluation guidelines as per the DAC Quality standards can be represented as follows:



The above diagram outlines all possible considerations for the evaluation process of a study, which can be incorporated as per the requirements of the given context.

The five OECD/DAC criteria for evaluations are defined as follows:

Table 9: OECD - DAC Evaluation Criteria

Evaluation Criteria	Description
Relevance	How important is the **relevance or significance** of the intervention regarding local and national requirements and priorities?
Effectivenes	How effectively are the objectives of the development interventions being achieved?
Efficiency	Are the objectives being achieved with the optimal use of time, effort, aid and other resources?
Impact	Does the development intervention contribute to reaching higher level development objectives (preferably, overall objective)? What is the **impact or effect** of the intervention in proportion to the overall situation of the target group or those effected?
Sustainability	Are the positive effects or impacts sustainable? How is the **sustainability or permanence** of the intervention and its effects to be assessed?

In all evaluations based on the OECD-DAC principles, the evaluation questions must be formulated in accordance with the OECD/DAC evaluation criteria of **Relevance, Effectiveness, Efficiency, Impact and Sustainability.**

The OECD-DAC framework allows comprehensive coverage of parameters across the evaluation criteria, and reinforces the importance of impact and sustainability of activities even before the commencement of any programme. This makes the framework result-oriented, and favorable for a wide range of applications across sectors.

2.1.2. Evaluation Cooperation Group – Good Practice Standards on Evaluation

The Development Committee Task Force on Multilateral Development Banks (MDBs) based in Washington DC issued a report in 1996 which called for harmonization of evaluation methodologies, performance indicators, and criteria by MDBs. In response to the task force's recommendations, the Evaluation Cooperation Group (ECG) was formed, to be based in Washington DC, with a mandate to embody and endorse MDB evaluation harmonization.

The ECG consisted initially of the heads of the evaluation units of the five MDBs referred to in the task force's report: the African Development Bank (AfDB), Asian Development Bank (AsDB), European Bank for Reconstruction and Development (EBRD), Inter-American Development Bank (IADB), and World Bank Group (WBG). A number of International Financial Institutions (IFIs) have joined the ECG since then and by 2011, total membership has reached nine (9) comprising of the heads of evaluation units of the five founding MDBs, the European Investment Bank (EIB), the International Monetary Fund (IMF), Islamic Development Bank (IsDB), and the International Fund for Agricultural Development (IFAD).6 In 2012, Black Sea Trade and Development Bank (BSTDB) and the Council of Europe Development Bank (CEB) have been accepted as full members and membership processing is underway.7 Meanwhile, ECG has three observers who are the heads of evaluation units of the United Nations (UN), Development Assistance Committee of the Organisation for Economic Co-operation and Development (OECD-DAC), and the Global Environment Facility (GEF).

The ECG (i) works to strengthen cooperation among evaluators and (ii) seeks to harmonize evaluation methodology in its member institutions, so as to enable improved comparability of evaluation results while taking into account the differing circumstances of each institution.

ECG has developed and implemented the Good Practice Standards (GPS) for four categories of MDB evaluations covering governance and independence of evaluation function, public and private sector operations, and country strategy and program. ECG's GPS for the Evaluation of Public Sector Operations aim mainly to establish standards for the evaluation of interventions that meet good evaluation practices generally accepted in the evaluation literature and backed by the experience of ECG members; and facilitate the comparison of evaluation results across ECG members, including the presentation of results in a common language.

A summary of standards and elements provided in ECG's GPS for evaluation of public sector operations has been provided as follows.

Table 10: ECG Good Practice Standards

Evaluation Principle	Standards	Elements	Description
Report Preparation and Processes	**Timing**	Performance Evaluation Reports	Scheduled to ensure that sufficient time has elapsed for outcomes to be realized and for the sustainability of the operation to be apparent
	Coverage and Selection	Accountability and Learning	Establish a mix of evaluation products that balances accountability and learning
		Sample Size	Sample is representative of the population of projects ready for evaluation
		Sampling Methodology	Sampling methodology and significance of trends
	Consultation and Review	Stakeholders' Consultation	Stakeholders that are consulted in the preparation of evaluations
		Review	Iniital review to ensure quality and

Evaluation Principle	Standards	Elements	Description
			usefulness
Evaluation Approach and Methodology	**Basis of Evaluation**	Objective-based	Evaluations are primarily objectives-based
		Unanticipated outcomes	Consideration of unanticipated outcomes
		Evaluation of policy-based loans(PBLs)	Evaluations of PBLs assess the performance of the reform program as a whole.
	Criteria	Scope of Evaluation	Evaluations encompass all performance attributes and dimensions that bear on the operation's success.
		Relevance	Both the relevance of objectives and the relevance of project design to achieve those objectives.
		Effectiveness	Extent to which the project achieved (or is expected to achieve) its stated objectives, taking into account their relative importance.
		Intended Outcomes	The assessment of Effectiveness uses appropriate methods to determine the contribution of the project to intended outcomes in a causal manner
		Efficiency	(i) Did the benefits of the project (achieved or expected to be achieved) exceed project costs (ii) Were the benefits of the project achieved at least cost?
		Sustainability	Risk that changes may occur that are detrimental to the continued benefits associated with the achievement or expected achievement of the project's objectives
	Ratings	Criteria Rating	Assigned rating to each criteria
		Rules	Rules for assigning criteria
		APPI	An Aggregate Project Performance Indicator (APPI) is constructed from the core criteria.
Dissemination and Utilization	**Dissemination and Utilization**	Synthesis Report	A periodic synthesis report (every 3 years) covering the criteria and rating systems used in the evaluations
		Accessibility and Dissemination	Strategy to disseminate evaluation findings and lessons to all stakeholders
		Utilization of Evaluation Recommendations	Follow-up on implementation of recommendations with specific, time-bound set of actions to be taken

The given set of standards allow all evaluations to be undertaken in a similar format and the subsequent results are easier for participating stakeholders to adopt.

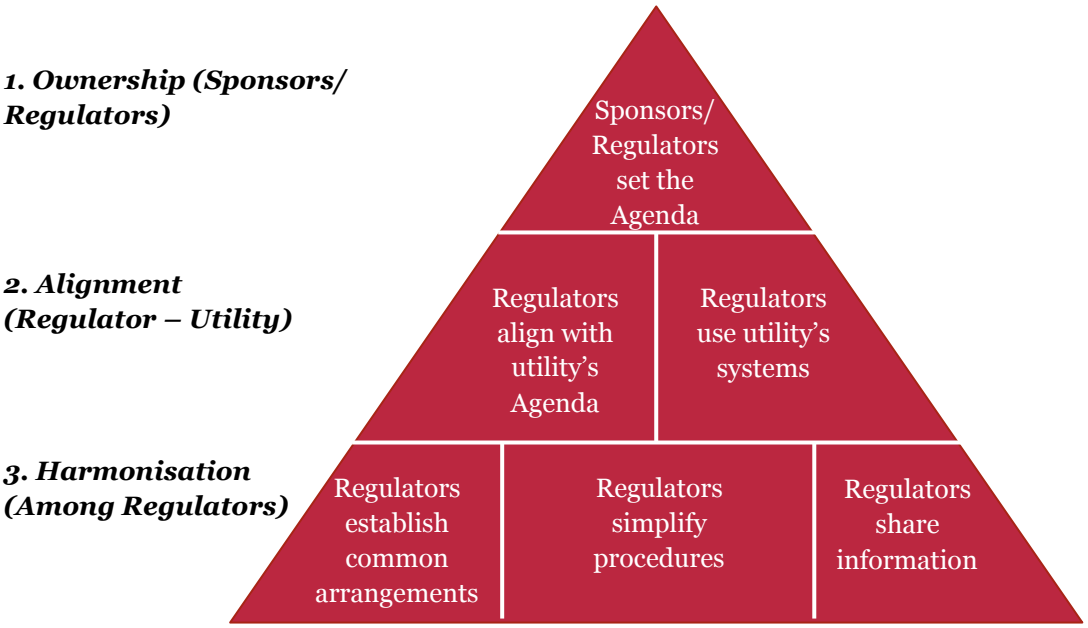
The ECG Good Practice Standards thus enable a methodical approach to undertake impact assessment, facilitate comparability of results over time and allow greater coordination between stakeholders.

2.1.3. The Paris Declaration and the Accra agenda for action

Impact assessment studies become crucial when large amount of public money is invested in development programs. This topic has been centre of various discussions and debate in recent years and there have been some significant developments.

The Paris Declaration (2005) and the Accra agenda for action (2008), established in Accra, Ghana, were the result of heightened concern over the implementation development goals set by governments and funding agencies. Global levels of aid financing had risen steadily over the past decades, but by the turn of the 21st century, it became clear that these increases in aid volume were not producing the impacts expected, sparking a growing global consensus that the issue of aid effectiveness deserved closer scrutiny. The key take away of regulatory IA scenario can be summarised in **three principles** as follows:

Figure 9: Principles for ACCRA agenda for action



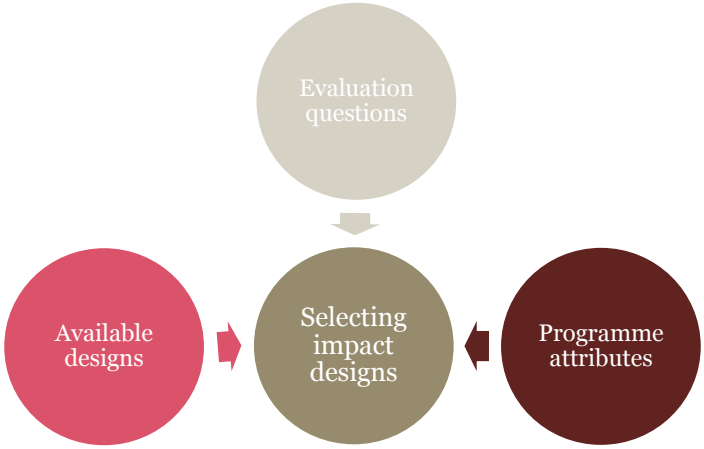
The Principles for ACCRA agenda for action thus outlines roles and responsibilities of stakeholders, directs greater flow of information and holds all stakeholders accountable for desired outcomes.

2.1.4. Designs and Methods for Impact Evaluation – DFID study

The main purpose of the study was to develop a broader range of rigorous designs and methods for impact evaluations. The idea was conceptualised over the realisation that a major portion of IA studies do not warrant a completely quantitative approach. Therefore the research was aimed at establishing a credible and robust expanded set of designs and methods that were suitable for assessing the impact of complex development programmes.

- The study identifies the kinds of evaluation questions that are of interest to policy makers/regulators. This is achieved through the understanding that certain questions can only be answered by certain designs. Only a clear understanding of the specifics of a study or program attributes can lead to the selection of suitable evaluation designs and methods
- It concludes that selecting 'designs' for IE should be seen as a process of aligning evaluation questions – which must be at the heart of any evaluation – with an available repertoire of designs and the attributes of development programmes. This is depicted in following figure:

Figure 10: DFID - Mechanism for selecting impact design



Designs and Methods for Impact Evaluation – DFID thus enables policy makers to clearly define objectives and evaluation questions before undertaking impact assessment and determine the right tools accordingly.

A summary of the international frameworks outlined above and their underlying principles have been summarized below:

Figure 11: Summary of international frameworks on impact assessment

Framework for Impact Assessment	Features of Impact Assessment Approach	Underlying Principles
OECD/DAC Quality Standards for Development Evaluation	1 Overarching considerations; 2 Purpose, Planning & Design; 3 Implementation & Reporting; 4 Follow-up, Use & Learning *Relevance – Efficiency – Effectiveness – Impact - Sustainability*	• *Lifecycle-based approach* • *Comprehensive coverage of quality parameters*
Evaluation Cooperation Group – Good Practice Standards on Evaluation	Report Preparation and Processes: Timing, coverage and review Evaluation Approach and Methodology: Basis of evaluation, criteria & ratings Dissemination and Utilization: Accessibility & utilization	• *Comparability of results over time* • *Easier to adopt and undertake*
Paris Declaration (2005) and the ACCRA agenda for action (2008)	**Ownership:** Sponsors/Regulators set the agenda **Alignment:** Regulators align with utility's agenda **Harmonization:** Coordination among regulators	• *Greater involvement and coordination from stakeholders*
Designs and Methods for Impact Evaluation – DFID	Evaluation Questions → Appropriate Tools & Parameters → Selecting Impact Designs	• *Customized approach for studies that are not completely quantitative*

OECD/DAC standards for development evaluation allow a study to establish causality between factors, ensure comprehensive coverage of relevant parameters, scope for addition of parameters at a later stage, incorporation of stakeholder feedback, ensure long-term relevance and sustainability of results, and crucially, create a uniform platform for comparability of results over time. 'Good Practice Standards on Evaluation' as established by DAC also established rules to increase uniformity in evaluation techniques and is therefore easier for evaluators to adopt and replicate. Both these frameworks can thus be used for deriving a suitable guiding framework for this study, while learnings from other methodologies can drive greater stakeholder coordination and accountability.

2.2. Frameworks for Impact Assessment - National

Impact Assessment studies in India have used an approach or a combination of approaches such as economic, experimental/quasi experimental, formative, impact, meta, mid-term, participatory, policy, process, summative, synthetic, thematic and theory-based on the basis of the objectives and requirements of the study. These approaches have been briefly discussed as follows:

Table 11: National frameworks on impact assessment

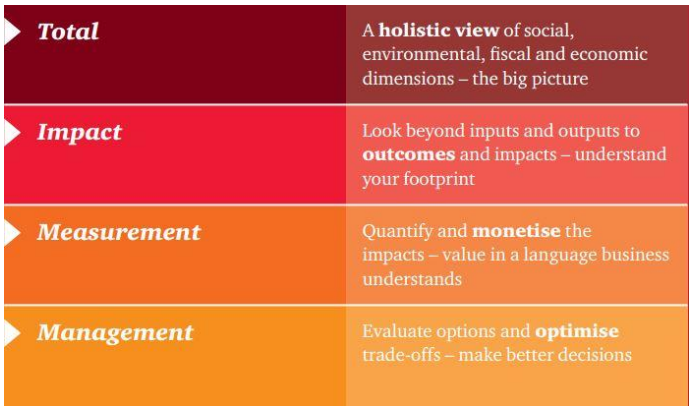
Evaluation approach	Brief Description
Summative/ Intervention Based or Formative	Summative evaluations seek to examine the effects or outcomes of an intervention, and seek to describe what has happened as a result of an intervention and aim to determine whether the intervention itself has caused the outcomes which are observed. Formative evaluation is a powerful tool for improving the delivery of programmes of projects which are being evaluated, as findings gathered at regular intervals within such an evaluation can be used to enhance or improve the programme or project.
Criteria/Parameter Based	Evaluation of impact on the basis of specific criteria or indicators which are likely to influence outcome.
Theory based	This form of evaluation is based on careful articulation of a model for delivery of an intervention – this is often known as a logic model or theory of change. The model which is devised is then used as a guiding framework for evaluation. The evaluation seeks to develop a clear understanding of the intervention process, including the situation in which the intervention operates, through to the inputs, activities, outputs, outcomes and impacts which result from these.
Participatory	This form of evaluation seeks to actively engage stakeholders (including funders, delivery partners and beneficiaries) in developing the evaluation from the outset and over the period of its implementation. This typically includes involving funders and delivery partners in the design of the evaluation and fieldwork and communicating with beneficiaries before, during and after the evaluation has been completed.
Other key techniques	
Economic/Impact	These approaches comprise a range of methods which are used to identify measure or value the work delivered by a project, programme or theme, in order to optimise use of resources or benefits from an intervention.
Experimental/Quasi experimental	Experimental studies assess the effectiveness of a programme in changing outcomes as they compare the experience and outcomes in a group of randomly assigned programme participants (known as a treatment group) with a group of non-participants (known as the control group)
Thematic	Thematic evaluations are those which seek to assess the quality of interventions related to a specific theme that is being delivered through a range of programmes, and across a number of institutions and/or sectors.

PwC's Total Impact Measurement and Management (TIMM) Framework

PwC's TIMM Framework enables a sustainable mechanism to identify, measure and evaluate the work delivered by a programme for all concerned stakeholders. The framework allows a holistic view of the value delivered

across the lifecycle of a project, the outcomes of organizations' activities on all stakeholders, and the possible trade-offs between different decisions and options that are crucial for an organization's effectiveness.

Figure 12: PwC TIMM Framework



The use of a holistic tool to assess the impact of key initiatives can thus be applicable wherever specific interventions are likely to influence many factors and produce varying results.

PwC TIMM framework thus ensures that decision making is driven by a 360 degree view of impact and quantified implications for each stakeholder.

A summary of underlying principles and learnings from impact assessment frameworks in the national context have thus been given below:

Figure 13: Summary of national frameworks on impact assessment

Framework for Impact Assessment	Features of Impact Assessment Approach	Referred Studies	Underlying Principles and Learnings
Summative/ Intervention Based	• Examine the effects of an **intervention**: scheme/programme • Examine groups with or without intervention over time	• *Role of PDS in Shaping Household and Nutritional Security, Efficacy of Minimum Support Prices (MSP) on Farmers - NITI Aayog*	***Accurate estimation of the effects of specific interventions***
Criteria/Parameter Based	• Evaluation of impact on the basis of **specific criteria or indicators** that are likely to influence outcome.	• *Elementary Education Scheme in Rural Punjab, leadership development of minority women, quality education for girls – NITI Aayog*	***Quick-fire analysis on the basis of key indicators***
Theory Based/ Result Based	• **Inputs, activities, outputs, outcomes and impacts** which result from Studies and may be based on specific interventions	• *Mahila Shikshan Kendras under Mahila Samakhya Programme by PwC, Improving maternal and child health in India by 3ie, IA of FOR Studies (2013)*	***Assessing returns as per resources used; allows parity in results***
Participatory/ Consultative	• **Actively engage stakeholders** in developing the evaluation from the outset	• *Evaluation of Mid-Day Meal Programme in Karnataka, Evaluation of Financial Assistance Schemes of APEDA by PwC*	***Greater involvement and ownership of IA objectives***
PwC TIMM Framework (Total – Impact – Measurement – Managament)	• **PwC TIMM framework** to identify, measure & value the work delivered by a programme for all concerned stakeholders	• *Developing Impact Evaluation Methodologies, Approaches, and Capacities in Selected Developing member Countries for ADB in Madhya Pradesh*	***Holistic view of impact – sector, social, economic, environmental etc.***

The criteria-based approach allows us to pre-determine objectives and criteria for focussed evaluation, while a consultative approach allows additional inputs from stakeholders at all stages of the evaluation process. Both these approached can guide us in framing our approach, as shown in the following section.

2.3. Selecting an appropriate framework

To develop our approach and methodology for this assignment, key factors that should be fulfilled by the derived approach have been outlined. These factors have been mapped against the frameworks that have been studied in the national and international context. Additionally, learnings from other frameworks has been incorporated which will also drive the framing of a suitable framework for this assignment.

Table 12: Selection of Impact Assessment Framework

Key approaches in Impact Assessment	Contribution of factors			Explanation of factors			Effects of factors	
	Establishes causality	'Necessity' and 'Sufficiency' of factors	Flexibility for additional parameters & re-evaluation	Influence of factors	Stakeholder involvement	Uniformity, Parity, and Comparability	Long-term effects and threats	Enables decision making
Frameworks considered for impact assessment								
OECD/DAC Principles: Relevance, Efficiency, Effectiveness, Impact, Sustainability	✓	✓	✓	✓	✓	✓	✓	✓
Theory of Change: Inputs, Activities, Output, Outcomes	✓			✓	✓	✓	✓	✓
Cost-Benefit Analysis	✓					✓		✓
Participatory/Consultative	✓		✓	✓	✓			
Criteria-based/Scenario based	✓			✓				
Formative/Time-series approach			✓		✓		✓	✓
Intervention-based: Experimental/Sample	✓							✓
Frameworks which drive underlying principles for this assignment								
ECG Good Practices Standards	*Ensuring a uniform framework that can be utilized in the future for similar studies, and allows comparability of results.*							

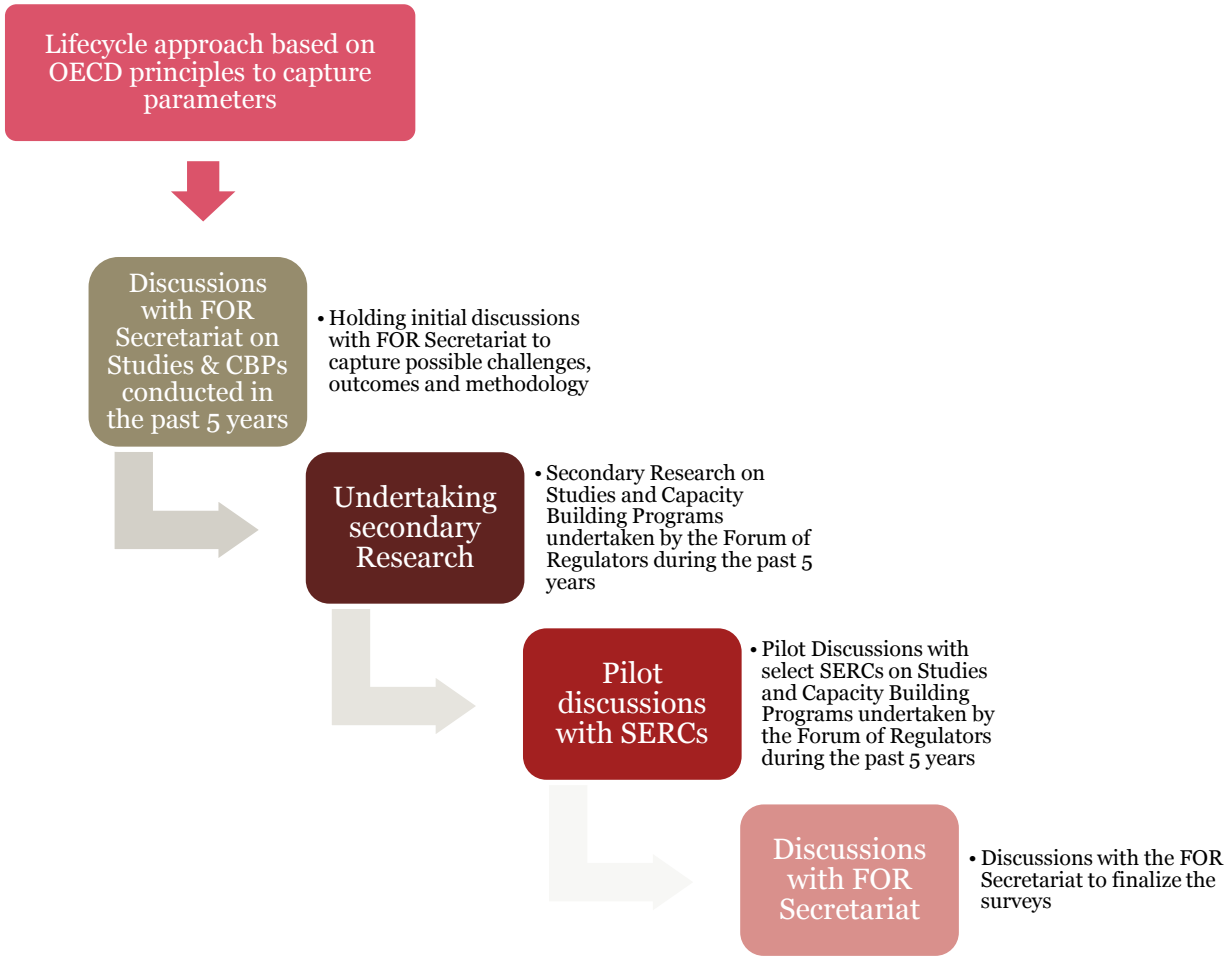
Principles for ACCRA agenda for action	*Ensuring that all stakeholders are involved in a methodical and accountable manner*
Designs and Methods for Impact Evaluation – DFID	*Ensuring that objectives and evaluation questions for impact assessment are formalized before undertaking the same*
PwC TIMM Framework	*Ensuring that a holistic view of impact assessment is undertaken – understanding the regulatory, administrative, technical and people implications of this exercise*

It can be seen that OECD/DAC Principles fulfill all the given factors; they allow comprehensive understanding of all parameters across the lifecycle of a project, provide substantial focus on impact and sustainability of study findings and enables the development of a decision matrix for future action. Learnings from other frameworks are also found to be useful in creating a uniform and sustainable framework.

The framework for impact assessment is thus based on this approach, wherein the evaluation criteria of **Relevance, Efficiency, Effectiveness, Impact and Sustainability** have been mapped across the lifecycle of **Planning, Execution and Application** of a study or CBP to adequately cover all key parameters, with appropriate focus on the impact and long-term relevance of Studies and CBPs.

3. Approach for designing surveys

To ensure that all relevant parameters and concerns are captured and clearly delineated for designing of surveys, a lifecycle approach was adopted based on OECD-DAC principles to guide discussions with stakeholders, and all parameters were captured under the given framework.



The given steps have been elaborated in the following section.

3.1. Discussions with FOR Secretariat on Studies and CBPs conducted in the past 5 years

Discussions were held with FOR Secretariat to capture the learnings of conducting Studies and CBPs in the past 5 years, with key challenges faced and focus areas for impact assessment. It was ensured that a lifecycle approach is utilized in these discussions to map challenges across all stages of conducting Studies and CBPs, and desired outcomes of this study are formalized.

Feedback received from SERCs for Capacity Building Programs in the last 5 years (as provided by the Forum of regulators was evaluated to ensure that key concerns of participants from SERCs was duly incorporated in the framing of parameters and surveys. A few of the salient concerns of SERC participants have been captured below and grouped under the lifecycle stages of Planning, Execution and Application/Implementation.

Table 13: Feedback received from SERCs for CBPs

Planning	Execution	Application/Implementation
• Topics may be relevant to	• Incorporating more	• Separate sessions for group

Planning	Execution	Application/Implementation
prevailing challenges faced by SERCs • Number of days for conducting a Capacity Building Programme may be increased • Material of CBP may be forwarded to participants in advance to ensure adequate preparation for the same • Structuring of CBP and sequencing of topics may be improved	components of international experience, with focus on regulatory reforms in south-east Asia and other developing nations • Comparison of experiences in India should be incorporated • Legal aspects as well as related cases in APTEL as applicable may also be incorporated • Training material should be customized as per the audience	discussions and brainstorming may be arranged for SERCs • Site visits may be arranged to better understanding implications of issues discussed • Implementation hurdles for SERC officers and staff should be incorporated • If CBP held in another country, the regulatory authority of the given country may also be involved

The questions in surveys have thus been framed taking such concerns into consideration.

3.2. Undertaking secondary Research

To outline key features that would influence the structure of survey questions and adequately assess the impact of Studies and CBPs undertaken by FOR, the study reports, agenda for the workshops, programme outlines and other relevant documentation for the Studies and Capacity building workshops conducted in the past 5 years were analyzed. Categorization of Studies and Capacity Building Workshops was undertaken for a more focused assessment of the same.

Categorization of Studies

Since a large number of studies (20) have been conducted in the past 5 years from FY 2011-12 to FY 2016-17, categorization of such studies on the basis of domain/knowledge area was undertaken so that a more focused assessment of the impact of each of the domains is evaluated, and the way forward for each domain is determined accordingly.

Based on our assessment of Studies and CBPs conducted in the past 5 years from FY 12 to FY 17, it is proposed that the following categorization of Studies into 5 groups is undertaken: **Sector reforms, Technical performance, Commercial performance and tariff reforms, Promotion of consumer interests and Promotion of DSM, renewable energy and other reforms.**

The studies that are classified under these groups have been listed below:

Table 14: List of FOR Studies conducted in the past 5 years

Sector Reforms
• Roll out Plan for Introduction of Competition in Retail Sale of Electricity (2016) • FOR study on "Providing 24x7 Power Supply" (2014) • Introducing Competition in Retail Electricity Supply in India (2013) • Impact Assessment of Plan Assistance to the Forum of Regulators by the Ministry of Power during the 11th Plan (2013)
Technical performance
• Best Practices and Strategies for Distribution Loss Reduction (2016) • Study on Performance of Distribution Utilities (2016)

• Framework for a national scheme for feeder segregation of rural & agricultural consumers & suggest measures on effective metering (2014) • Assessment of component-wise AT&C losses for the State of Maharashtra (2014) • Assessment of component-wise AT&C losses for the State of Karnataka (2014) • Assessment of component-wise AT&C losses for the State of Madhya Pradesh (2014) • Component wise AT&C losses reduction study in the State of Rajasthan (2013) • Component wise AT&C losses reduction study in the State of Tamil Nadu (2013) • Component wise AT&C losses reduction study in the State of Uttar Pradesh (2013)
Commercial performance and tariff reforms
• Road map for reduction in cross subsidy (2015) • Study on Performance of Distribution Utilities (2016)
Promotion of consumer interests
• Review of functioning of CGRF and Ombudsman (2016) • Standardization of Electricity Bill (2015)
Promotion of DSM, renewable energy and other reforms
• Policy and Regulatory Interventions to Support Community Level Off-Grid Projects (2012) • Preparing Incentive Structure for States for fullfilling Renewable purchase obligation targets (2012) • Report on Green Energy Corridors (2012)

Each category of Studies will thus be evaluated with the help of one survey.

Categorization of Capacity Building Programs

A total of 5 Capacity Building Programmes were held in the past 5 years and each will be treated separately for evaluation. Details of Capacity Building Workshops have been outlined as below:

Table 15: List of Capacity Building Programmes conducted in the past 5 years

Capacity Building Programme	Topics Covered	Location	Dates held
5th Capacity Building Programme for Officers of ERC	• Renewable Energy Resources and Economics • Renewable Energy Tariffs Regulations and Design • Off Grid Energy Access - Regulatory Issues and Experiences • Grid Integration of Renewable Energy Sources • REC Market and Regulation • Market for Energy Efficiency • Mitigation Initiatives Through Agriculture Demand Side Management • Experience with Implementing JNNSM • Low-carbon Development Path for Asia • Policy and regulations for Energy Demand Management • MSW Policy and WTE in Thailand • RE in Thailand - Policy and Implementation • Prof. Thierry Lefevre - OERC- Presentation	IIT Kanpur & Bangkok	18th-23rd October, 2012

Capacity Building Programme	Topics Covered	Location	Dates held
	• Asian Experience with Policy and Regulation for Renewable		
6th Capacity Building Programme for Officers of ERC	• Renewable Energy Resources • Renewable Energy Tariffs Regulations and Design • Grid Integration of Renewables • Renewable Energy Certificates • Wind Frorecasting • Framework for Implementing Energy Efficiency Scheme at Utility Level • Smart Grid Issues and Prospects for India • Rooftop Solar PV - Addressing Policy, Regulatory and Operational Barriers • ERCÆs Role to Enhance Power Supply Security • Development of cross-border trade • Waste-to-Energy in Thailand • RE in Thailand - Policy and Implementation	IIT Kanpur & Bangkok.	09th-14th February, 2014
7th Capacity Building Programme for Officers of ERC	• Economics of Power Markets – 2015 • REC Market in India - Issues and Prospects • Developing A Market For Energy Efficiency In India • Short Term Power Procurement and Open Access • Smart Grid Concept & Deployment • Developing Regional Power Market in South Asia – 2015 • Renewable Energy Generation Tariff Determination in Practice • Solar Rooftop - Policy, Regulation and Experience across Indian States • Legal and Regulatory Issues in the Power Sector - Recent Judgements	IIT Kanpur .	28th – 30th January, 2015
8th Capacity Building Programme for Officers of ERC	• Singapore's Electricity Industry • International Coal Market and Contracts • Models for the Electricity Sector and Comparison of Electricity Market Reforms • Energy Efficient Buildings	Singapore.	18th – 20th February, 2015
9th Capacity Building Programme for Officers of ERC	• Economics of Regulation for the Power Sector • Renewable Energy Generation Tariff Determination in Practice • Retail Competition in Electricity - Issues and Strategy • Market for Renewable Energy Certificates, Concepts, Status and Challanges • Short-term Power Procurement and Open Access • Solar Rooftop - Policy, Regulation and Experience across, Indian States • Developing a Regional Power Market in South Asia • Developments in the Coal Sector - Implications for the Power Sector • Regulation of Power Sector in Singapore - Development and Current Practices, EMA • Implementation of Retail Competition in Singapore • Forecasting of Wind and Solar Power • Power Sector Regulation / Electricity Market Evolution In Singapore/ASEAN	IIT Kanpur and Singapore	21 – 26 November, 2015

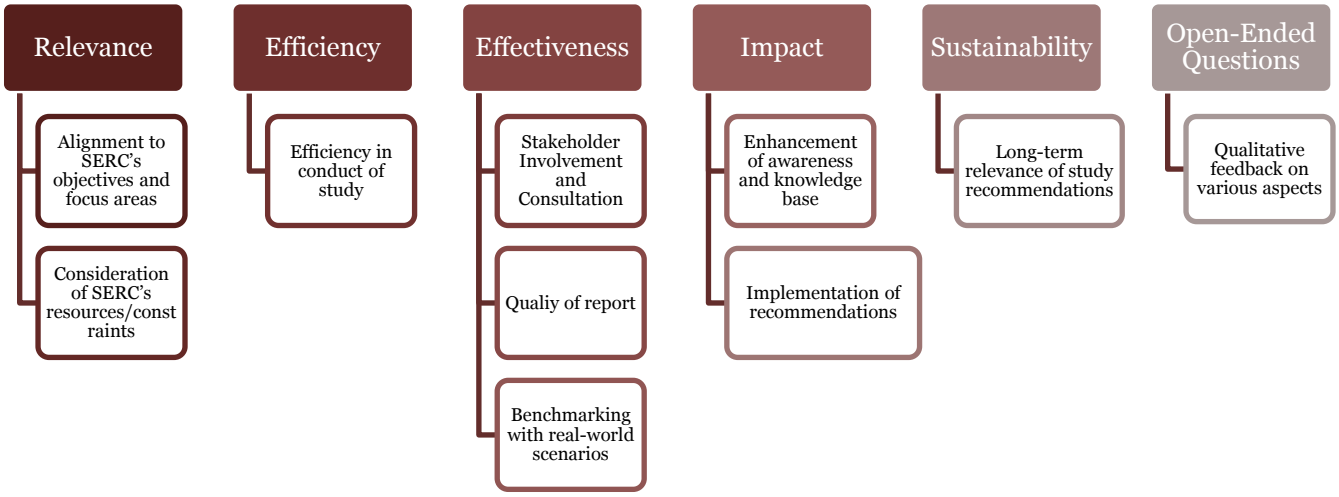
Capacity Building Programme	Topics Covered	Location	Dates held
	• Performance Standards and Monitoring in Electric Utilities, Singapore Power • Electricity Contracts and Power Market Operation in Singapore • Implementing Smart Grid Project in Singapore		

Each category of CBP will thus be evaluated with the help of one survey.

SERC personnel thus received a set of 10 surveys – 5 surveys relating to types of Studies and 5 surveys relating to each of the Capacity Building Programmes conducted in the past five years.

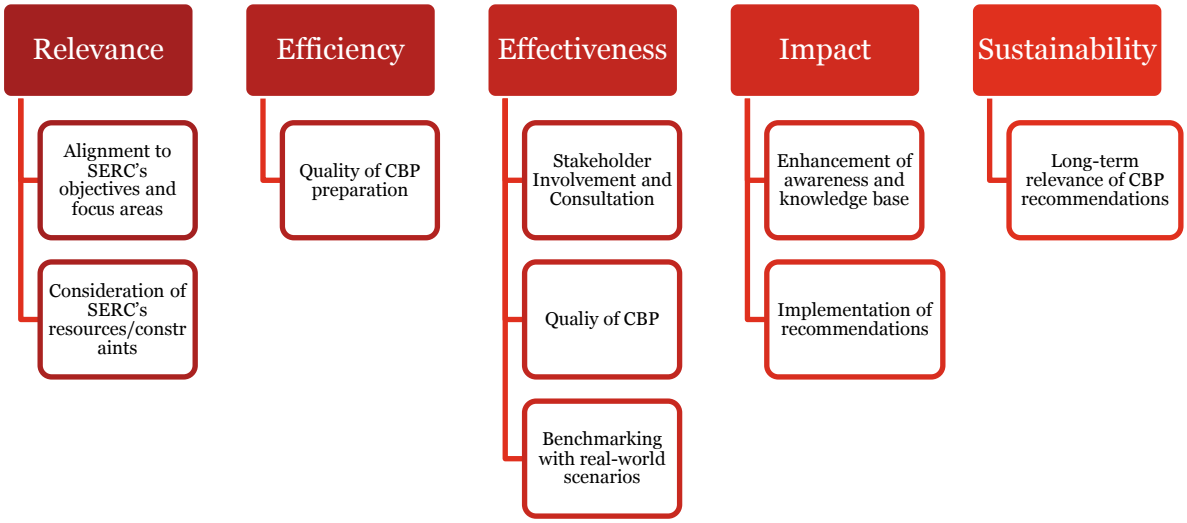
Based on our perusal and evaluation of the given ***Studies***, and in accordance with our proposed lifecycle approach for Impact Assessment (Relevance, Efficiency, Effectiveness, Impact, and Sustainability), the following broad structure of the ***Surveys for Studies*** had been outlined:

Figure 14: Initial structure of surveys for Studies



Similarly, based on our evaluation of documentation available on given Capacity Building Programs, and in accordance with our proposed lifecycle approach for Impact Assessment (Relevance, Efficiency, Effectiveness, Impact, and Sustainability), the following broad structure of the ***Surveys for CBPs*** had been outlined:

Figure 15: Initial structure of surveys for CBPs



3.3. Pilot discussions with SERCs

A pilot discussion had been conducted with JERC and MERC to gauge their initial assessment of Studies and CBPs undertaken by FOR in the last 5 years, as well as to test the validity, coverage and framing of survey questions. The given feedback has been reproduced below and grouped under the lifecycle stages of Planning, Execution and Application:

Table 16: Feedback from pilot discussions with SERCs

Planning		Execution	Application	
Relevance	Efficiency	Effectiveness	Impact	Sustainability
• State-specific implementation challenges and constraints of SERCs may be considered before conducting Studies and CBPs • Many studies forwarded (from many sources including FOR) are not always relevant to the prevailing conditions in our regions • Greater context may be provided before asking for inputs and data • SERCs may be adequately involved in determining the topics of Studies and CBPs for greater engagement and influence on study findings • Involvement of model states is crucial; their insights will be useful in planning stage	• Improving communication with SERCs for informing about Studies and CBPs • Setting strict timelines for implementation of Studies and CBPs • Timing of Studies and CBPs to complement SERCs in taking the recommendations forwards in the same FY • Involvement of Members of SERCs limited	• Comparative analysis with model states like Gujarat and Maharashtra should be essential to Studies and CBPs • A roadmap for planning the financing outgo and implementation of recommendations may be essential to Studies and CBPs • Report structures can be standardized to ensure coverage of all important aspects • Reports should be more oriented towards regulator concerns • Greater focus can be given to induction of new technologies, as well as automation of processes for all relevant studies and CBPs	• While inputs/data are sought for the execution of a Study, involvement in the review of analysis and recommendations in the Study is limited • A central coordinator may aid SERCs in adopting recommendations of Studies and CBPs in the longer run • Union territories are well suited to implement new reforms, and should thus be actively considered in recommendations and roadmaps • There should be proactive exchange of ideas both during and after conduct of studies and CBPs – can be done in organized meetings/CBPs or an online portal; select meetings may also involve discoms	• A feedback mechanism may be created for SERCs to seek further inputs, or revisions in existing studies or planned CBPs; current mechanism if arbitrary/informal • A new vision should be framed to allow SERCs to participate actively in FOR studies and make it a 'center of excellence' for utilities across the greater Asian regions • A framework can be created to hold SERCs also accountable for failing to push critical/ common issues, such as licensing of railways/ports etc.

The concerns/inputs provided by these SERCs and FOR had thus been considered in the framing of surveys.

3.4. Discussions with FOR Secretariat

In accordance with successive discussions with FOR Secretariat, surveys were finalized as per focussed discussions on Studies and CBPs, previous feedback from SERCs on CBPs, secondary research on Studies and

CBPs, pilot discussions with select SERCs, and proposed approach to impact assessment (Lifecycle approach based on OECD-DAC Principles: Relevance, Efficiency, Effectiveness, Impact, Sustainability). Inputs regarding framing and number of questions in the surveys were received and were duly incorporated.

3.5. Finalized parameters for Studies and CBPs

Subsequent to discussions with select SERCs and FOR Secretariat, the following parameters were finalized for Studies and CBPs. In addition to the finalized parameters, an overall parameter was also included so that the overall perception of each Evaluation Criteria is evaluated.

Table 17: Parameters for Studies

Relevance	Efficiency	Effectiveness	Impact	Sustainability
Relevance of Topics	Time Allocation to Studies	Involvement for Content	Increase in Awareness	Requirement of FOR Interventions
Involvement for Topics	Timely Communication from FOR	SERCs Review of Studies	Enhancing Global View	Withstanding future challenges
Relevance to SERC Issues	Overall Efficiency	Including Stakeholder Concerns	Enhancing National View	Overall Sustainability
Consideration of Resources		Quality of Analysis, Quality of Research	Contribution to Regulations	
Relevance to SERC Challenges		Feasibility of Study	Contribution to Issue Resolution	
Overall Relevance		State Suitability	Overall Impact	
		Cost Effectiveness, Technology		
		Report Structure & Clarity		
		Including International Cases		
		Including National Cases		
		Overall Effectiveness		

Table 18: Parameters for CBPs

Relevance	Efficiency	Effectiveness	Impact	Sustainability
Relevance of Topics	Quality of CBP arrangement	SERCs Involvement	Increase in Awareness	Requirement of FOR Interventions
Involvement for Topics	Structuring and Scheduling	Stakeholder Concerns	Enhancing Global View	Withstanding future challenges
Relevance to SERC Issues	Suitability of attendees	Content Coverage	Enhancing National View	Overall Sustainability
Consideration of Resources	Suitability of speakers	Feasibility of Recommendations	Contribution to Regulations	
Relevance to SERC Challenges	Adequate prior information	State Suitability of Recommendations	Contribution to Issue Resolution	
Overall Relevance	Quality of training material	Cost effectiveness	Overall Impact	
	Partner Performance	Technology Incorporation		
	Overall Efficiency	Quality of Presentations		
		Time for Discussions		
		Including National Cases		
		Overall Effectiveness		

The given parameters were converted into questions for the purpose of designing surveys for SERCs. The process of design of surveys has been elaborated in the following section.

4. Surveys for Impact Assessment of Studies and Capacity Building Programs

4.1. Principles for designing of surveys

Type of questionnaire/survey

The first part of the survey is based on a descriptive research framework, with pre-defined categories of questions. This allows us to measure the significance of our results on the overall sample of respondents. However, the survey questions have been structured in a manner that will also allow correlational and regression analysis between variables to analyse their relationship.

The second part of the survey is exploratory in nature, with a set of qualitative and open-ended questions meant to capture information not captured in the quantitative section or for capturing reasons for given responses.

Scaling of questions

All questions in the first part of the survey are rated on a 5-point Likert scale, with 1 signifying highest level of disagreement, 5 signifying highest level of agreement, and 3 signifying neither agreement nor disagreement with a question. Unlike a semantic differential scale, the Likert scale helps us capture the intensity of agreement or disagreement that the recipient holds with the question, with a provision for a neutral answer as well. An explanation accompanied each option to aid the recipient in choosing the suitable option.

Length and number of questionnaires/surveys

A questionnaire has been provided for each type of study and for each CBP to ensure that:

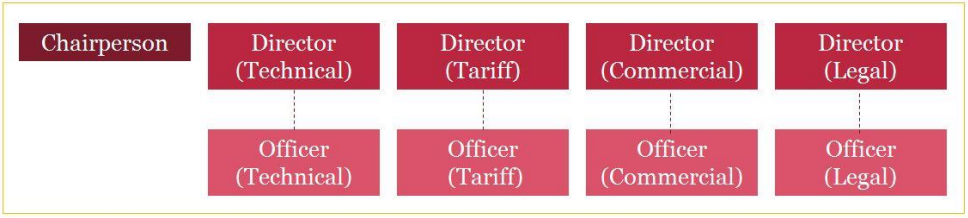
- Impact of specific types of studies or CBPs is captured, instead of the overall quality and influence of all studies and CBPs conducted over a period of 5 years
- It aids respondents in greater recall of the quality and impact of specific studies and CBPs
- Respondents who have not participated in certain CBPs or joined SERCs after the incorporation of a study may choose to skip the corresponding questionnaire
- Qualitative responses can be provided by the respondents for a specific type of study or workshop

Each respondent was sent a set of 10 surveys (5 surveys for 5 categories of studies, 5 surveys for 5 CBPs).

Respondents for the questionnaire/survey

The questionnaires for assessing the broad parameters of Relevance, Efficiency, Effectiveness, Impact and Sustainability for Studies and CBPs was sent to each of the 29 ERCs and was targeted at the following personnel:

- Chairperson
- Three of any four Directors for the verticals of Technical, Tariff, Commercial and Legal expertise
- Corresponding Officers for the three verticals



The survey would thus be able to cover the perspective of three levels of management and execution, as well as encourage other levels of SERCs to actively participate in future studies, provide feedback and revisit all relevant FOR studies and workshops previously conducted by FOR.

Flexibility of filling questionnaires/surveys

Flexibility was provided in the quantitative surveys to provide inputs pertinent to specific types of study/ specific CBP. This allowed any variation in perception for different classes of studies/CBPs to be captured, and also allowed SERC personnel who have participated in specific studies/CBPs to give their due inputs accordingly.

The survey also allowed respondents to provide qualitative inputs with regards to Studies/CBPs, which was used in conjunction with data analysis to arrive at recommendations and roadmap in this study.

Mode of filling questionnaires/surveys

Surveys were designed on Google Survey tool and hosted on the website of the Forum of Regulators. This allowed automatic collection of data in the linked database that was available for access by the Forum of Regulators for perusal and analysis. Links to the surveys were thereafter sent to SERCs and FOR to be filled up in a stipulated amount of time.

4.2. Survey for Impact Assessment of Studies

Name: _____

Designation: _____

Name of Electricity Regulatory Commission: _____

Relevance of Studies

Relevance: Alignment to SERC's objectives and focus areas

1. Were the topics of the studies relevant to the functions of the SERC?					
1- Very Low or No Relevance	2-Low Relevance	3-Moderate Relevance	4-High Relevance	5-Very High Relevance	Not Applicable

2. What was the level of involvement of the SERC in selecting the topics of the studies?					
1- Very Low or No Involvement	2-Low Involvement	3-Moderate Involvement	4-High Involvement	5-Very High Involvement	Not Applicable

3. Were the topics of the studies relevant to the crucial issues/challenges being faced by the SERC?					
1- Very Low or No Relevance	2-Low Relevance	3-Moderate Relevance	4-High Relevance	5-Very High Relevance	Not Applicable

Feasibility: Consideration of SERC's resources/constraints

4. Were the SERC's resources/constraints considered before setting of topics of the studies?					
1- Very Low or No Consideration	2-Low Consideration	3-Moderate Consideration	4-High Consideration	5-Very High Consideration	Not Applicable

5. Were the implementation challenges of the state considered before setting of topics of the studies? (socio-economic considerations, technical challenges, reliability of data, timelines for issue of Order)					
1- Very Low or No Consideration	2-Low Consideration	3-Moderate Consideration	4-High Consideration	5-Very High Consideration	Not Applicable
6. Please rate the overall relevance of the study to the goals and functions of the SERC.					
1- Very Low or No Relevance	2-Low Relevance	3-Moderate Relevance	4-High Relevance	5-Very High Relevance	Not Applicable

Efficiency

Efficiency in conduct of studies

7. Was the time allocated to the execution of the studies adequate?					
1- Very less time OR Very long time allocated to execution of most studies	2-Lesser time than necessary OR Longer time then necessary allocated to execution of most studies	3-Only a few studies were allocated appropriate amount of time for execution	4- Most studies were allocated appropriate amount of time for execution	5- All studies were allocated appropriate amount of time for execution	Not Applicable

8. Did FOR communicate/seek inputs and feedback from the SERC for the execution of the studies in a timely manner?					
1- Very Low or No communication in a timely manner	2- Very little communication in a timely manner	3- Only some of the communication in a timely manner	4- Most of the communication in a timely manner	5- All communication in a timely manner	Not Applicable

9. ***Please rate the overall efficiency in conducting Studies.***					
1- Very Low or No Efficiency	2- Low Efficiency	3- Moderate Efficiency	4- High Efficiency	5- Very High Efficiency	Not Applicable

Execution of the Studies

Effectiveness

Stakeholder Involvement and Consultation

10. What was the level of involvement of the SERC in providing inputs for preparation of the studies' content?					
1- Very Low or No Involvement	2-Low Involvement	3-Moderate Involvement	4-High Involvement	5-Very High Involvement	Not Applicable
11. What was the extent/amount of feedback sought by FOR from the SERC for review and finalization of studies?					
1- Very Low or No feedback sought	2-Low extent/amount of feedback	3-Moderate extent/amount of feedback	4-High extent/amount of feedback	5-Very High extent/amount of feedback	Not Applicable

12. Were the concerns of all relevant stakeholders adequately addressed in the recommendations provided in the studies?					
1- Concerns of stakeholders not addressed	2-Concerns of stakeholders not addressed adequately	3- Concerns of few stakeholders addressed adequately	4- Concerns of most stakeholders addressed adequately	5- Concerns of all stakeholders addressed adequately	Not Applicable

Quality of report

13. How would you rate the quality of analysis and insights in the studies?					
1- Poor/ Unsatisfactory	2- Average /Needs Improvement	3- Acceptable/ Satisfactory	4- High Quality	5- Very High Quality	Not Applicable

14. How would you rate the quality of research methodology adopted in the studies?					
1- Poor/ Unsatisfactory	2- Average /Needs Improvement	3- Acceptable/ Satisfactory	4- High Quality	5- Very High Quality	Not Applicable

15. Were the studies' recommendations feasible for implementation?					
1- Very Low or No feasibility	2-Low feasibility	3- Moderate feasibility	4- High feasibility	5- Very high feasibility	Not Applicable

16. Were the studies' recommendations suitable to state-specific challenges?					
1- Very Low or No suitability	2-Low suitability	3- Moderate suitability	4- High suitability	5- Very high suitability	Not Applicable

17. Were the studies' recommendations cost-effective?					
1- Very Low or No Cost Effectiveness	2- Low Cost Effectiveness	3- Moderate Cost Effectiveness	4- High Cost Effectiveness	5- Very High Cost Effectiveness	Not Applicable
18. Did the studies' recommendations incorporate state-of-the-art technologies or innovations?					
1- Very Low or No Incorporation	2- Low Incorporation	3- Moderate Incorporation	4- High Incorporation	5- Very High Incorporation	Not Applicable

19. How would you rate the clarity, structure, and presentation of the study reports?					
1- Poor/ Unsatisfactory	2- Average /Needs Improvement	3- Acceptable/ Satisfactory	4- High Quality	5- Very High Quality	Not Applicable

Benchmarking with real-world scenarios

20. How would you rate the incorporation of international case studies and best practices in strengthening the quality of analysis and recommendations in the studies?					
1- Very Low or No Incorporation	2- Low Incorporation	3- Moderate Incorporation	4- High Incorporation	5- Very High Incorporation	Not Applicable
21. How would rate the incorporation of national and state-specific case studies in highlighting prevalent					

issues in the studies?					
1- Very Low or No Incorporation	2- Low Incorporation	3- Moderate Incorporation	4- High Incorporation	5- Very High Incorporation	Not Applicable

22. Please rate the overall effectiveness of the studies in contributing to the functions and goals of the SERC.					
1- Very Low or No Effectiveness	2- Low Effectiveness	3- Moderate Effectiveness	4- High Effectiveness	5- Very High Effectiveness	Not Applicable

Application of the Studies

Impact

Enhancement of awareness and knowledge base

23. Did the studies contribute in creating awareness and enhancing the knowledge base of SERC members?					
1- Very Low or No Contribution	2- Low Contribution	3- Moderate Contribution	4- High Contribution	5- Very High Contribution	Not Applicable

24. Did the studies contribute in providing a global viewpoint of the issues addressed?					
1- Very Low or No Contribution	2- Low Contribution	3- Moderate Contribution	4- High Contribution	5- Very High Contribution	Not Applicable

25. Did the studies contribute in providing a national viewpoint of the issues addressed?					
1- Very Low or No Contribution	2- Low Contribution	3- Moderate Contribution	4- High Contribution	5- Very High Contribution	Not Applicable

Implementation of recommendations

26. Did the studies contribute to formulation of subsequent regulations/orders/ guidelines/concept papers?					
1- Very Low or No Contribution	2- Low Contribution	3- Moderate Contribution	4- High Contribution	5- Very High Contribution	Not Applicable

27. Did the studies contribute to actual resolution of prevalent issues in the state?					
1- Very Low or No Contribution	2- Low Contribution	3- Moderate Contribution	4- High Contribution	5- Very High Contribution	Not Applicable

28. Please rate the overall impact of the study on fulfillment of goals of the SERC.					
1- Very Low or No Impact	2- Low Impact	3- Moderate Impact	4- High Impact	5- Very High Impact	Not Applicable

Sustainability

Long-term relevance of study recommendations

29. Would the SERCs require further support or intervention from FOR for implementation of the studies?					
1- Significantly high support required	2- Considerable support required	3- Moderate support required	4- Slight support required	5- No support required	Not Applicable

30. Can the recommendations of the studies withstand practical challenges in the future? (Challenges may be political/socio-economic/environmental/financial/regulatory/technological in nature)					
1- Recommendations cannot withstand future challenges	2- Most recommendations cannot withstand future challenges	3- Only a few recommendations can withstand risks certain future challenges	4- Most recommendations can withstand future certain challenges	5- Most recommendations can withstand majority of future challenges	Not Applicable

31. Please rate the overall sustainability of the study for the next 3-5 years.					
1- Very Low or no sustainability	2- Low degree of sustainability	3- Moderate degree of sustainability	4- High degree of sustainability	5- Very high degree of sustainability	Not Applicable

Open Ended Questions:

1. Are you satisfied with the extent of your involvement over the entire period of studies' execution?
2. How could you involvement in execution of studies be improved (from conceptualization of topics to execution)?
3. Were the study recommendations forward-looking and can remain valid for a period of 3-5 years?
4. Would you like to provide any suggestions to improve the quality of studies conducted by FOR in the future?
5. Would you like to provide any suggestions for making studies easier to adopt and implement for your state?
6. Would you like to cite any initiatives/steps taken by your state in furthering the recommendations of the studies?
7. Are there any relevant issues or concerns that have not been highlighted in the given survey?

4.3. Survey for Impact Assessment of CBPs

Name: _____

Designation: _____

Name of Electricity Regulatory Commission: _____

Planning of the CBPs

Relevance

Relevance: Alignment to SERC's objectives and focus areas

1. Were the topics of the CBP relevant to the functions of the SERC?					
1- Very Low or No Relevance	2-Low Relevance	3-Moderate Relevance	4-High Relevance	5-Very High Relevance	Not Applicable

2. What was the level of involvement of the SERC in selecting the topics of the CBP?					
1- Very Low or No Involvement	2-Low Involvement	3-Moderate Involvement	4-High Involvement	5-Very High Involvement	Not Applicable

3. Were the topics of the CBP relevant to the crucial issues/challenges being faced by the SERC?					
1- Very Low or No Relevance	2-Low Relevance	3-Moderate Relevance	4-High Relevance	5-Very High Relevance	Not Applicable

Feasibility: Consideration of SERC's resources/constraints

4. Were the SERC's resources/constraints considered before setting of topics of the CBP?					
1- Very Low or No Consideration	2-Low Consideration	3-Moderate Consideration	4-High Consideration	5-Very High Consideration	Not Applicable

5. Were the implementation challenges of the state considered before setting of topics of the CBP? (socio-economic considerations, technical challenges, reliability of data, timelines for issue of Order)					
1- Very Low or No Consideration	2-Low Consideration	3-Moderate Consideration	4-High Consideration	5-Very High Consideration	Not Applicable

6. Please rate the overall relevance of the CBP to the goals and functions of the SERC.					
1- Very Low or No	2-Low Relevance	3-Moderate	4-High Relevance	5-Very High	Not Applicable

Relevance		Relevance		Relevance	

Efficiency

Quality of CBP preparation

7. How would you rate the quality of coordination and logistical arrangements for organization of the CBP?					
1- Poor/ Unsatisfactory	2- Average /Needs Improvement	3- Acceptable/ Satisfactory	4- High Quality	5- Very High Quality	Not Applicable

8. Was the time allocated to the CBP optimally scheduled and structured?					
1- Very less time OR Very long time allocated to execution of CBP	2-Lesser time than necessary OR Longer time then necessary allocated to execution of CBP	3-Only a few topics were allocated appropriate amount of time for execution	4- Most topics were allocated appropriate amount of time for execution	5- All topics were allocated appropriate amount of time for execution	Not Applicable

9. Was the right type of audience sought for the CBP?					
1- Very Low or No Relevance	2-Low Relevance	3-Moderate Relevance	4-High Relevance	5-Very High Relevance	Not Applicable

10. How would you rate the suitability of speakers for the selected topics at the CBP?					
1- Very Low or No suitability	2-Low suitability	3- Moderate suitability	4- High suitability	5- Very high suitability	Not Applicable
11. Were you adequately informed of the topics to be discussed at the CBP? (and material provided in advance as applicable)					
1- Not Informed	2- Informed of overall agenda only	3- Informed of key topics to be discussed	4- Informed of all topics to be discussed and specific schedule	5- Informed of all topics and relevant material shared	Not Applicable

12. How would you rate the quality of training material provided at the CBP?					
1- Poor/ Unsatisfactory	2- Average /Needs Improvement	3- Acceptable/ Satisfactory	4- High Quality	5- Very High Quality	Not Applicable

13. How would you rate the performance of the knowledge partner in organizing the CBP?					
1- Poor/ Unsatisfactory	2- Average /Needs Improvement	3- Acceptable/ Satisfactory	4- High Quality	5- Very High Quality	Not Applicable

14. ***Please rate the overall efficiency in organization and conduct of CBPs.***					
1- Very Low or No Efficiency	2- Low Efficiency	3- Moderate Efficiency	4- High Efficiency	5- Very High Efficiency	Not Applicable

Execution of the CBPs

Effectiveness

Stakeholder Involvement and Consultation

15. What was the level of involvement of the SERC in providing inputs for preparation of the CBP presentation/training material?					
1- Very Low or No Involvement	2-Low Involvement	3-Moderate Involvement	4-High Involvement	5-Very High Involvement	Not Applicable

16. Were the concerns of all relevant stakeholders adequately addressed in the recommendations provided in the CBP?					
1- Concerns of stakeholders not addressed	2-Concerns of stakeholders not addressed adequately	3- Concerns of few stakeholders addressed adequately	4- Concerns of most stakeholders addressed adequately	5- Concerns of all stakeholders addressed adequately	Not Applicable

Quality of CBP

17. How would you rate the coverage of relevant content in the CBP?					
1- Poor/ Unsatisfactory	2- Average /Needs Improvement	3- Acceptable/ Satisfactory	4- High Quality	5- Very High Quality	Not Applicable

18. Were the CBP recommendations feasible for implementation?					
1- Very Low or No feasibility	2-Low feasibility	3- Moderate feasibility	4- High feasibility	5- Very high feasibility	Not Applicable

19. Were the CBP recommendations suitable to state-specific challenges?					
1- Very Low or No suitability	2-Low suitability	3- Moderate suitability	4- High suitability	5- Very high suitability	Not Applicable

20. Were the CBP recommendations cost-effective?					
1- Very Low or No Cost Effectiveness	2- Low Cost Effectiveness	3- Moderate Cost Effectiveness	4- High Cost Effectiveness	5- Very High Cost Effectiveness	Not Applicable

21. Did the CBP recommendations incorporate state-of-the-art technologies or innovations?					
1- Very Low or No Incorporation	2- Low Incorporation	3- Moderate Incorporation	4- High Incorporation	5- Very High Incorporation	Not Applicable

22. How would you rate the clarity, structure, and presentation of the CBP presentation/training material?					
1- Poor/ Unsatisfactory	2- Average /Needs Improvement	3- Acceptable/ Satisfactory	4- High Quality	5- Very High Quality	Not Applicable

23. How would you rate the time allocated for discussions/brainstorming by SERCs?					
1- No facilitation for discussions/no time given	2- Very little facilitation for discussions/very little time given	3- Acceptable facilitation for discussions/time given	4- Adequate facilitation for discussions/ adequate time given	5- Excellent facilitation for discussions/long time given	Not Applicable

Benchmarking with real-world scenarios

24. How would you rate the incorporation of international case studies and best practices in strengthening the quality of analysis and recommendations in the CBP?					
1- Very Low or No Incorporation	2- Low Incorporation	3- Moderate Incorporation	4- High Incorporation	5- Very High Incorporation	Not Applicable

25. How would rate the incorporation of national and state-specific case studies in highlighting prevalent issues in the CBP?					
1- Very Low or No Incorporation	2- Low Incorporation	3- Moderate Incorporation	4- High Incorporation	5- Very High Incorporation	Not Applicable

26. Please rate the overall effectiveness of the CBP in contributing to the functions and goals of the SERC.					
1- Very Low or No Effectiveness	2- Low Effectiveness	3- Moderate Effectiveness	4- High Effectiveness	5- Very High Effectiveness	Not Applicable

Application of the CBPs

Impact

Enhancement of awareness and knowledge base

27. Did the CBP contribute in creating awareness and enhancing the knowledge base of SERC members?					
1- Very Low or No Contribution	2- Low Contribution	3- Moderate Contribution	4- High Contribution	5- Very High Contribution	Not Applicable

28. Did the CBP contribute in providing a global viewpoint of the issues addressed?					
1- Very Low or No Contribution	2- Low Contribution	3- Moderate Contribution	4- High Contribution	5- Very High Contribution	Not Applicable

29. Did the CBP contribute in providing a national viewpoint of the issues addressed?					
1- Very Low or No Contribution	2- Low Contribution	3- Moderate Contribution	4- High Contribution	5- Very High Contribution	Not Applicable

Implementation of recommendations

30. Did the CBP contribute to formulation of subsequent regulations/orders/ guidelines/concept papers?					
1- Very Low or No Contribution	2- Low Contribution	3- Moderate Contribution	4- High Contribution	5- Very High Contribution	Not Applicable

31. Did the CBP contribute to actual resolution of prevalent issues in the state?					
1- Very Low or No Contribution	2- Low Contribution	3- Moderate Contribution	4- High Contribution	5- Very High Contribution	Not Applicable

32. Please rate the overall impact of the CBP on fulfillment of goals of the SERC.					
1- Very Low or No Impact	2- Low Impact	3- Moderate Impact	4- High Impact	5- Very High Impact	Not Applicable

Sustainability

Long-term relevance of CBP recommendations

33. Would the SERCs require further support or intervention from FOR for implementation of the CBP recommendations?					
1- Significantly high support	2- Considerable support required	3- Moderate support required	4- Slight support required	5- No support required	Not Applicable

required					

34. Can the recommendations of the studies withstand practical challenges in the future? (Challenges could be political/socio-economic/environmental/financial/regulatory/technological in nature)					
1- Recommendations cannot withstand future challenges	2- Most recommendations cannot withstand future challenges	3- Only a few recommendations can withstand risks certain future challenges	4- Most recommendations can withstand future certain challenges	5- Most recommendations can withstand majority of future challenges	Not Applicable

35. Please rate the overall sustainability of the CBP for the next 3-5 years.					
1- Very Low or no sustainability	2- Low degree of sustainability	3- Moderate degree of sustainability	4- High degree of sustainability	5- Very high degree of sustainability	Not Applicable

5. Analysis of Responses – Studies

5.1. Profile of Responses

A total of 103 responses were received for Studies conducted by FOR from 33 respondents across 19 SERCs. A summary of the profile of responses is given below, while the complete list of respondents is provided in Annexure 1.1.

Table 19: Profile of Responses - FOR Studies

Particulars	Number of respondents	Number of responses
Total	33	103
For each type of study		
Commercial	17	17
Technical	21	21
Consumer	20	20
Renewable, DSM & Efficiency	28	28
Other Sector Reforms	17	17
For each region		
North	8	24
Central	3	11
East	5	17
North East	12	44
West	4	6
South	1	1
For each designation		
Chairman & Member	7	25
Secretary	8	31
Director & Below	18	47

As observed in the given table, a relatively similar base of responses has been gathered for each type of study. However, there was notable variation in responses received from various regions. The North-East region provided the most number of responses (44), followed by North (24) and East (17) regions, while only 6 responses recorded for West and 1 response recorded for the South region. Each designation type provided a satisfactory base of responses, allowing us to evaluate variation in responses across each.

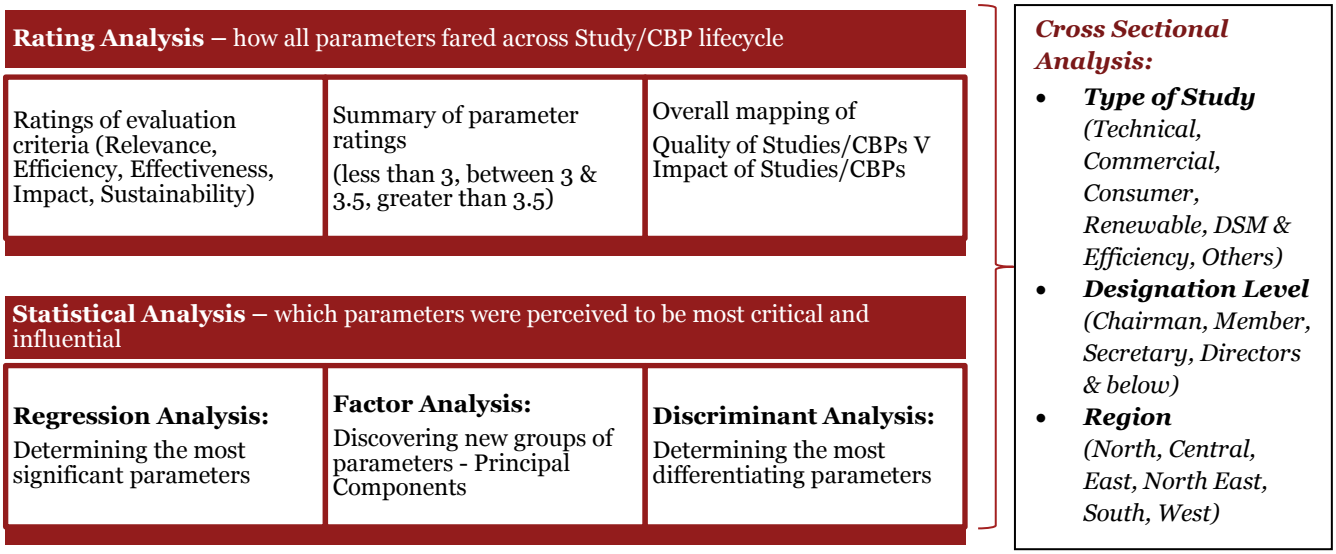
An acceptable base of responses was thus recorded for the Studies, enabling us to undertake a comprehensive analysis of the responses across the length of a study lifecycle. Also, a reasonable number of responses were recorded for different types of studies, regions and designations, allowing us to derive useful insights for each cross section.

5.2. Approach to analysis

A lifecycle approach had been chosen to determine the impact of FOR Studies and CBPs since it allows end-to-end assessment of the process and ensure that all relevant parameters are encompassed. With the help of this approach, a total of 31 parameters were tested in the form of survey questions from the respondents for FOR Studies.

To derive suitable insights from the wide variety of parameters, two types of tactics were followed: first, to analyze the ratings of all parameters comprehensively across the lifecycle of Studies and identify strengths and weaknesses, and second, to identify the most critical parameters responsible for making Studies more successful and impactful. The given tactics were thus executed with the aid of two types of analysis: Ratings analysis and Statistical Analysis, as depicted below:

Figure 16: Type of analysis undertaken – FOR Studies



For each tactic, cross-sectional analysis was also undertaken for 3 types of cross sections – Type of Study, Designation Level, and Region, to better understand the variation in responses from the different sets of respondents.

Ratings Analysis

1. **Ratings of evaluation criteria**
   - Ratings of all parameters under each Evaluation Criteria (Relevance, Efficiency, Effectiveness, Impact, Sustainability) were thoroughly assessed
   - Average ratings for all parameters within an Evaluation Criteria were determined, along with average ratings for each cross-section (Type of Study, Designation Level, and Region)
   - This analysis allows us to understand how each parameter has been distinctly perceived by the respondents
2. **Summary of parameter ratings**
   - All parameters were grouped in 3 groups: Group 1, with average rating higher than 3.5; Group 2, with average rating between 3 and 3.5; and Group 3, with average rating lesser than 3
   - This grouping informs us of which parameters have been consistently rated below par, at par and above par

3. Overall mapping of Quality of Studies V Impact of Studies

- Two broad parameters were framed to depict how well the studies were developed (Quality of Studies), and how impactful the Studies were (Impact of Studies)
- Evaluation Criteria Relevance, Efficiency and Effectiveness were combined in a 1:1:2 ratio to determine Quality of Studies and Impact and Sustainability were combined in a 1:1 ratio to determine the Impact of Studies
- This mapping allows us to visualize the standing of each type of study individually as well as relative to each other on the Quality V Impact map

Statistical Analysis

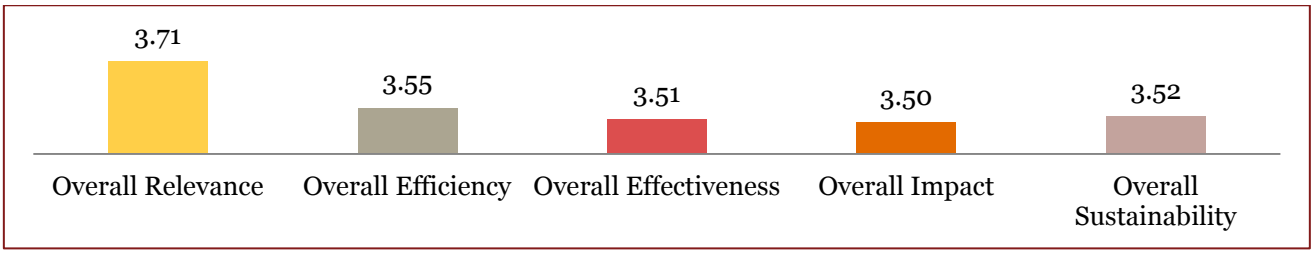
1. Determining the most significant parameters
   - Regression analysis was undertaken to identify the most significant parameters under each Evaluation Criteria which contributed to the overall rating for that Criteria
   - This enables us to shortlist parameters that respondents perceive most critical for the success of each Evaluation Criteria
2. Discovering new groups of parameters
   - Factor Analysis (Principal Components) was undertaken to identify new groups of parameters as per the proximity/similarity of response trends
   - This allows the framing of new overarching parameters that respondents perceive should encompass the larger set of initial parameters
3. Determining the most differentiating parameters
   - Discriminant Analysis was undertaken to identify parameters that most differentiate between the sets of respondents who have given different ratings for Impact and Sustainability

5.3. Ratings Analysis

To analyze the ratings of all parameters comprehensively across the lifecycle of Studies, each evaluation criteria and its underlying parameters were methodically evaluated, as outlined in the following section.

5.3.1. Assessment of each evaluation criteria

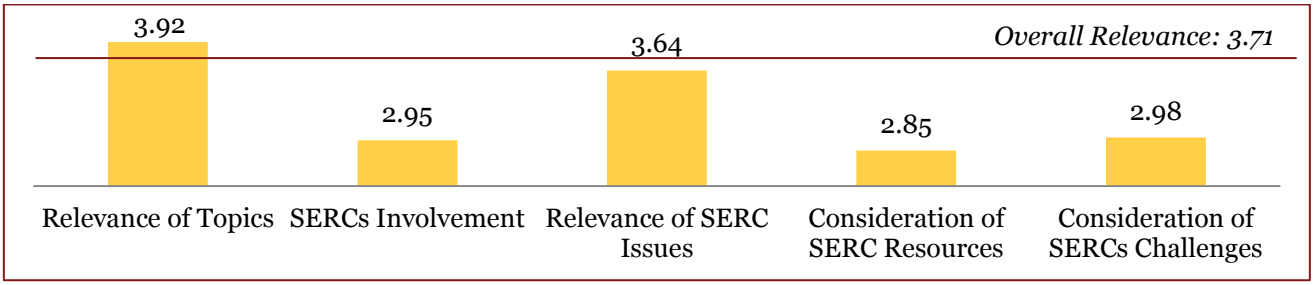
Average ratings of the parameter for testing overall success of each Evaluation Criteria have been depicted below.



As observed, the Evaluation Criteria of Relevance has been rated relatively higher than others. SERCs perceive Studies as highly relevant to the functions of SERCs and the current issues being faced by them. On an overall basis, the other Evaluation Criteria have been rated similar to each other at approximately an above par rating of 3.5. However, greater variation has been observed for the underlying parameters, described in the subsequent sections.

5.3.1.1. Relevance of Studies

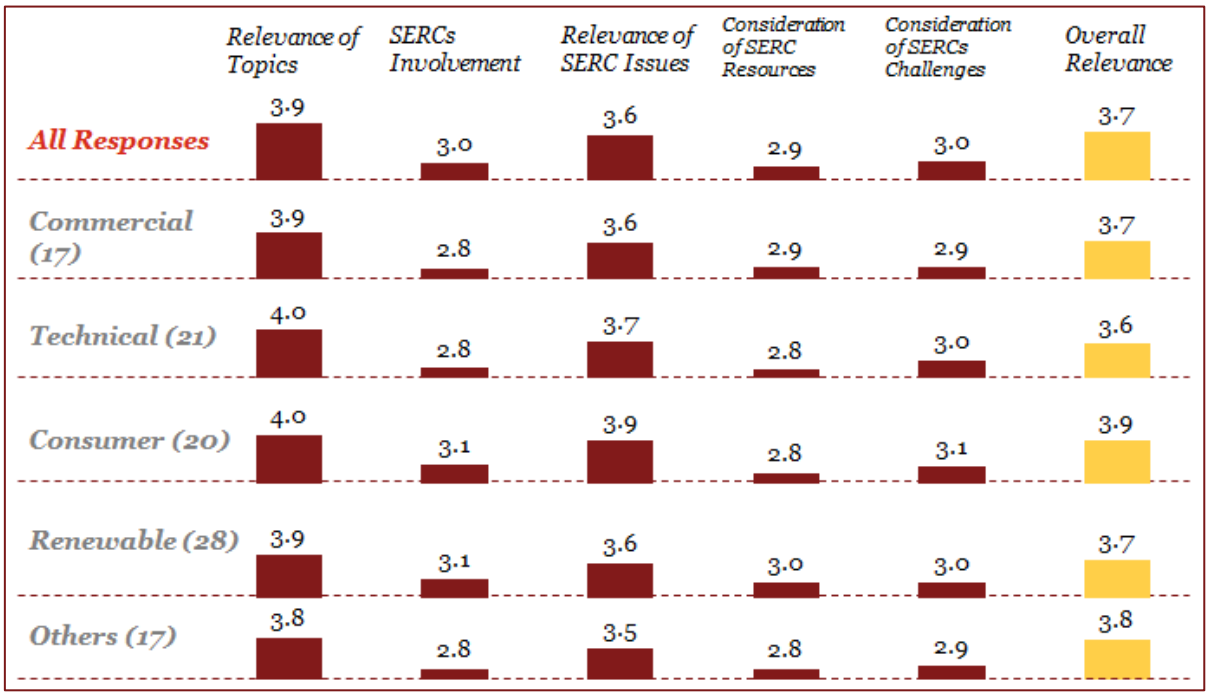
The average ratings of parameters under the Relevance Evaluation Criteria have been depicted below:



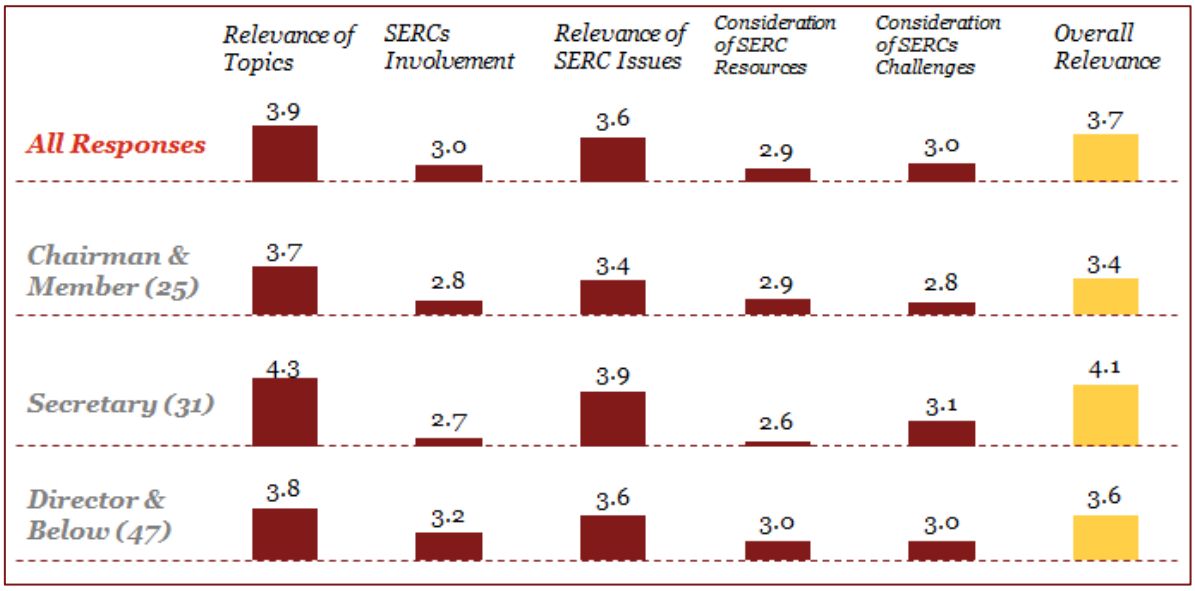
Two key observations can be made on the basis of the above depiction:

- On one hand, SERCs are satisfied with the relevance of study topics and their relation to present issues being faced by SERCs
- However, on the other hand, SERCs are less satisfied with the extent of their involvement in the planning stages of Studies (specifically, for the determination of Study topics), and perceive that consideration of state-level challenges (SERC resources and capabilities, and challenges faced by SERCs) at the planning stage is insufficient

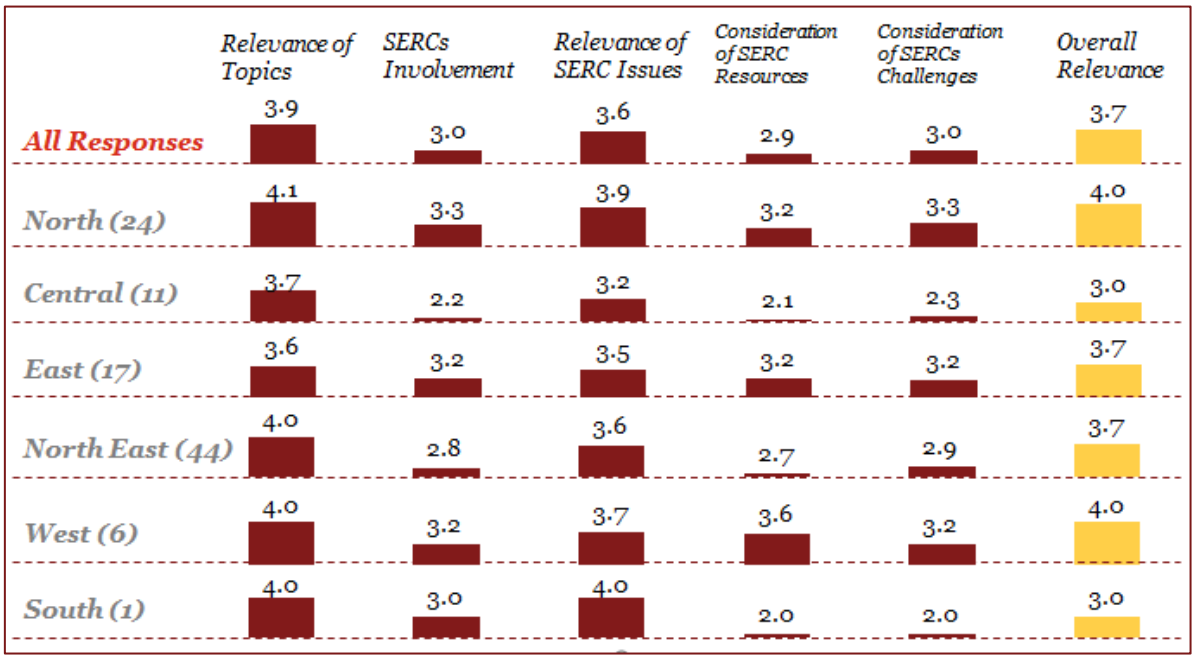
A similar trend in responses is observed when the sample set is broken down into various types of Studies, Designation Levels and Regions as depicted below:



As observed, Renewable and Consumer Studies have been perceived marginally better across various parameters, while others have been rated in a fairly similar manner. In particular, involvement of SERCs in the planning stage for Commercial, Technical and Other Sector Studies could be improved.



As observed, SERC personnel at levels Directors & below perceive themselves to be slightly more involved in planning stages than Chairman, Member and Secretary. Also, Chairman, Member and Secretary seem to be more concerned about the due consideration of SERC resources and capabilities than Directors & below. As evident, Secretaries of SERCs are most satisfied with the Evaluation Criteria of Relevance of FOR Studies.

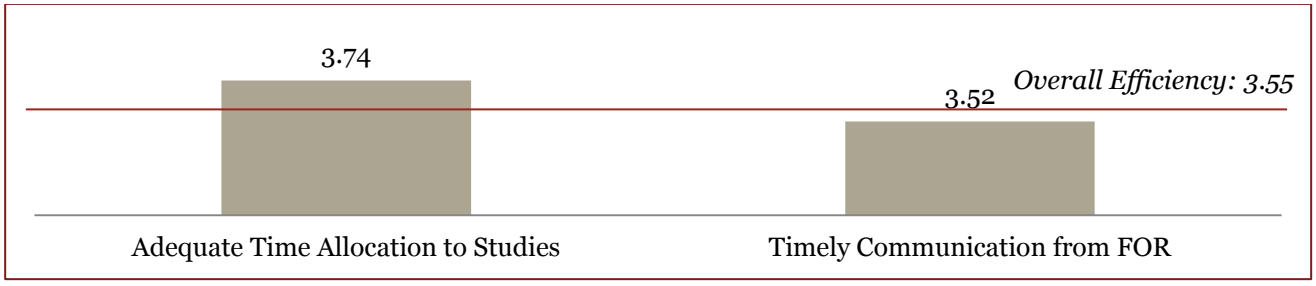


Respondents from the Central and North-Eastern states perceive themselves to be less involved than other regions in the planning stages of Studies. North, East and West regions have rated various Relevance parameters relatively higher than other regions.

As per qualitative responses, smaller states seek greater involvement in the planning stages of Studies, and would like their respective state-specific inputs to be incorporated early so that the Study is able to sufficiently reflect them across the lifecycle of the Study.

5.3.1.2. Efficiency in conduct of Studies

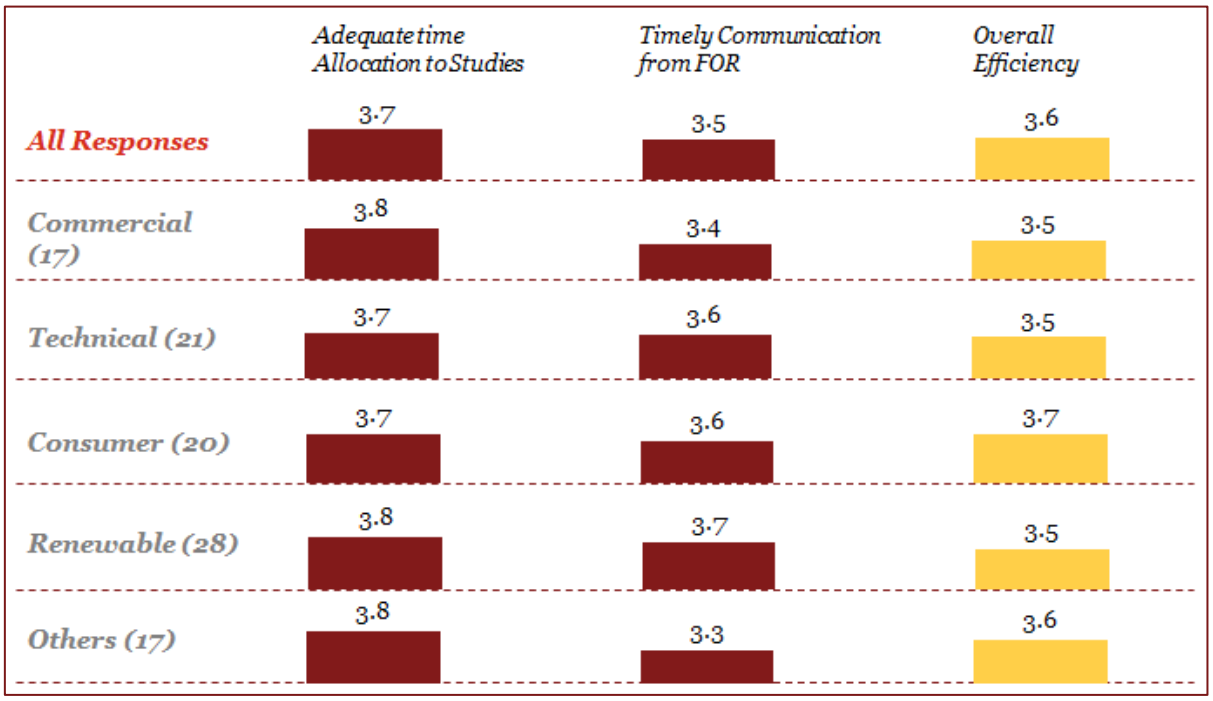
The average ratings of parameters under the Efficiency Evaluation Criteria have been depicted below:



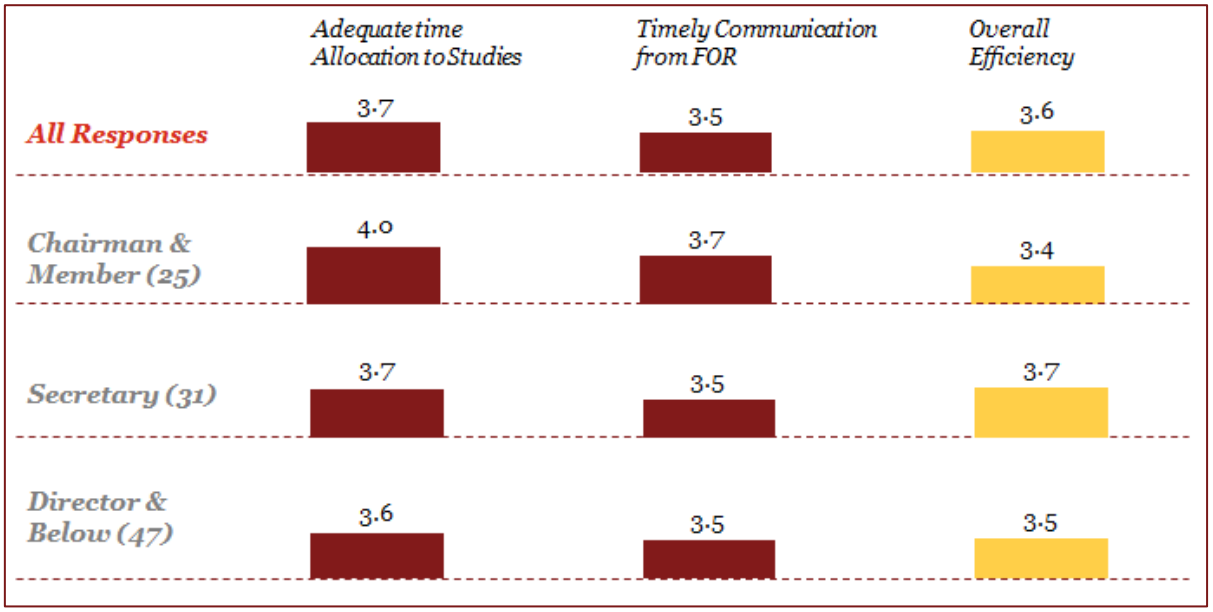
Two major parameters were tested in the form of survey questions for the purpose of assessing the Efficiency of conducting Studies:

- Allocation of adequate time for completion of Studies
- Timely Communication from FOR for seeking feedback and inputs from SERCs

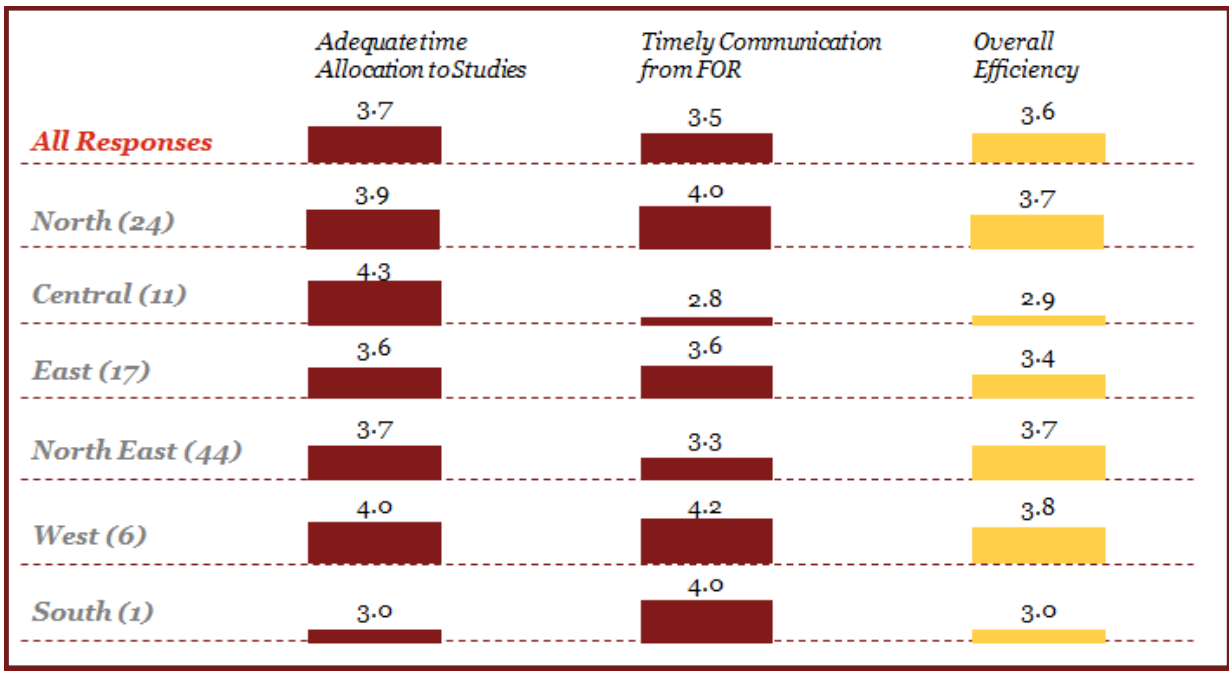
SERCs have given a relatively higher rating for the parameter of adequate allocation of time, while the rating for Timely Communication from FOR is marginally above par and similar to the rating for Overall Efficiency of conduct of Studies.



Responses for given Efficiency parameters are fairly similar for each Type of Study and rated reasonably high; however, communication from FOR for Commercial and Other Sector Studies rated marginally lower than others.



Chairman and Member have provided a higher rating for the given Efficiency parameters, while others are reasonably contented with the same.



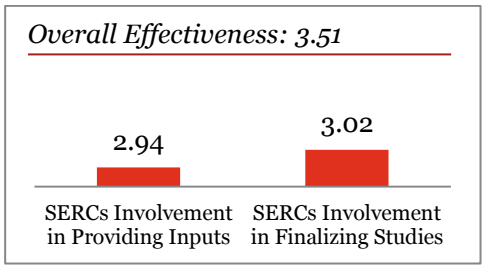
Respondents from Central and North-Eastern states seem to be less satisfied with Timely Communication from FOR for seeking of feedback and inputs, while other regions are reasonably satisfied. Most regions are satisfied with the amount of time allocated for the completion of each type of Study.

As per qualitative responses, MPERC seeks greater communication with FOR and would like its officers to be contacted and involved across the Study so that they build expertise in implementation and advocacy.

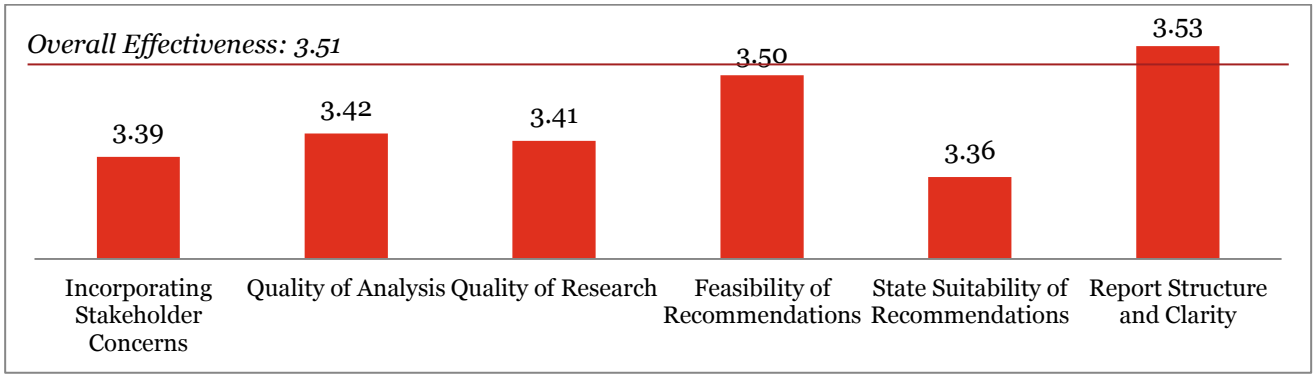
5.3.1.3. Effectiveness of Studies

The average ratings of parameters under the Effectiveness Evaluation Criteria have been depicted below. The parameters have been divided into 3 groups for greater clarity in representation:

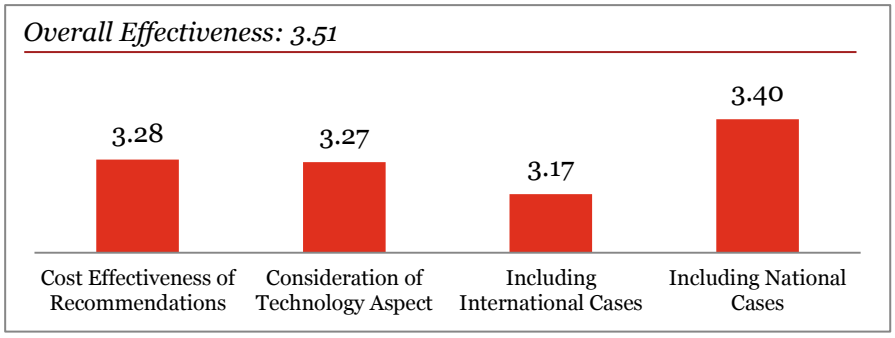
Involvement of SERCs



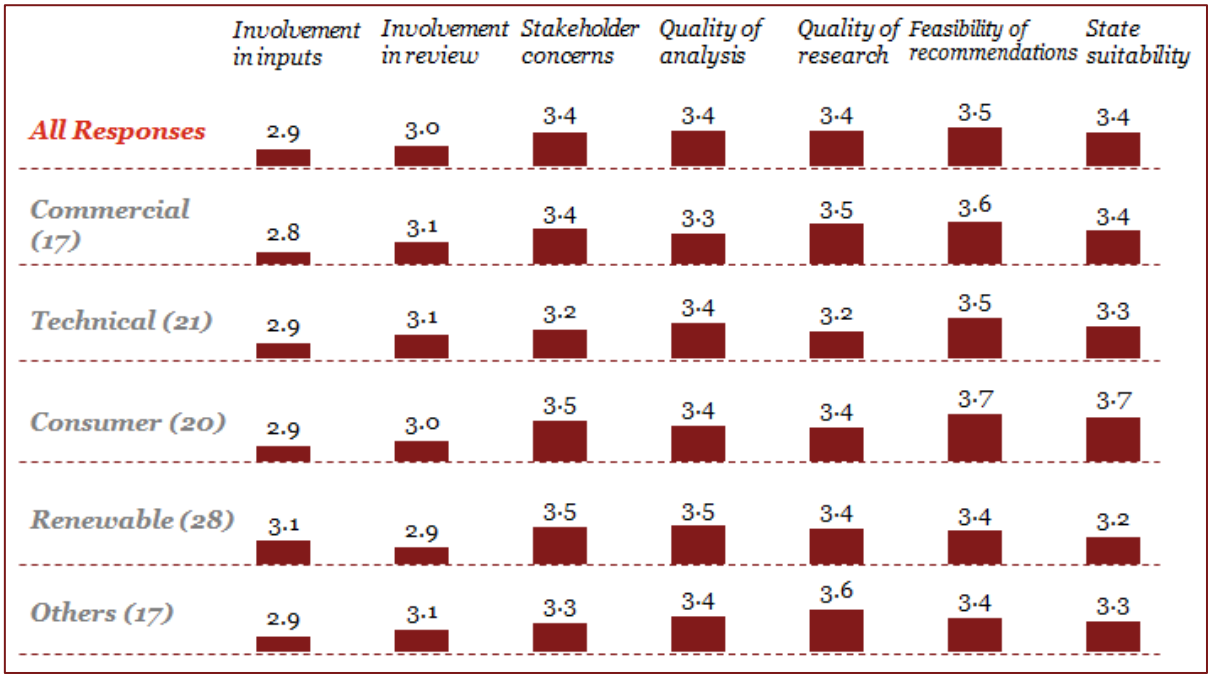
Quality of Studies

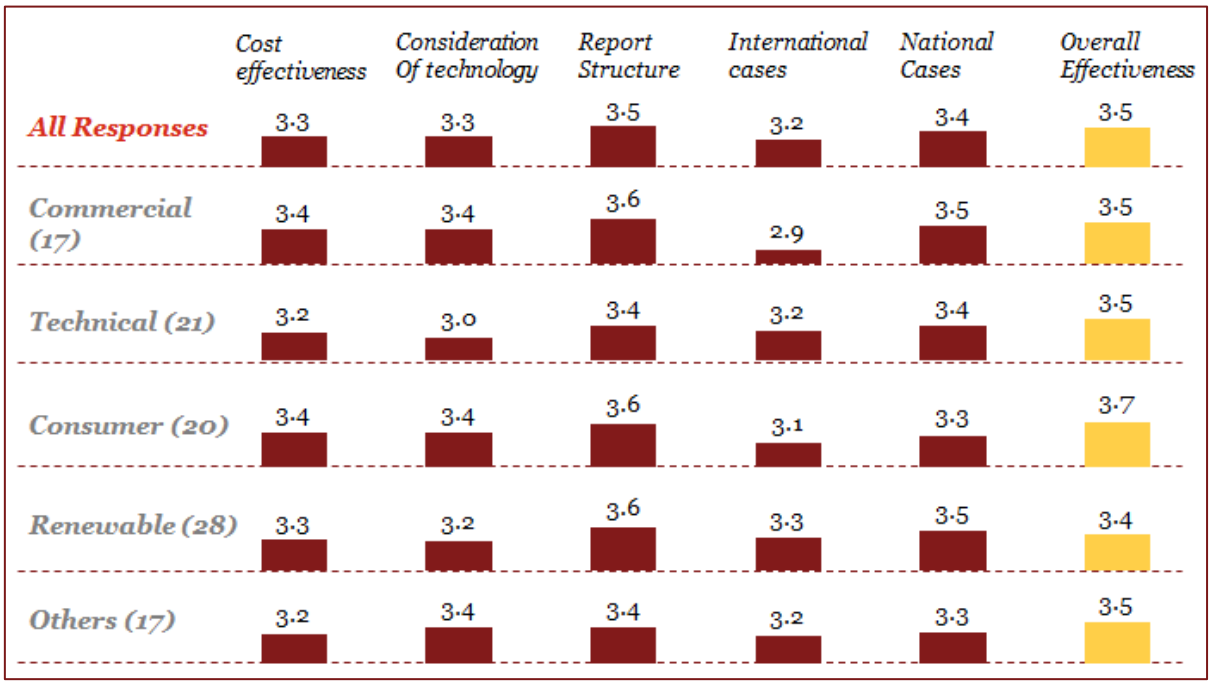


Value add to Studies

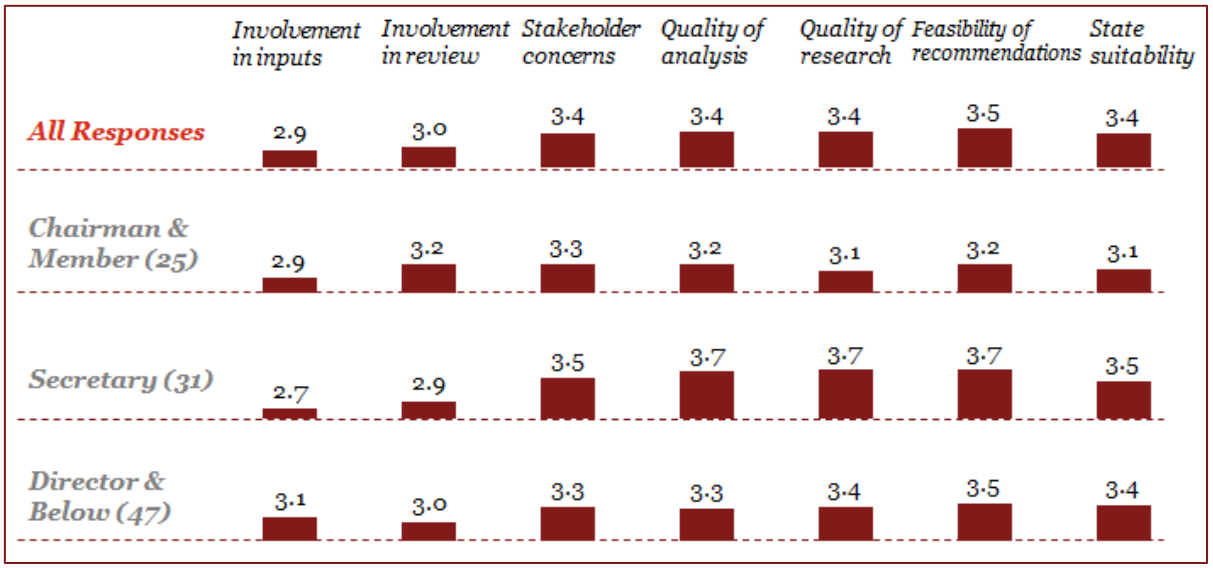


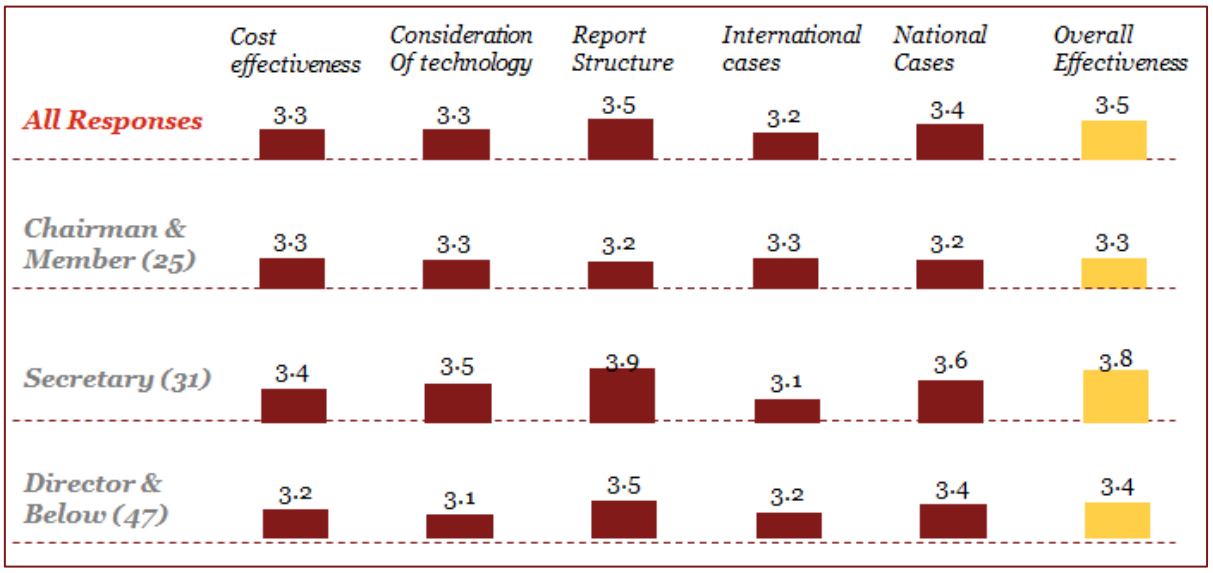
As observed, all parameters that contribute to the comprehensiveness and quality of Study reports (Report Structure and Clarity, Quality of Research, Quality of Analysis, Feasibility of Recommendations, State Suitability of Recommendations, Incorporating Stakeholder Concerns) have been perceived to be satisfactory or marginally below average. However, involvement of SERCs in the execution stage of Studies still seems to be a prevailing concern, as evident from the lower ratings of the parameters signifying involvement of SERCs in providing inputs and finalizing Studies.



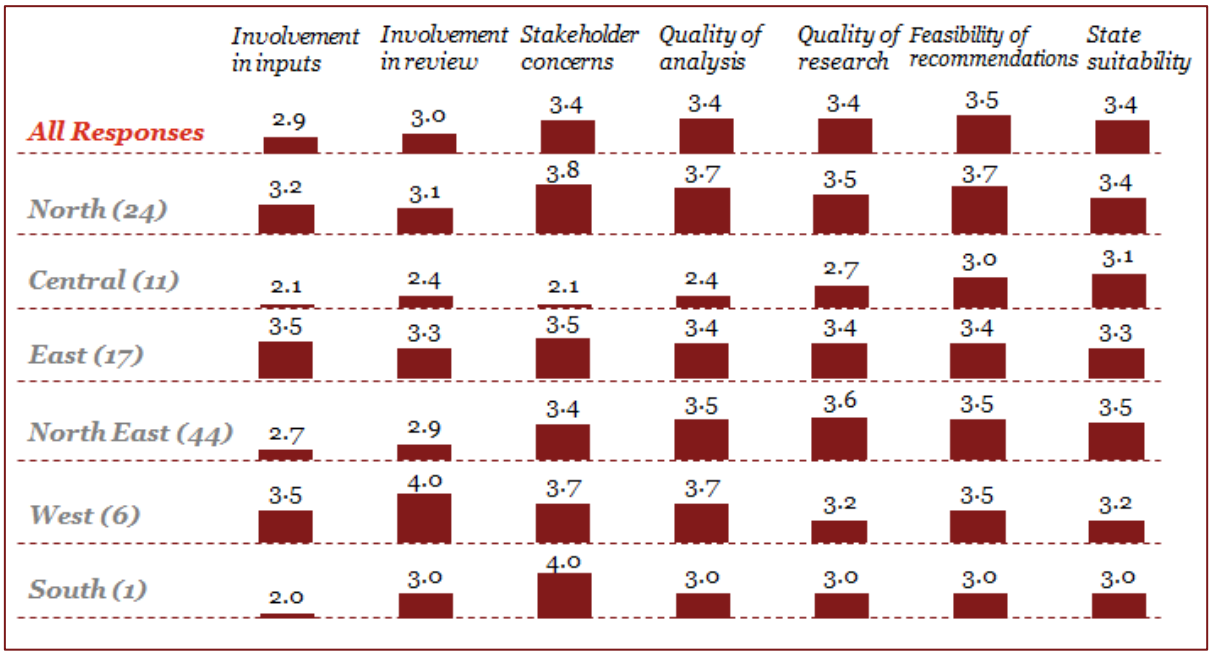


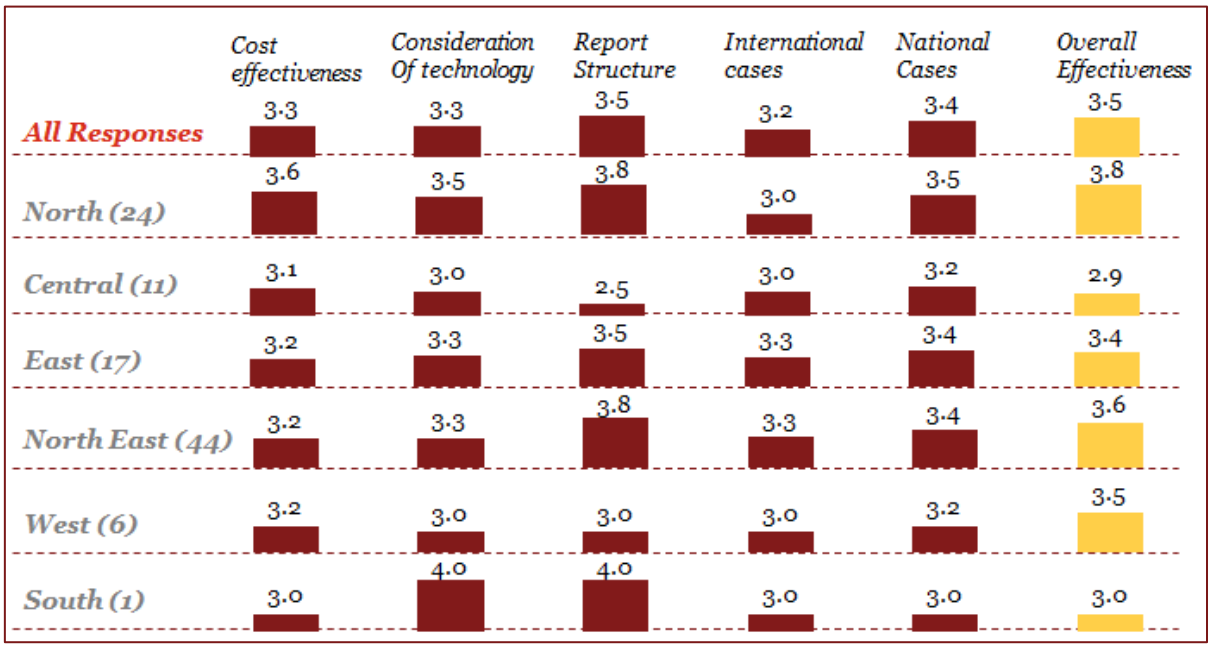
Further incorporation of technology aspect desired by Respondents for Technical and Renewable studies





Secretaries of SERCs have given a relatively higher rating to all parameters contributing to quality and comprehensiveness of Studies, but are less satisfied with their involvement in execution stage of Studies in comparison to other Designation Levels.



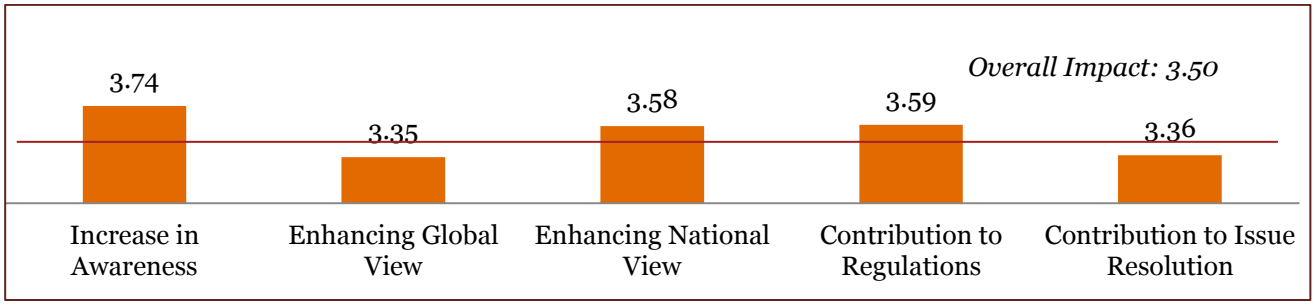


The incorporation of International case studies has been considered crucial across regions, especially by North, West and Central regions, as evident from marginally lower ratings given to them.

As per qualitative responses, state-specific scenarios have been desired by several states for various types of Studies to better reflect the variation in ground-level challenges. States that have not been cited sufficiently in national case studies have perceived their involvement in Study development to be also low.

5.3.1.4. Impact of Studies

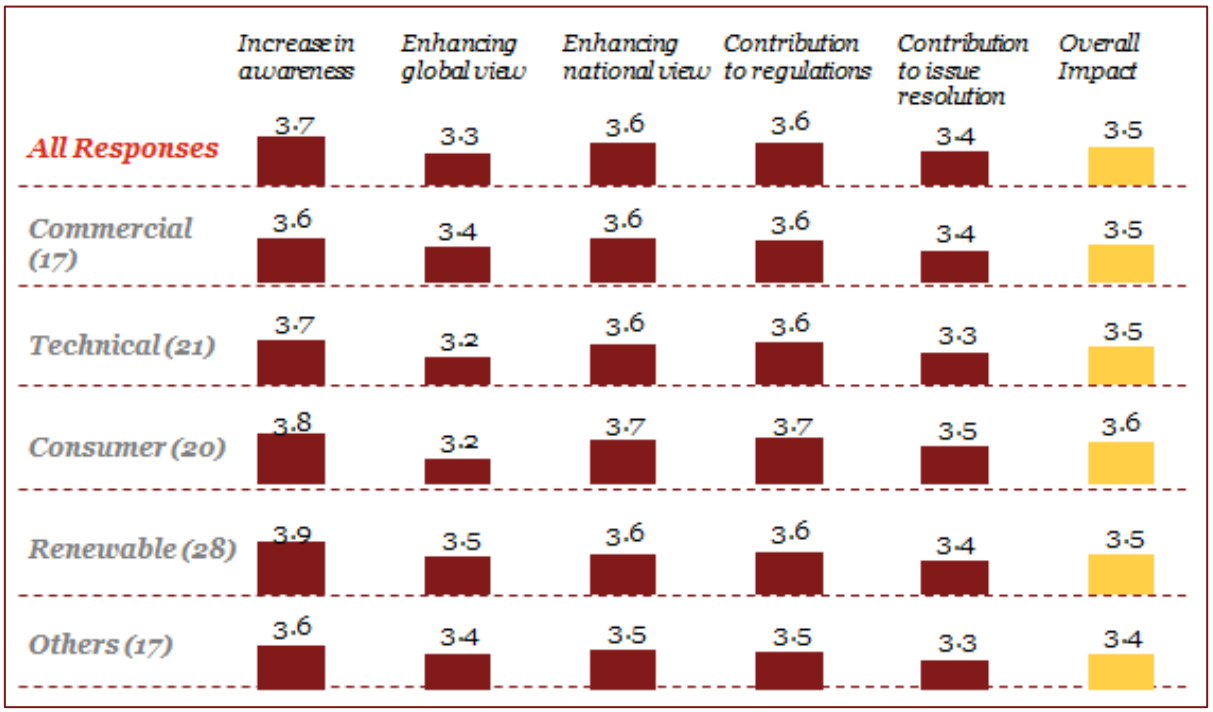
The average ratings of parameters under the Impact Evaluation Criteria have been depicted below:



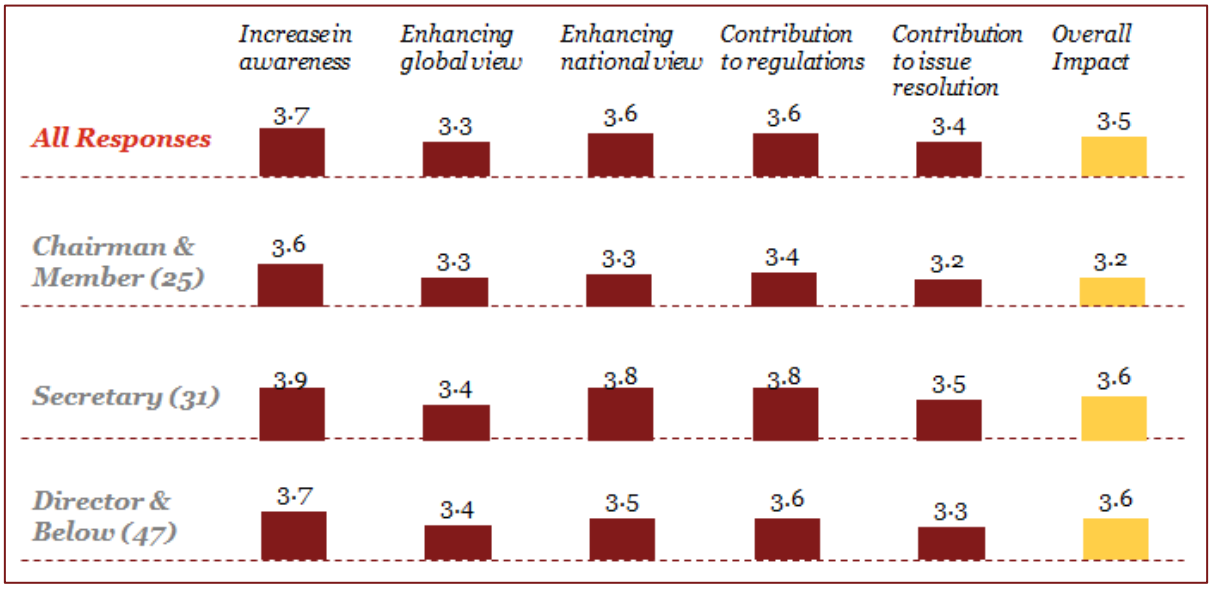
As observed, SERCs have valued the increase in knowledge base and awareness due to Studies, and have rated the parameter of Increase in Awareness relatively higher. This indicates that the perception of satisfactory quality of Studies (Effectiveness Evaluation Criteria) has duly translated into greater awareness of corresponding issues (Impact Evaluation Criteria) for the Respondents.

The Respondents also convey a satisfactory inclusion of national cases in the Studies, enhancing the national view on current issues, and contributing to the comprehensiveness of the Study reports. Consequently, Studies have contributed in a reasonable manner to the formulation of regulations.

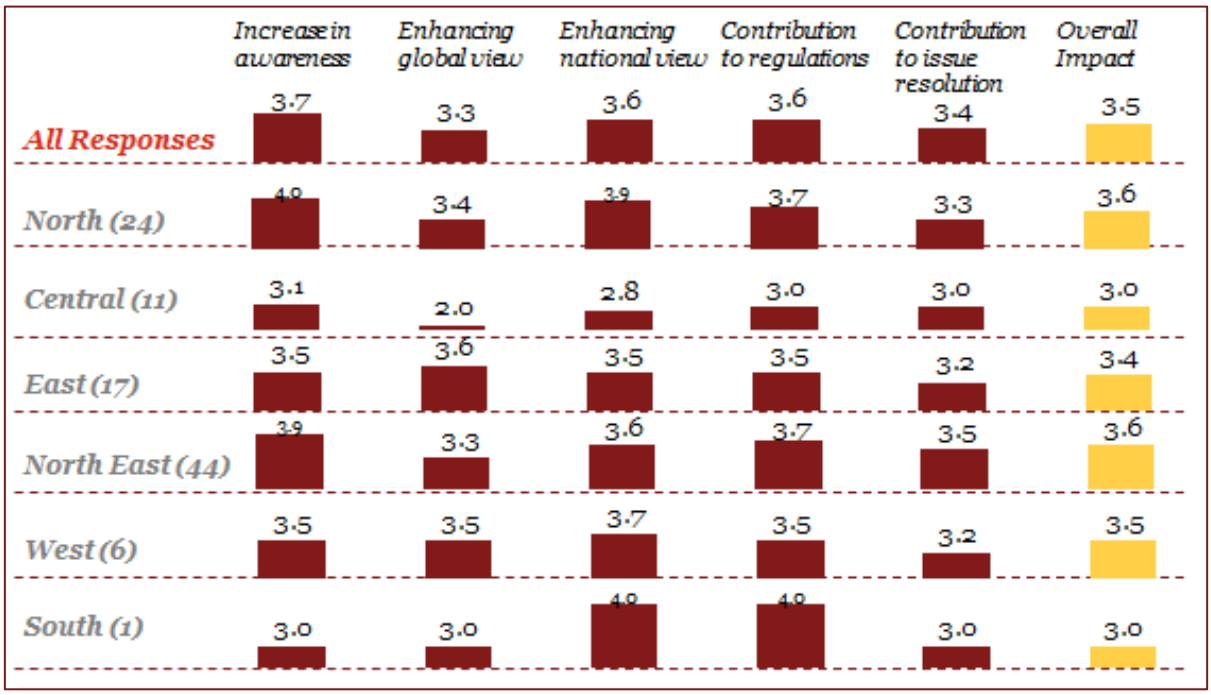
However, the parameter of Enhancing Global View has been rated marginally lower; this reflects a similar concern from Effectiveness Evaluation Criteria that a greater number of suitable international cases could be cited in the Studies. The Respondents have also indicated that there is scope for improvement in how Studies contribute to resolution of actual issues.



Respondents have indicated that there is scope of improvement in Technical and Consumer studies for international perspective, in comparison to other Types of Studies. As also observed, Renewable and Consumer Studies have contributed significantly to the increase in awareness of corresponding issues.



Secretaries and Directors & below have rated Impact parameters higher than Chairman & Member, indicating that they have perceived greater influence of Studies on SERC functions and outputs. Overall, Secretaries and Directors & below perceive that Studies have been more impactful than Chairman & Members.

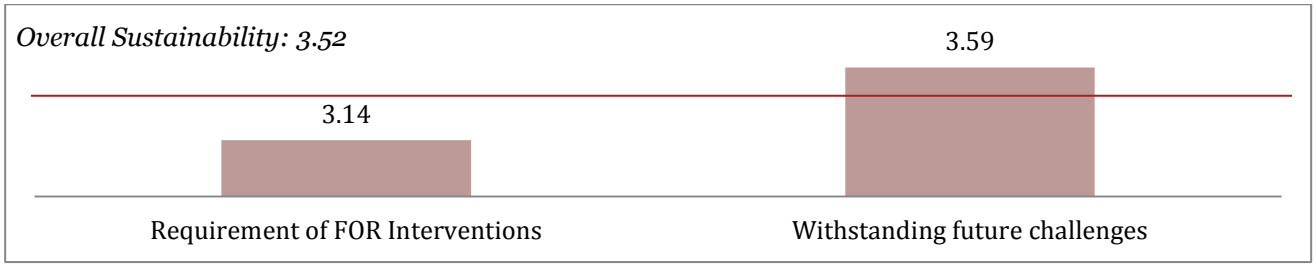


Central region has given a relatively lower rating to Impact parameters than other regions. This has been reflected in the qualitative responses provided by Respondents from Central region, seeking greater involvement in development of Studies as well as more assistance in training of SERC personnel and implementation of recommendations.

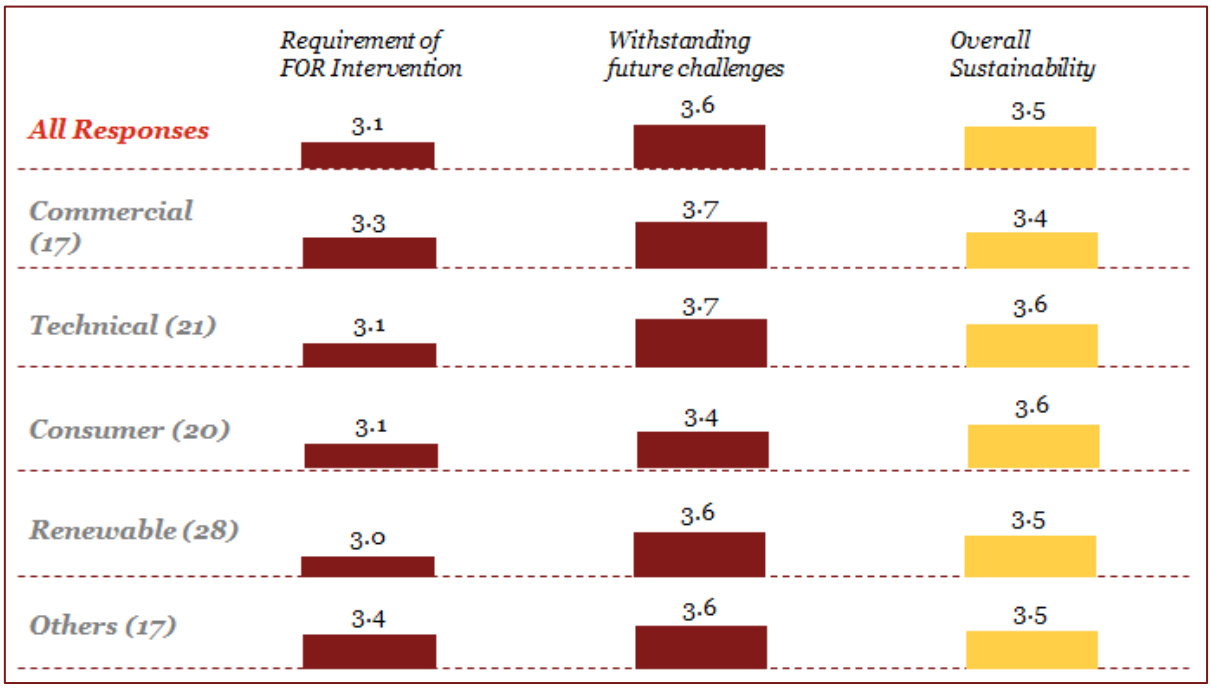
As per qualitative responses, SERCs seek more interactions and deliberations on major issues to aid them in decision making and implementation of Study recommendations.

5.3.1.5. Sustainability of Studies

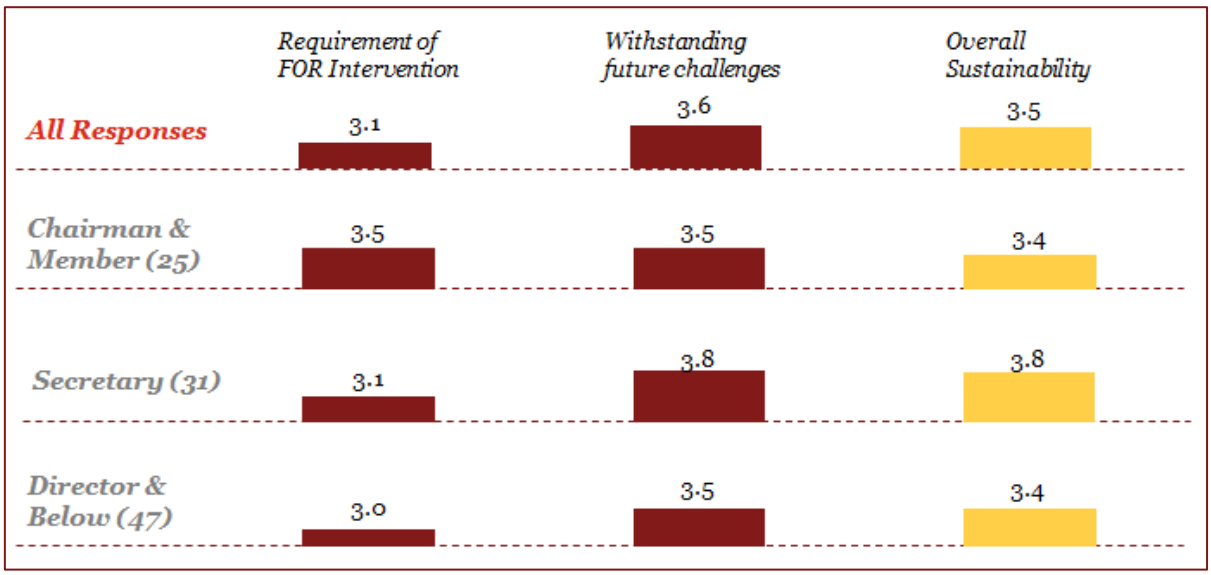
The average ratings of parameters under the Sustainability Evaluation Criteria have been depicted below:



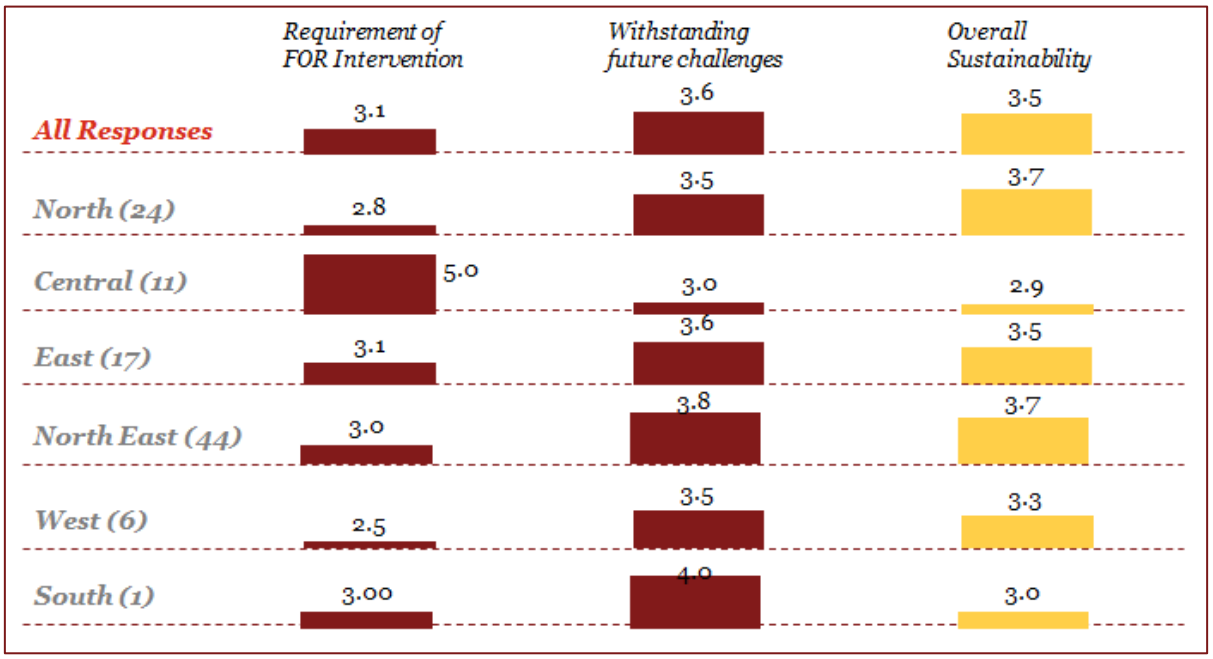
SERCs have considered Studies' recommendations to be fairly sustainable in withstanding practical challenges in the future. On an overall basis, SERCs have also conveyed that moderate support will be required from FOR in the future for implementation of Studies (higher the rating, greater the self-sufficiency of the Study reports and lesser the support required from FOR.)



More support and interventions have been sought by SERCs for implementation of Renewable Studies in comparison to other types of Studies. Consumer Studies have been perceived as marginally lesser sustainable than other Studies.



As evident, Secretary and Directors & Below seek more support from FOR for implementation of Studies in comparison to Chairman & Members.



North and West seek greater support from FOR in comparison to other regions to keep studies relevant and sustainable. Studies have been perceived across regions to be robust and sustainable enough to withstand future challenges.

- *Respondents have indicated in qualitative responses that to aid the SERCs in implementation of Studies, workshops should be organized which include field visits; this will contribute to enhancing the implementation skills of SERC personnel as well*
- *A few SERCs perceive that studies are medium term at best since many initiatives are currently being undertaken in the power sector and revisions may be required to keep up with new trends.*

5.3.2. Summary of parameters evaluated

To identify which parameters have been rated relatively higher, lower and at par across the spectrum of respondents, an initial grouping of 3 has been formed:

1. Group 1, with average rating higher than 3.5
2. Group 2, with average rating between 3 and 3.5
3. Group 3, with average rating lesser than 3

Given groups with the corresponding parameters/questions have been shown below.

Group 1 (>3.5 rating)

Evaluation Criteria	Questions	Grouping Criteria			
		All	Type of Study	Region	Designation
Relevance	Were the topics of the Studies relevant to the functions of the SERC?	√	√	√	√
Relevance	Were the topics of the Studies relevant to the crucial issues/challenges being faced by the SERC?	√	√	√	√
Efficiency	Was the time allocated to the execution of the Studies adequate?	√	√	√	√

Evaluation Criteria	Questions	Grouping Criteria			
		All	Type of Study	Region	Designation
Efficiency	Did FOR communicate/seek inputs and feedback from the SERC for the execution of the Studies in a timely manner?	√	√	√	
Effectiveness	How would you rate the clarity, structure, and presentation of the Study reports?	√	√	√	
Impact	Did the Studies contribute in creating awareness and enhancing the knowledge base of SERC members?	√	√		√
Impact	Did the Studies contribute in providing a national viewpoint of the issues addressed?	√	√	√	√
Impact	Did the Studies contribute to formulation of subsequent regulations/orders/ guidelines/concept papers?	√	√	√	√
Sustainability	Can the recommendations of the Studies withstand practical challenges in the future?	√	√	√	√

Group 2 (>3, <3.5 rating)

Evaluation Criteria	Questions	Grouping Criteria			
		All	Type of Study	Region	Designation
Effectiveness	What was the extent of feedback sought by FOR from the SERC for review/finalization of Studies?	√	√	√	
Effectiveness	Were the concerns of all relevant stakeholders adequately addressed in the recommendations provided in the Studies?	√	√		√
Effectiveness	How would you rate the quality of analysis and insights in the Studies?	√	√		√
Effectiveness	How would you rate the quality of research methodology adopted in the Studies?	√	√	√	√
Effectiveness	Were the Studies' recommendations feasible for implementation?	√		√	√
Effectiveness	Were the Studies' recommendations suitable to state-specific challenges?	√	√	√	√
Effectiveness	Were the Studies' recommendations cost-effective?	√	√	√	√
Effectiveness	Did the Studies' recommendations incorporate state-of-the-art technologies or innovations?	√	√	√	√
Effectiveness	How would you rate the incorporation of international case studies and best practices?	√	√	√	√
Effectiveness	How would rate the incorporation of national and state-specific case studies?	√	√	√	√
Impact	Did the Studies contribute in providing a global viewpoint of the issues addressed?	√	√	√	√
Impact	Did the Studies contribute to actual resolution of prevalent issues in the state?	√	√	√	√

Evaluation Criteria	Questions	Grouping Criteria			
		All	Type of Study	Region	Designation
Sustainability	Would the SERCs require further support or intervention from FOR for implementation of the Studies?	√	√		√

Group 3 (<3 rating)

Evaluation Criteria	Questions	Grouping Criteria			
		All	Type of Study	Region	Designation
Relevance	What was the level of involvement of the SERC in selecting the topics of the Studies?	√	√		√
Relevance	Were the SERC's resources/constraints considered before setting of topics of the Studies?	√	√	√	√
Relevance	Were the implementation challenges of the state considered before setting of topics of the Studies?	√	√	√	√
Effectiveness	What was the level of involvement of the SERC in providing inputs for preparation of the Studies' content?	√	√	√	√

Following observations have been summarized criteria-wise for the given groupings of parameters:

6. **Relevance:** While the relevance of topics and their relation to current issues has been rated higher than average (Group 1), the involvement and consideration of SERCs in the planning stages of Studies has been rated lower than average (Group 3).
7. **Efficiency:** Both parameters have been rated higher than average (Group 1), indicating the satisfaction of SERCs with the efficiency in conduct of Studies undertaken by FOR.
8. **Effectiveness:** Most parameters have been rated average or marginally below average (in particular, value add parameters like cost effectiveness of recommendations, incorporation of technology aspect, and inclusion of international cases), indicating scope of improvement in the overall quality of Studies. The parameter of Report Structure and Clarity has been rated the highest of all Effectiveness parameters (Group 1). However, similar to Relevance Criteria, the involvement of SERCs in providing inputs for Studies continues to be a concern and has been rated lower than average (Group 3).
9. **Impact:** While Impact parameters for creating awareness, providing national perspective and contributing to framing of regulations have been rated higher than average (Group 1), other Impact parameters for providing global perspective and contribution to resolution of actual issues have been rated marginally below average (Group 2).
10. **Sustainability:** SERCs have rated the ability of Studies to withstand future challenges higher than average (Group 1), while indicating that moderate support will be required for certain types of Studies from FOR (Group 2).

The number of parameters falling into each of the given groupings has been summarized below.

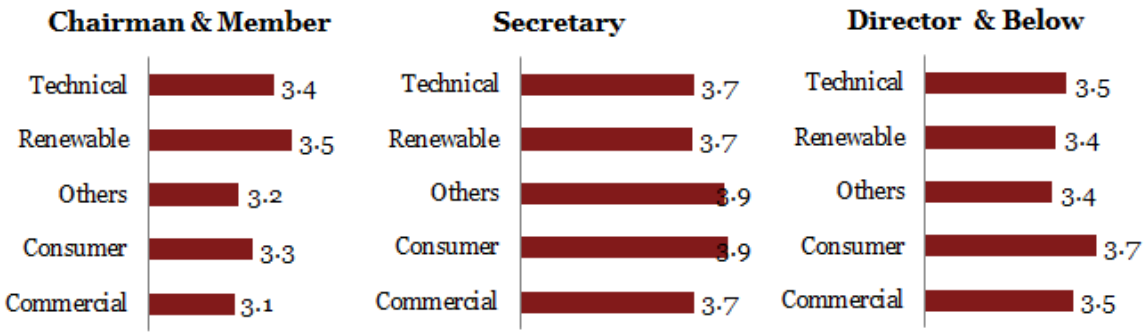
Criteria/ Average Rating	Planning Stage		Execution Stage	Application Stage	
	Relevance	*Efficiency*	*Effectiveness*	*Impact*	*Sustainability*
Group 1 (>3.5)	2	2	1	3	1
Group 2 (b/w 3 & 3.5)			10	2	1

Criteria/ Average Rating	Planning Stage		Execution Stage	Application Stage	
	Relevance	*Efficiency*	*Effectiveness*	*Impact*	*Sustainability*
Group 3 (<3)	3		1		
Total No. of Qs.	**5**	**2**	**12**	**5**	**2**

As observed, execution stage parameters primarily rated in Group 2 and perceived to be satisfactory, while there is greater variation in planning and application stages, with key concerns of involvement of SERCs across the lifecycle of a Study rated lower and falling into Group 3.

Designation vs. Type of Study

To further understand how each designation level has perceived different types of Studies, a cross-sectional analysis between Designation Levels and Type of Study has also been undertaken. As a first step, the overall score for each type of Study has been derived on the basis of weighted scores of all Evaluation Criteria (Relevance (12.5%), Efficiency (12.5%), Effectiveness (25%), Impact (25%) & Sustainability (25%)). The weights have been assigned keeping in mind the significance of 3 broad stages: Planning Stage (comprising of criteria Relevance and Efficiency), Execution Stage (comprising of criteria Effectiveness) and Application Stage (comprising of criteria Impact and Sustainability).



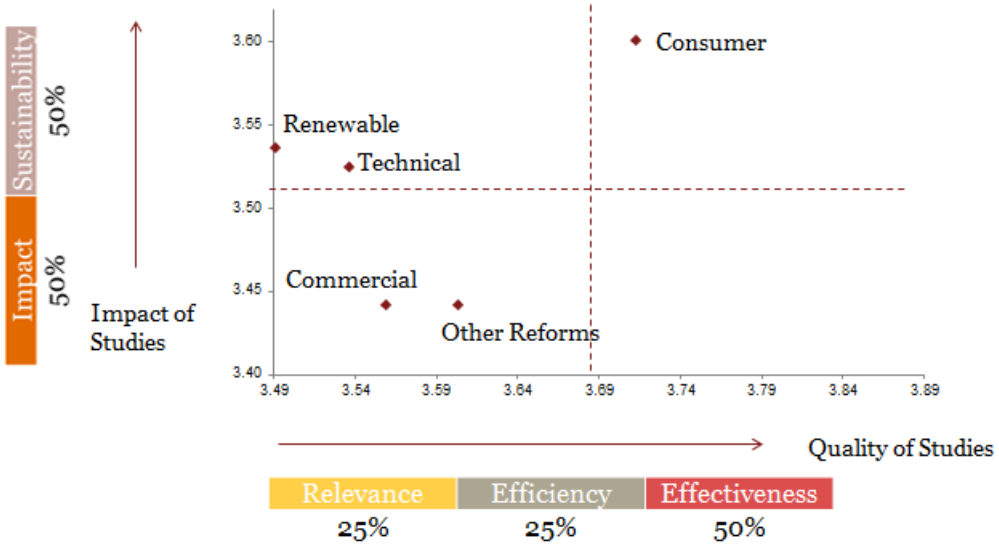
As observed, Chairman and Members have given higher ratings to newer issues (Renewable Studies), while Secretaries and Directors have valued recurring issues (Technical, Consumer and Other Sector Studies). It is also evident that Secretaries and Directors are more satisfied with the quality of various types of Study reports than Chairman and Members.

5.3.3. Mapping of Quality of Studies V Impact of Studies

A major objective of this assignment is enabling greater impact of Studies to be conducted by FOR in the future, and allowing SERCs to suitably adopt Studies' recommendations in the process of undertaking key power sector reforms.

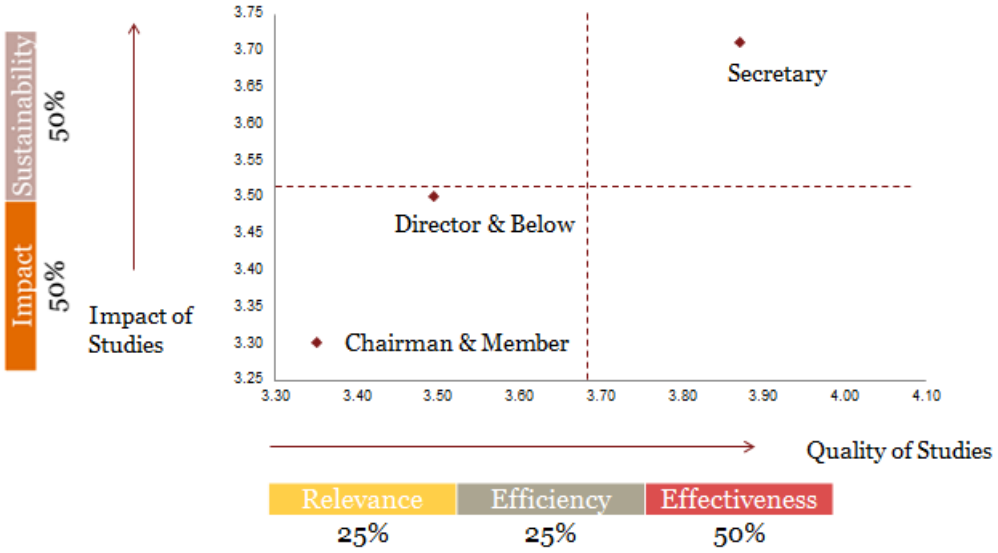
Thus, it is also crucial to understand where each type of Study stands on not only the aspect of quality and depth of Study report, but also how useful and impactful they have proved to be in aiding SERC functions. Accordingly, FOR can determine measures to improve on both aspects. A mapping has thus been undertaken on the basis of these 2 key dimensions: how well the Studies were developed (Quality of Studies), and how impactful the Studies were (Impact of Studies).

To determine Quality of Studies, the Evaluation Criteria of Relevance, Efficiency and Effectiveness were combined in a 1:1:2 ratio, and to determine the Impact of Studies, the Criteria of Impact and Sustainability were combined in a 1:1 ratio.

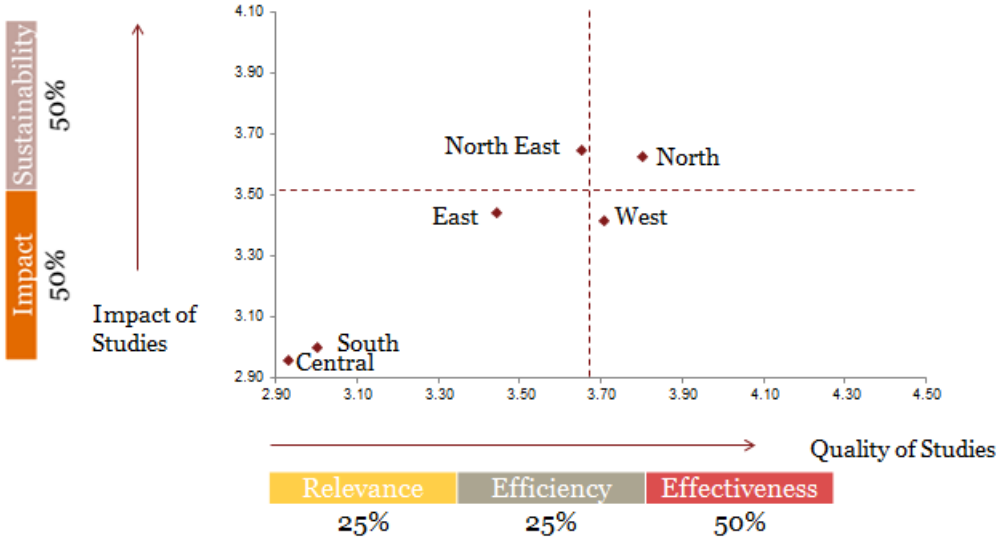


This mapping allows us to visualize the standing of each type of study individually as well as relative to each other on the Quality V Impact map. As observed, Consumer Studies lie higher on both Quality as well as Impact scale, indicating that Studies perceived to be of high quality have also gained a favourable perception for greater Impact on SERCs. As also observed, Commercial and Other Sector Studies lie lower on the Impact scale and may be improved for greater impact in the future, while Renewable, Technical and Commercial Studies lie lower on the Quality scale and may be improved for greater depth and coverage of content in the future.

A similar mapping has also been undertaking for other cross-sections, as given below.



As can be observed, Secretaries find Studies both comprehensive and impactful; however, Chairman & Member desire improvement on both fronts of quality and impact.



Respondents from North and North East regions find studies more impactful than others, while Central region desires improvement on both fronts of quality and impact.

In the following section, various statistical analysis conducted on the responses to identify the most crucial and influential parameters has been outlined.

5.4. Statistical Analysis

To identify the most critical and influential variables out of the wide spectrum of survey parameters, each evaluation criteria and its underlying parameters were subjected to various statistical analysis. The tool of SPSS was used to execute the required statistical analysis. Complete results of the analysis have also been attached as Annexure 2.1 to this report.

The results of such analysis have been outlined in the following section.

5.4.1. Determining the most significant parameters

Regression analysis was undertaken to measure the relationship between parameters and evaluation criteria, that is, to identify the most significant parameters under each Evaluation Criteria which contributed to the overall rating for that Criteria. This enables us to shortlist parameters that respondents perceive most critical for the success of each Evaluation Criteria, as provided in the following section.

> ***Regression analysis*** *is a statistical methodology for estimating the relationships among variables, such as the relationship between a dependent variable and one or more independent variables. In particular, regression analysis helps one understand how the typical value of the dependent variable changes when any one of the independent variables is varied, while the other independent variables are held fixed.*

5.4.1.1. Relevance of Studies

For Relevance Criteria, regression analysis was undertaken considering all the Relevance parameters as Independent Variables, and the parameter for assessing the Overall Relevance of Studies as the Dependent Variable.

The outcome of regression analysis has been shown for Relevance criteria to understand the process of analysis.

Model Summary

Model	R	R Square[b]	Adjusted R Square	Std. Error of the Estimate
1	.992[a]	.985	.984	.47694

a. Predictors: Relevance_SERCsChallenges, Relevance_Topics, Relevance_SERCsResources, Relevance_SERCsInvolvement, Relevance_SERCsIssues

b. For regression through the origin (the no-intercept model), R Square measures the proportion of the variability in the dependent variable about the origin explained by regression. This CANNOT be compared to R Square for models which include an intercept.

The Model Summary table provides the R and R2 values. The R value represents the simple correlation and is 0.992 (the "R" Column), which indicates a high degree of correlation. The R2 value (the "R Square" column) indicates how much of the total variation in the dependent variable, Overall Relevance, can be explained by the independent variables (all parameters under Relevance Criteria) and is 0.985, which is quite large. The adjusted R-square is a modified version of R-square that adjusts for the number of predictors in the model.

ANOVA[c,d]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1362.618	5	272.524	1.198E3	.000[a]
	Residual	21.382	94	.227		

Total	1384.000[b]	99			

a. Predictors: Relevance_SERCsChallenges, Relevance_Topics, Relevance_SERCsResources, Relevance_SERCsInvolvement, Relevance_SERCsIssues

b. This total sum of squares is not corrected for the constant because the constant is zero for regression through the origin.

c. Dependent Variable: Overall_Relevance

d. Linear Regression through the Origin

The ANOVA table indicates that the regression model predicts the dependent variable significantly well. The statistical significance of the regression model ("Sig." column) is less than 0.05, and indicates that, overall, the regression model significantly predicts the outcome variable (i.e., it is a good fit for the data).

Coefficients[a,b]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Relevance_Topics	.331	.082	.350	4.036	.000
	Relevance_SERCsInvolvement	-.005	.099	-.004	-.047	.963
	Relevance_SERCsIssues	.466	.098	.457	4.751	.000
	Relevance_SERCsResources	.117	.099	.094	1.189	.237
	Relevance_SERCsChallenges	.127	.090	.104	1.415	.160

a. Dependent Variable: Overall_Relevance

b. Linear Regression through the Origin

The Coefficients table provides us with the necessary information to predict Overall Relevance from other Relevance parameters. The values in "Beta" column (Standardized Coefficients) define the weight of each parameter in determining Overall Relevance in a regression equation. The Significance for each parameter tests the null hypothesis that the coefficient is equal to zero (no effect). A low Significance value (< 0.05) indicates that null hypothesis can be rejected.

The Beta and Significance value of each parameter (weightage and significance of data) has been summarized below:

Parameters	Beta	Sig.
Relevance of Topics	0.350	0.000
SERCs Involvement	-0.004	0.963
Relevance of Issues	0.457	0.000
Resources Consideration	0.094	0.237
SERCs Challenges	0.104	0.160

As highlighted, Relevance of Studies' topics and Relevance of Studies to issues faced by states display the highest Beta values with lowest significance levels, thus expressing a strong relationship with the parameter of Overall Relevance. Thus, these two parameters predict and influence the overall perception of Relevance of Studies the most in the respondents' outlook.

Regression analysis has also been undertaken for responses for each cross section, as shown below.

Type of Study

Parameters	Commercial		Technical		Consumer		Renewable		Other Sector Reforms	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
Relevance of Topics	0.32	0.002	0.06	0.731	0.41	0.093	0.37	0.056	0.43	0.162
SERCs Involvement	-0.02	0.910	0.31	0.101	-0.24	0.200	-0.19	0.169	0.83	0.034
Relevance of Issues	0.62	0.000	0.56	0.011	0.40	0.088	0.48	0.030	0.48	0.299
Resources Consideration	-0.04	0.839	-0.14	0.320	0.36	0.031	0.26	0.068	-0.83	0.106
SERCs Challenges	0.12	0.439	0.21	0.167	0.06	0.706	0.08	0.500	0.09	0.813

For most types of Studies, Relevance of Studies' topics and Relevance of Studies to issues faced by states perceived to be most significant parameters. However, for Other Sector Studies, the involvement of SERCs perceived to be the most significant parameter. For Consumer and Renewable Studies, the parameter of Consideration of SERC resources at the planning stage has been held significant.

Designation

Parameters	Secretary		Director		Chairman & Member	
	Beta	Sig.	Beta	Sig.	Beta	Sig.
Relevance of Topics	0.389	0.031	0.272	0.016	0.121	0.538
SERCs Involvement	-0.163	0.450	0.176	0.196	0.097	0.388
Relevance of Issues	0.638	0.002	0.315	0.014	0.402	0.056
Resources Consideration	0.155	0.363	0.170	0.137	0.333	0.066
SERCs Challenges	-0.023	0.864	0.072	0.517	0.051	0.753

Chairman, Member and Director identify resource constraint as a significant parameter in addition to relevance of topics.

Region

Parameters	North		Central		North East		East	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
Relevance of Topics	0.255	0.073	-0.199	0.380	0.591	0.000	0.129	0.571
SERCs Involvement	0.222	0.076	-0.088	0.733	0.072	0.615	-0.024	0.884
Relevance of Issues	0.641	0.000	0.458	0.054	0.323	0.051	0.707	0.046
Resources Consideration	-0.061	0.640	0.502	0.047	-0.002	0.985	-0.013	0.955
SERCs Challenges	-0.056	0.620	0.336	0.041	0.016	0.900	0.199	0.276

Central region in particular perceives that consideration of SERC resources and challenges are significant parameters, while the North region also relates the involvement of SERC personnel in the planning stages as a significant parameter.

As per qualitative responses, greater involvement for determining new study topics is sought by several SERCs, with suggestions including the development of an inclusive and scientific method for determination of Study topics.

5.4.1.2. Efficiency in conduct of Studies

For Efficiency Criteria, regression analysis was undertaken considering all the Efficiency parameters as Independent Variables, and the parameter for assessing the Overall Efficiency of Studies as the Dependent Variable. Results of the same have been summarized below:

Parameters	Beta	Significance
Adequate Time Allocation to Studies	0.570	0.000
Timely Communication from FOR	0.422	0.000

Both parameters perceived to express Overall Efficiency significantly on an overall basis.

Type of Study

Parameters	Commercial		Technical		Consumer		Renewable		Other Sector Reforms	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
Adequate Time Allocation to Studies	0.630	0.014	0.542	0.012	0.745	0.012	0.298	0.006	0.867	0.008
Timely Communication from FOR	0.362	0.123	0.452	0.031	0.234	0.031	0.703	0.000	0.125	0.624

With the exception of Renewable Studies, the parameter of Adequate Time Allocation to Studies considered to influence the Overall Efficiency of Studies the most.

Designation

Parameters	Secretary		Director		Chairman & Member	
	Beta	Sig.	Beta	Sig.	Beta	Sig.
Adequate Time Allocation to Studies	0.809	0.000	0.164	0.115	0.675	0.006
Timely Communication from FOR	0.185	0.093	0.831	0.000	0.317	0.158

For Directors and below, timely communication from FOR has been considered as the strongest indicator of efficient conduct of studies, while for other Designation Levels, adequate time allocation to Studies considered to influence the overall efficiency of Studies.

Region

Parameters	North		Central		North East		East	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
Adequate Time Allocation to Studies	0.045	0.881	0.395	0.541	0.650	0.000	0.354	0.120
Timely Communication from FOR	0.949	0.007	0.601	0.382	0.343	0.002	0.640	0.009

For the North and North East regions, Timely Communication from FOR considered as the strongest factor that influences the overall rating of efficiency, while the time allocation to Studies considered more significant by the North East region.

5.4.1.3. Effectiveness of Studies

For Effectiveness Criteria, regression analysis was undertaken considering all the Effectiveness parameters as Independent Variables, and the parameter for assessing the Overall Effectiveness of Studies as the Dependent Variable. Results of the same have been summarized below:

Parameters	Beta	Sig.
SERCs Involvement in Providing Inputs	-0.076	0.176
SERCs Involvement in Finalizing Studies	0.010	0.872
Incorporating Stakeholder Concerns	0.028	0.728
Quality of Analysis	0.344	0.002
Quality of Research	0.149	0.169
Feasibility of Recommendations	0.160	0.084
State Suitability of Recommendations	0.041	0.668
Cost Effectiveness of Recommendations	-0.032	0.740
Consideration of Technology Aspect	0.056	0.447
Report Structure and Clarity	0.086	0.438
Including International Cases	-0.045	0.531
Including National Cases	0.276	0.008

Parameters that define comprehensiveness of reports (Quality of Analysis, Quality of Research, Feasibility of Recommendations, and Inclusion of National Cases) found to express Overall Effectiveness strongly for respondents.

Type of Study

Parameters	Commercial		Technical		Consumer		Renewable		Other Sector Reforms	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
SERCs Involvement in Providing Inputs	-0.273	0.000	0.377	0.076	-0.170	0.076	-0.055	0.693	-0.336	0.204
SERCs Involvement in Finalizing Studies	0.293	0.000	-0.181	0.352	-0.205	0.352	0.184	0.264	0.155	0.497
Incorporating Stakeholder Concerns	0.000	1.000	0.159	0.454	-0.181	0.454	-0.192	0.243	0.503	0.275
Quality of Analysis	-0.641	0.000	0.335	0.167	-0.115	0.167	0.358	0.164	0.239	0.533
Quality of Research	1.950	0.000	0.248	0.538	0.863	0.538	0.539	0.056	0.216	0.536
Feasibility of Recommendations	0.000	1.000	-0.003	0.990	0.436	0.990	-0.228	0.403	-0.292	0.481
State Suitability of Recommendations	0.000	1.000	-1.117	0.046	-0.528	0.046	-0.261	0.414	-0.535	0.268
Cost Effectiveness of Recommendations	-0.312	0.000	-0.307	0.196	0.426	0.196	0.515	0.103	0.193	0.530
Consideration of Technology Aspect	0.318	0.000	-0.202	0.312	-0.115	0.312	-0.147	0.405	0.200	0.618
Report Structure and Clarity	-0.344	0.000	1.459	0.005	0.098	0.005	0.289	0.274	0.409	0.327
Including International Cases	0.000	1.000	-0.801	0.008	0.321	0.008	-0.107	0.655	0.242	0.530
Including National Cases	0.000	1.000	1.033	0.004	0.155	0.004	0.112	0.684	0.112	0.684

As observed, there are varying combinations of factors contributing to effectiveness of different types of studies.

Designation

Parameters	Secretary		Director		Chairman & Member	
	Beta	Sig.	Beta	Sig.	Beta	Sig.
SERCs Involvement in Providing Inputs	-0.376	0.003	0.256	0.037	-0.011	0.858
SERCs Involvement in Finalizing Studies	0.203	0.129	-0.158	0.112	0.056	0.428
Incorporating Stakeholder Concerns	0.108	0.584	0.073	0.566	-0.055	0.487
Quality of Analysis	0.207	0.438	0.170	0.287	0.263	0.038
Quality of Research	-0.250	0.175	0.355	0.063	0.329	0.013
Feasibility of Recommendations	0.084	0.632	0.085	0.495	0.467	0.001
State Suitability of Recommendations	0.051	0.808	-0.082	0.546	-0.302	0.094

Parameters	Secretary		Director		Chairman & Member	
	Beta	Sig.	Beta	Sig.	Beta	Sig.
Cost Effectiveness of Recommendations	0.333	0.112	0.080	0.588	-0.114	0.447
Consideration of Technology Aspect	-0.059	0.790	0.088	0.287	-0.146	0.162
Report Structure and Clarity	0.036	0.896	0.301	0.119	0.080	0.594
Including International Cases	0.138	0.291	-0.104	0.383	0.218	0.073
Including National Cases	0.513	0.058	-0.062	0.688	0.218	0.022

As observed, in addition to quality aspects, involvement in execution stage of Studies also held significant by Directors & below. Value highlighted in dark are not strictly significant, but can be considered for contribution to the overall parameter.

Region

Parameters	North		Central		North East		East	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
SERCs Involvement in Providing Inputs	0.044	0.844	.	.	-0.175	0.025	0.000	.
SERCs Involvement in Finalizing Studies	0.099	0.772	.	.	0.071	0.391	0.976	.
Incorporating Stakeholder Concerns	-0.020	0.956	.	.	0.216	0.146	0.000	.
Quality of Analysis	0.832	0.134	.	.	0.172	0.320	1.023	.
Quality of Research	-0.202	0.669	.	.	0.000	0.997	0.000	.
Feasibility of Recommendations	-0.531	0.278	.	.	0.054	0.689	0.000	.
State Suitability of Recommendations	0.673	0.225	.	.	0.228	0.139	0.976	.
Cost Effectiveness of Recommendations	0.505	0.219			-0.268	0.139		
Consideration of Technology Aspect	-0.354	0.228	.	.	0.101	0.288	0.000	.
Report Structure and Clarity	0.174	0.766	.	.	0.141	0.471	-1.052	.
Including International Cases	0.095	0.569	.	.	-0.059	0.676	-0.927	.
Including National Cases	-0.321	0.426	.	.	0.515	0.004	0.000	.

As observed, inclusion of state scenarios and national case studies consistently regarded significant across regions.

5.4.1.4. Impact of Studies

For Impact Criteria, regression analysis was undertaken considering all the Impact parameters as Independent Variables, and the parameter for assessing the Overall Impact of Studies as the Dependent Variable. Results of the same have been summarized below:

Parameters	Beta	Sig.
Increase in Awareness	0.328	0.002
Enhancing Global View	0.201	0.020
Enhancing National View	0.094	0.414
Contribution to Regulations	0.107	0.338
Contribution to Issue Resolution	0.270	0.007

Contribution to awareness, global perspective of issues and resolution of actual issues have been considered significant for studies to be impactful.

Type of Study

Parameters	Commercial	Technical	Consumer	Renewable	Other Sector Reforms

	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
Increase in Awareness	1.291	0.004	0.186	0.416	0.940	0.416	0.206	0.321	0.229	0.490
Enhancing Global View	0.046	0.800	0.447	0.065	-0.085	0.065	0.344	0.153	0.198	0.455
Enhancing National View	-0.563	0.089	0.026	0.932	0.475	0.932	0.053	0.826	0.116	0.790
Contribution to Regulations	-0.660	0.088	0.160	0.484	-0.425	0.484	0.197	0.430	0.084	0.774
Contribution to Issue Resolution	0.884	0.006	0.184	0.485	0.088	0.485	0.201	0.415	0.374	0.112

Enhancement in global perspective have been considered most significant for Technical and Renewable Studies, while Increase in Awareness and Contribution to Issue Resolution considered most significant for Commercial Studies.

Designation

Parameters	Secretary		Director		Chairman & Member	
	Beta	Sig.	Beta	Sig.	Beta	Sig.
Increase in Awareness	0.920	0.004	0.465	0.002	-0.067	0.701
Enhancing Global View	0.234	0.079	0.138	0.292	0.330	0.272
Enhancing National View	-0.163	0.524	-0.014	0.930	0.463	0.098
Contribution to Regulations	-0.457	0.097	0.192	0.210	0.351	0.107
Contribution to Issue Resolution	0.465	0.038	0.220	0.061	-0.077	0.752

For Chairman and Members, knowledge of other states and contribution of studies to regulations have been considered significant. Value highlighted in dark are not strictly significant, but can be considered for contribution to the overall parameter.

Region

Parameters	North		Central		North East		East	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
Increase in Awareness	0.814	0.080	.	.	0.255	0.106	-1.054	.
Enhancing Global View	0.149	0.419	.	.	0.100	0.467	2.048	.
Enhancing National View	-0.322	0.510	.	.	0.180	0.285	0.000	.
Contribution to Regulations	0.193	0.512	.	.	0.204	0.238	0.000	.
Contribution to Issue Resolution	0.164	0.485	.	.	0.260	0.059	0.000	.

Increase in Awareness and Contribution to Issue Resolution have been considered most significant by North and North East regions.

5.4.1.5. Sustainability of Studies

For Sustainability Criteria, regression analysis was undertaken considering all the Sustainability parameters as Independent Variables, and the parameter for assessing the Overall Sustainability of Studies as the Dependent Variable. Results of the same have been summarized below:

Parameters	Beta	Sig.
Requirement of FOR Interventions	0.058	0.004
Withstanding future challenges	0.931	0.000

The ability of studies to withstand future challenges has been considered as the strongest expression of sustainability.

Type of Study

Parameters	Commercial		Technical		Consumer		Renewable		Other Sector Reforms	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
Requirement of FOR Interventions	0.086	0.428	-0.046	0.611	0.096	0.611	-0.024	0.749	0.248	0.063
Withstanding future challenges	0.909	0.000	1.033	0.000	0.893	0.000	1.009	0.000	0.750	0.000

Future support from FOR also regarded significant for Other Sector Studies, while the ability of Studies to withstand future challenges considered the most significant parameter for all types of Studies.

Designation

Parameters	Secretary		Director		Chairman & Member	
	Beta	Sig.	Beta	Sig.	Beta	Sig.
Requirement of FOR Interventions	-0.093	0.190	0.062	0.349	0.269	0.017
Withstanding future challenges	1.080	0.000	0.926	0.000	0.730	0.000

Future support from FOR also regarded significant by Chairman and Member, while the ability of Studies to withstand future challenges considered the most significant parameter across Designation Levels.

Region

Parameters	North		Central		North East		East	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
Requirement of FOR Interventions	0.160	0.137	-	-	0.009	0.923	0.225	0.057
Withstanding future challenges	0.837	0.000	0.995	0.000	0.975	0.000	0.775	0.000

Future support from FOR regarded significant by East region, while the ability of Studies to withstand future challenges considered the most significant parameter across regions.

5.4.1.6. Most significant parameters for each evaluation criteria

The list of most significant parameters as deduced from regression analysis of each evaluation criteria have been outlined below.

Evaluation Criteria	Parameter	Beta Value	Significance Value	Corresponding question asked in Survey
Relevance	Relevance of study topics	0.350	0.000	Were the topics of the Studies relevant to the functions of the SERC?
	Relevance to SERC Issues	0.457	0.000	Were the topics of the Studies relevant to the crucial issues/challenges being faced by the SERC?
Efficiency	Timely communication from FOR	0.422	0.000	Did FOR communicate/seek inputs and feedback from the SERC for the execution of the Studies in a timely manner?
	Time Allocation to	0.570	0.000	Was the time allocated to the

Evaluation Criteria	Parameter	Beta Value	Significance Value	Corresponding question asked in Survey
	Studies			execution of the Studies adequate?
Effectiveness	Quality of Research	0.149	0.169	How would you rate the quality of research methodology adopted in the Studies?
	Quality of Analysis	0.344	0.002	How would you rate the quality of analysis and insights in the Studies?
	Including National Cases	0.276	0.008	How would rate the incorporation of national and state-specific case studies in highlighting prevalent issues in the Studies?
	Feasibility of Recommendations	0.160	0.084	Were the Studies' recommendations feasible for implementation?
Impact	Increase in Awareness	0.328	0.002	Did the Studies contribute in creating awareness and enhancing the knowledge base of SERC members?
	Enhancing Global View	0.201	0.020	Did the Studies contribute in providing a global viewpoint of the issues addressed?
	Contribution to Issue Resolution	0.270	0.007	Did the Studies contribute to actual resolution of prevalent issues in the state?
Sustainability	Withstanding future challenges	0.931	0.000	Can the recommendations of the Studies withstand practical challenges in the future?

The given parameters influence the rating of each Evaluation Criteria the most, and therefore hold most significance for the SERCs. Therefore, each of these parameters needs to be scrutinized for satisfactory completion of each study.

5.4.2. Discovering new groups of parameters

A lifecycle approach was formulated for impact assessment of FOR Studies to ensure coverage of all key parameters under 5 heads: Relevance, Efficiency, Effectiveness, Impact and Sustainability. However, it is also crucial to discover the overarching basis/factors *as perceived by Respondents* which encompass the larger set of initial parameters.

Factor Analysis (Principal components analysis) *is a variable-reduction technique. Its aim is to reduce a larger set of variables into a smaller set of overarching variables, called 'principal components', which account for most of the variance in the original variables.*

Factor Analysis (Principal Components) was thus undertaken to identify new groups of parameters as per the proximity/similarity of response trends.

The outcomes of Principal Components analysis has been shown below for understanding the process of analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %

1	10.047	38.641	38.641	10.047	38.641	38.641	5.258	20.223	20.223
2	3.696	14.215	52.857	3.696	14.215	52.857	3.986	15.332	35.555
3	1.507	5.794	58.651	1.507	5.794	58.651	3.693	14.203	49.759
4	1.260	4.847	63.498	1.260	4.847	63.498	2.573	9.897	59.655
5	1.201	4.620	68.118	1.201	4.620	68.118	1.884	7.246	66.901
6	1.128	4.337	72.455	1.128	4.337	72.455	1.444	5.554	72.455
7	.943	3.627	76.083						
8	.847	3.257	79.340						
9	.714	2.744	82.084						
10	.669	2.572	84.656						
11	.561	2.159	86.815						
12	.503	1.933	88.748						
13	.458	1.761	90.509						
14	.390	1.500	92.009						
15	.334	1.284	93.293						
16	.313	1.205	94.499						
17	.238	.917	95.415						
18	.224	.860	96.276						
19	.205	.790	97.066						
20	.171	.657	97.723						
21	.151	.581	98.304						
22	.130	.499	98.803						
23	.124	.477	99.280						
24	.081	.310	99.590						
25	.065	.250	99.840						
26	.042	.160	100.000						

Extraction Method: Principal Component Analysis.

Eigenvalues are the variances of factors. Values in the "Extraction Sums of Squared Loadings" column are calculated in the same way as Eigenvalues, except that here the values are based on the common variance (which is smaller than total variance).

The values in the column "Rotation Sums of Squared Loadings" of the table represent the distribution of the variance after the varimax rotation. Varimax rotation tries to maximize the variance of each of the factors, so the total amount of variance accounted for is redistributed over the extracted factors.

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
Relevance_Topics	-.273	.675	.127	.300	.043	.280

Relevance_SERCsInvolvement	.849	.093	.114	.114	.056	-.098
Relevance_SERCsIssues	.013	.592	.412	.272	.196	-1.153E-6
Relevance_SERCsResources	.897	.076	.183	.055	-.008	-.037
Relevance_SERCsChallenges	.729	.354	-.038	.158	.105	-.126
Efficiency_TimeAllocation	.177	.130	.094	.064	.003	.907
Efficiency_TimelyCommunication	.733	.020	.077	.051	.166	.290
Effectiveness_SERCsInvolvement	.917	.022	.114	.014	.005	.088
Effectiveness_SERCsFeedback	.754	-.101	.319	.165	.098	.215
Effectiveness_StakeholderConcerns	.425	.478	.151	.055	.461	.155
Effectiveness_Analysis	.373	.585	.427	.155	.141	.281
Effectiveness_Research	.095	.492	.604	.060	.212	.168
Effectiveness_Feasibility	.096	.756	.101	.335	.056	.008
Effectiveness_StateSuitability	.047	.343	.250	.641	-.060	-.015
Effectiveness_CostEffectiveness	.281	.097	.056	.827	.106	.089
Effectiveness_Technology	.149	.427	.346	.540	-.011	.028
Effectiveness_ReportStructure	-.131	.353	.529	.391	.201	.117
Effectiveness_International	.343	-.110	.705	.230	.030	.037
Effectiveness_National	.311	.385	.626	.212	.102	.142
Impact_Awareness	.035	.300	.691	.139	.065	.064
Impact_GlobalView	.349	.427	.613	-.104	.097	-.272
Impact_NationalView	.323	.739	.384	.052	.177	-.151
Impact_Regulations	.158	.210	.493	.404	.481	-.248
Impact_IssueResolution	.101	.383	.336	.520	.413	.097
Sustainability_FORIntervention	-.461	-.125	.069	-.293	-.542	-.171
Sustainability_FutureChallenges	.019	.092	.179	-.043	.839	-.044

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 9 iterations.

Rotated Component Matrix contains estimates of the correlations between each of the variables and the estimated components. The values represent the strength of ownership of factors to the overall component. Here, 4 strong groups have emerged with most parameters categorized under them. For example, Group 1 (or Component 1) contains parameters of “Relevance_SERCsInvolvement”, “Relevance_SERCsResources”, “Relevance_SERCsChallenges”, “Efficiency_TimelyCommunication”, “Effectiveness_SERCsInvolvement”, and “Effectiveness_SERCsFeedback”.

Grouping of parameters thus determined through Factor Analysis (Principal Components) has been shown below. Each evaluation criteria has been assigned a colour for better visualization of distribution of parameters.

Relevance
Efficiency
Effectiveness

Impact
Sustainability

Table 20: Grouping of parameters – All responses

Group 1	Group 2	Group 3	Group 4
SERC Involvement and Consideration	Alignment of Studies with SERC functions	Quality & Comprehensiveness of Studies	Applicability of Studies
Relevance: SERCs Involvement	Relevance: Relevance of Topics	Effectiveness: Quality of Research	Effectiveness: State Suitability of Recommendations
Relevance: Consideration of SERC Resources	Relevance: Relevance of SERC Issues	Effectiveness: Report Structure and Clarity	Effectiveness: Cost Effectiveness of Recommendations
Relevance: Consideration of SERCs Challenges	Effectiveness: Incorporating Stakeholder Concerns	Effectiveness: Including International Cases	Effectiveness: Consideration of Technology Aspect
Efficiency: Timely Communication from FOR	Effectiveness: Quality of Analysis	Effectiveness: Including National Cases	Impact: Contribution to Issue Resolution
Effectiveness: SERCs Involvement in Providing Inputs	Effectiveness: Feasibility of Recommendations	Impact: Increase in Awareness	
Effectiveness: SERCs Involvement in Finalizing Studies	Impact: Enhancing National View	Impact: Enhancing Global View	
		Impact: Contribution to Regulations	

As can be observed, all parameters fall into 4 major groups which can be named as: SERC Involvement and Consideration, Alignment of Studies with SERC functions, Quality & Comprehensiveness of Studies, and Applicability of Studies. Thus, these overarching parameters hold primary importance for SERCs, within which various parameters can be delineated.

Similar analysis has been undertaken for various cross sections (Type of Study, Designation levels and Regions), as follows:

Table 21: Grouping of parameters - Commercial Studies

Group 1	Group 2	Group 3	Group 4
Comprehensiveness of Studies	SERC Involvement and Consideration	-	Applicability of Studies
Relevance: Relevance of Topics	Relevance: SERCs Involvement	Efficiency: Adequate Allocation of Time	Effectiveness: Feasibility of Recommendations
Relevance: Relevance of SERC Issues	Relevance: Consideration of SERC Resources	Effectiveness: SERCs Involvement in Finalizing Studies	Effectiveness: State Suitability of

Group 1	Group 2	Group 3	Group 4
			Recommendations
Effectiveness: Quality of Analysis	Relevance: Consideration of SERCs Challenges	Effectiveness: Cost Effectiveness of Recommendations	
Effectiveness: Quality of Research	Efficiency: Timely Communication from FOR	Impact: Contribution to Issue Resolution	
Effectiveness: Consideration of Technology Aspect	Effectiveness: SERCs Involvement in Providing Inputs	Sustainability: Withstanding future challenges	
Effectiveness: Including National Cases	Effectiveness: Incorporating Stakeholder Concerns		
Impact: Increase in Awareness			
Impact: Enhancing Global View			
Impact: Enhancing National View			
Impact: Contribution to Regulations			

Table 22: Grouping of parameters - Technical Studies

Group 1	Group 2	Group 3	Group 4
SERC Involvement and Consideration	Comprehensiveness of Studies	Applicability of Studies	Alignment of Studies with SERC functions
Relevance: SERCs Involvement	Effectiveness: Quality of Analysis	Effectiveness: Quality of Research	Relevance: Relevance of Topics
Relevance: Consideration of SERC Resources	Effectiveness: Feasibility of Recommendations	Effectiveness: State Suitability of Recommendations	Relevance: Relevance of SERC Issues
Efficiency: Timely Communication from FOR	Effectiveness: Consideration of Technology Aspect	Effectiveness: Report Structure and Clarity	Efficiency: Adequate Allocation of Time
Effectiveness: SERCs Involvement in Providing Inputs	Impact: Enhancing Global View	Impact: Increase in Awareness	
Effectiveness: SERCs Involvement in Finalizing Studies	Impact: Enhancing National View	Impact: Contribution to Issue Resolution	
Effectiveness: Incorporating Stakeholder Concerns	Impact: Contribution to Regulations		
	Effectiveness: Including National Cases		

Table 23: Grouping of parameters - Consumer Studies

Group 1	Group 2	Group 3	Group 4	Group 5
SERC Involvement and	Comprehensivenes	Applicability of	Alignment to ground-	Alignment of Studies

Group 1	Group 2	Group 3	Group 4	Group 5
Consideration	s of Studies	Studies	level issues	with SERC functions
Relevance: SERCs Involvement	Efficiency: Adequate Allocation of Time	Effectiveness: Feasibility of Recommendations	Effectiveness: State Suitability of Recommendations	Relevance: Relevance of Topics
Relevance: Consideration of SERC Resources	Effectiveness: Quality of Analysis	Impact: Enhancing Global View	Effectiveness: Cost Effectiveness of Recommendations	Relevance: Relevance of SERC Issues
Relevance: Consideration of SERCs Challenges	Effectiveness: Quality of Research	Impact: Enhancing National View	Impact: Contribution to Issue Resolution	Effectiveness: Report Structure and Clarity
Efficiency: Timely Communication from FOR	Effectiveness: Including National Cases			
Effectiveness: SERCs Involvement in Providing Inputs	Impact: Increase in Awareness			
Effectiveness: SERCs Involvement in Finalizing Studies				

Table 24: Grouping of parameters - Renewable, DSM & Efficiency Studies

Group 1	Group 2	Group 3	Group 4
SERC Involvement and Consideration	Comprehensiveness and Applicability	Alignment with SERC functions	Value Add
Relevance: SERCs Involvement	Relevance: Relevance of SERC Issues	Efficiency: Timely Communication from FOR	Effectiveness: Quality of Research
Relevance: Consideration of SERC Resources	Effectiveness: Consideration of Technology Aspect	Effectiveness: Feasibility of Recommendations	Impact: Enhancing Global View
Relevance: Consideration of SERCs Challenges	Effectiveness: Report Structure and Clarity	Effectiveness: State Suitability of Recommendations	
Effectiveness: SERCs Involvement in Providing Inputs	Effectiveness: Including National Cases	Effectiveness: Cost Effectiveness of Recommendations	
Effectiveness: SERCs Involvement in Finalizing Studies	Impact: Increase in Awareness	Effectiveness: Including International Cases	
	Impact: Contribution to Regulations		
	Impact: Contribution to Issue Resolution		

Table 25: Grouping of parameters - Other Studies

Group 1	Group 2	Group 3
Comprehensiveness and Applicability	SERC Involvement and Consideration	Global Outlook
Relevance: Relevance of Topics	Relevance: SERCs Involvement	Effectiveness: Including International Cases
Effectiveness: Quality of Analysis	Relevance: Relevance of SERC Issues	Impact: Enhancing Global View
Effectiveness: Quality of Research	Relevance: Consideration of SERC Resources	
Effectiveness: Feasibility of Recommendations	Relevance: Consideration of SERCs Challenges	
Effectiveness: State Suitability of Recommendations	Efficiency: Timely Communication from FOR	
Effectiveness: Consideration of Technology Aspect	Effectiveness: SERCs Involvement in Providing Inputs	
Effectiveness: Including National Cases		
Impact: Increase in Awareness		
Impact: Enhancing National View		
Impact: Contribution to Regulations		
Impact: Contribution to Issue Resolution		

Table 26: Grouping of parameters - Chairman & Member

Group 1	Group 2	Group 3	Group 4	Group 5
State Suitability	SERC Involvement and Consideration		Alignment to SERC functions	Study Outcomes
Efficiency: Timely Communication from FOR	Relevance: Consideration of SERC Resources	Relevance: SERCs Involvement	Relevance: Relevance of Topics	Effectiveness: Report Structure and Clarity
Effectiveness_SERCs Feedback	Relevance: Consideration of SERCs Challenges	Efficiency: Adequate Allocation of Time	Relevance: Relevance of SERC Issues	Impact: Increase in Awareness
Effectiveness: Quality	Effectiveness: SERCs Involvement in	Effectiveness: Incorporating	Effectiveness: Including National	Impact: Enhancing

Group 1	Group 2	Group 3	Group 4	Group 5
of Analysis	Providing Inputs	Stakeholder Concerns	Cases	Global View
Effectiveness: State Suitability of Recommendations	Effectiveness: Feasibility of Recommendations	Effectiveness: Quality of Research	Impact: Contribution to Regulations	Impact: Enhancing National View
Effectiveness: Cost Effectiveness of Recommendations		Effectiveness: Consideration of Technology Aspect		
Effectiveness: Including International Cases		Impact: Contribution to Issue Resolution		

Table 27: Grouping of parameters - Secretary

Group 1	Group 2	Group 3	Group 4	Group 5
SERC Involvement and Consideration	Value Add and Applicability of Studies	Alignment to SERC functions	Comprehensiveness and Quality of Studies	Global Outlook
Relevance: SERCs Involvement	Effectiveness: Cost Effectiveness of Recommendations	Relevance: Relevance of Topics	Effectiveness: Quality of Research	Effectiveness: Including International Cases
Relevance: Consideration of SERC Resources	Effectiveness: Consideration of Technology Aspect	Relevance: Relevance of SERC Issues	Effectiveness: State Suitability of Recommendations	Impact: Enhancing Global View
Relevance: Consideration of SERCs Challenges	Impact: Increase in Awareness	Effectiveness: Quality of Analysis	Effectiveness: Report Structure and Clarity	
Efficiency: Timely Communication from FOR	Impact: Contribution to Regulations	Effectiveness: Feasibility of Recommendations	Effectiveness: Including National Cases	
Effectiveness: SERCs Involvement in Providing Inputs	Impact: Contribution to Issue Resolution	Impact: Enhancing National View		
Effectiveness: SERCs Involvement in Finalizing Studies				

Table 28: Directors & Below

Group 1	Group 2	Group 3
SERC Involvement, Quality of Report	Alignment to SERC functions	-
Relevance: SERCs Involvement	Effectiveness: Feasibility of Recommendations	Effectiveness: Quality of Research
Relevance: Relevance of SERC Issues	Effectiveness: State Suitability of Recommendations	Effectiveness: Report Structure and Clarity
Relevance: Consideration of SERC Resources	Effectiveness: Cost Effectiveness of Recommendations	Sustainability: Withstanding future challenges
Relevance: Consideration of SERCs Challenges	Effectiveness: Consideration of Technology Aspect	
Efficiency: Timely Communication from FOR	Effectiveness: Including International Cases	
Effectiveness: SERCs Involvement in Providing Inputs		
Effectiveness: SERCs Involvement in Finalizing Studies		
Effectiveness: Incorporating Stakeholder Concerns		
Effectiveness: Quality of Analysis		
Effectiveness: Including National Cases		
Impact: Enhancing Global View		
Impact: Enhancing National View		
Impact: Contribution to Regulations		
Impact: Contribution to Issue Resolution		

Table 29: Grouping of parameters - East

Group 1	Group 2	Group 3	Group 4	Group 5
Comprehensiveness and Applicability	Applicability of studies		Involvement and consideration	
Relevance: Relevance of Topics	Relevance: Consideration of SERCs Challenges	Effectiveness: State Suitability of Recommendations	Efficiency: Timely Communication from	Relevance: SERCs Involvement

Group 1	Group 2	Group 3	Group 4	Group 5
			FOR	
Relevance: Relevance of SERC Issues	Effectiveness: Cost Effectiveness of Recommendations	Effectiveness: Including International Cases	Effectiveness: SERCs Involvement in Providing Inputs	Effectiveness: Quality of Research
Effectiveness: SERCs Involvement in Finalizing Studies		Impact: Contribution to Regulations		Relevance: Consideration of SERC Resources
Effectiveness: Quality of Analysis		Impact: Contribution to Issue Resolution		
Effectiveness: Feasibility of Recommendations				
Effectiveness: Consideration of Technology Aspect				
Effectiveness: Report Structure and Clarity				
Effectiveness: Including National Cases				
Impact: Increase in Awareness				
Impact: Enhancing Global View				
Impact: Enhancing National View				

Table 30: Grouping of parameters - North East

Group 1	Group 2	Group 3	Group 4
Comprehensiveness and Applicability	SERC Involvement and Consideration	Value Add	Applicability of Studies
Relevance: Relevance of Topics	Relevance: SERCs Involvement	Effectiveness: Cost Effectiveness of Recommendations	Impact: Increase in Awareness
Relevance: Relevance of SERC Issues	Relevance: Consideration of SERC Resources	Effectiveness: Consideration of Technology Aspect	Sustainability: Withstanding future challenges
Effectiveness: Quality of	Relevance: Consideration	Effectiveness: Report	

Group 1	Group 2	Group 3	Group 4
Analysis	of SERCs Challenges	Structure and Clarity	
Effectiveness: Quality of Research	Efficiency: Timely Communication from FOR	Impact: Contribution to Regulations	
Effectiveness: Feasibility of Recommendations	Effectiveness: SERCs Involvement in Providing Inputs		
Effectiveness: State Suitability of Recommendations	Effectiveness: SERCs Involvement in Finalizing Studies		
Effectiveness: Including National Cases	Effectiveness: Including International Cases		
Impact: Enhancing Global View			
Impact: Enhancing National View			
Impact: Contribution to Issue Resolution			

The major groupings observed from cross-sectional analysis have been summarized in the following table.

Table 31: Grouping of parameters across each cross-section

	Group 1	Group 2	Group 3	Group 4	Group 5
Subset	SERC Involvement and Consideration	Alignment of Studies with SERC functions	Quality and Comprehensiveness of Studies	Applicability of Studies	Value Add
Commercial					
Technical					
Consumer					
Renewable, DSM					
Others					
Chairman, Mem.					
Secretary					
Directors & below					
East					
North-East					

As observed, the overarching parameters of SERCs' involvement and consideration, quality and comprehensiveness of Studies, and applicability of Studies are most common, while other groupings of alignment with SERC functions and Value add have also been formed for certain sample sets.

5.4.3. Determining the most differentiating parameters

One of the key objectives of this assignment was to assess how impactful and sustainable the Studies have been. It is also thus useful to undertake Discriminant Analysis to identify parameters that most differentiate/ discriminate between the sets of respondents who have given different ratings for Impact and Sustainability.

***Discriminant function analysis** is useful in determining whether a set of variables is effective in predicting category membership*

The outcome of **Discriminant Analysis** has been shown below for understanding the process of analysis.

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	3.219[a]	72.8	72.8	.873
2	1.202[a]	27.2	100.0	.739

a. First 2 canonical discriminant functions were used in the analysis.

An eigenvalue in discriminant analysis is the characteristic root of each function. It is an indication of how well that function differentiates the groups, where the larger the eigenvalue, the better the function differentiates. Here, Function 1 has a greater eigenvalue and should be considered further.

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 2	.108	110.345	52	.000
2	.454	39.083	25	.036

Wilks' Lambda test is to test which variable contribute significance in discriminant function. The closer Wilks' lambda is to 0, the more the variable contributes to the discriminant function.

Standardized Canonical Discriminant Function Coefficients

	Function	
	1	2
Relevance_Topics	.145	.286
Relevance_SERCsInvolvement	.251	.945
Relevance_SERCsIssues	.062	.223
Relevance_SERCsResources	.048	-.899
Relevance_SERCsChallenges	-.144	-.931
Efficiency_TimeAllocation	.173	.533
Efficiency_TimelyCommunication	-.191	-.003

Effectiveness_SERCsInvolvement	-.067	.377
Effectiveness_SERCsFeedback	-.075	-.046
Effectiveness_StakeholderConcerns	.038	-.119
Effectiveness_Analysis	-.251	-.730
Effectiveness_Research	.307	.250
Effectiveness_Feasibility	.275	-.248
Effectiveness_StateSuitability	.281	-.390
Effectiveness_CostEffectiveness	-.162	.611
Effectiveness_Technology	-.324	-.026
Effectiveness_ReportStructure	-.425	-.172
Effectiveness_International	.160	.434
Effectiveness_National	.624	-.387
Impact_Awareness	.380	.738
Impact_GlobalView	.189	.254
Impact_NationalView	.144	.342
Impact_Regulations	.084	.128
Impact_IssueResolution	.166	-.416
Sustainability_FORIntervention	-.272	-.190
Sustainability_FutureChallenges	-.150	-.130

The standardized coefficients allow you to compare variables measured on different scales. Coefficients with large absolute values correspond to variables with greater discriminating ability.

Structure Matrix

	Function	
	1	2
Effectiveness_National	.653*	-.050
Effectiveness_Research	.520*	.008
Effectiveness_Analysis	.437*	-.094
Impact_NationalView	.426*	-.079
Impact_Awareness	.407*	.329
Effectiveness_Feasibility	.407*	-.319
Impact_GlobalView	.394*	.056
Impact_IssueResolution	.379*	-.060
Effectiveness_StateSuitability	.367*	-.166
Relevance_SERCsIssues	.340*	-.001
Effectiveness_International	.320*	.242
Impact_Regulations	.318*	.023

Effectiveness_ReportStructure	.263*	.073
Effectiveness_StakeholderConcerns	.262*	.007
Relevance_Topics	.226*	.050
Effectiveness_Technology	.226*	.090
Relevance_SERCsInvolvement	.205*	-.034
Relevance_SERCsResources	.197*	-.156
Sustainability_FORIntervention	-.193*	.097
Effectiveness_SERCsInvolvement	.178*	-.149
Effectiveness_SERCsFeedback	.174*	-.013
Efficiency_TimeAllocation	.144*	.101
Effectiveness_CostEffectiveness	.143*	.033
Sustainability_FutureChallenges	.141*	-.070
Efficiency_TimelyCommunication	.106*	-.011
Relevance_SERCsChallenges	.214	-.308*

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

*. Largest absolute correlation between each variable and any discriminant function

The structure matrix reveals the correlations between each variable in the model and the discriminant functions. Essentially, they are factor loadings of the variables on each discriminant function. Tabachnick and Fidell (2014) recommend ignoring factor loadings with an absolute value less than 0.32 (representing 10% of the shared variance). Here, we have ignored factors in Function 1 with factor loadings less than 0.4 (representing 16% of variance).

Functions at Group Centroids

Overall_Impact	Function	
	1	2
3	-1.935	.567
4	.960	-.799
5	4.182	3.310

Unstandardized canonical discriminant functions evaluated at group means

Functions at Group Centroids are the means of the discriminant function scores by group for each function calculated. The farther apart the means are, the less error there will be in classification. Here, the centroids for Overall Impact values of 3, 4 and 5 are significantly far apart, and thus indicate healthy discrimination of given factors.

On the basis of the given outcomes, the results of discriminant analysis have been summarized below.

Parameters which discriminate between Overall Impact rating of 3, 4 and 5

Structure Matrix	
Most Discriminating Parameters	Absolute size of correlation with function
Effectiveness – Incorporation of National Case Studies	0.653
Effectiveness – Quality of Research	0.520
Effectiveness – Quality of Analysis	0.437
Impact – Enhancing national outlook	0.426
Impact – Enhancing knowledge base and awareness	0.407

As can be observed, Effectiveness and Impact parameters which are responsibility for Quality of Studies are most discriminating in rating of Overall Impact of Studies.

Parameters which discriminate between Overall Sustainability rating of 3, 4 and 5

Structure Matrix	
Most Discriminating Parameters	Absolute size of correlation with function
Effectiveness – Incorporation of National Case Studies	0.440
Impact – Contribution of Studies to formulation of regulations	0.436
Impact – Contribution of Studies to actual resolution of issues	0.429
Relevance – Relevance of Study topics to issues faced by SERCs	0.406
Effectiveness – Incorporation of Stakeholder Concerns	0.404

Effectiveness and Impact parameters which are responsibility for key outputs (formulation of regulations and resolution of issues) are most discriminating in rating of Overall Sustainability of Studies.

5.5. Qualitative Responses

Qualitative responses were also received from SERCs for various types of Studies. While many recurring concerns were voiced, specific concerns relevant to various types of Studies were also provided.

Recurring feedback has thus been grouped under two major heads: Feedback regarding Involvement of SERC personnel in conduct of Studies, and feedback regarding Quality of Studies, as outlined below.

5.5.1. General feedback from SERCs

Ensuring greater involvement of SERC personnel in conduct of Studies

Personnel from various SERCs have provided feedback on various types of Studies, stressing on the need for:

- Greater involvement of SERC personnel in conduct of Studies
- Involving SERCs and other stakeholders to make studies easier to adopt and implement
- Involving SERC officers for state-level inputs as well as for their capacity building
- Appointing officers as per expertise to a monitoring cell to aid FOR in execution of certain Studies
- Organizing workshops relevant to studies – more residential programs with at least one field visit
- Instituting a platform to interact with other ERCs, with more interactive and brainstorming sessions
- Thorough discussions with consultants required from the beginning
- Ensuring involvement of experienced personnel from SERCs
- Involving senior staff for finalization of studies to improve quality of studies
- Selecting topics in more scientific manner

Enhancing quality of studies

- Incorporating state-specific data and scenarios to improve quality of studies and provide clarity for decision making, especially for forward-looking studies
- Incorporating point of view of smaller states
- Legal aspects may be incorporated; case studies on legal issues also required.
- Analysis can be more objective with a viable number of limited alternatives
- Updating data at regular intervals should be explored
- Geographical and climactic variations should be incorporated
- A few studies are medium term in sustainability, and with many changes pending in the power sector, states are inclined to adopt a wait and watch approach

5.5.2. Specific feedback for each type of Study

Type of Study	Observations/Feedback
Technical	• A strong policy of the government may be required for effective control of the AT&C losses which continue to pose a big threat to the power sector. • More emphasis should be given on un-metered Ag connections and improvement in losses. • Push from Central Govt. for conducting/implementing the study on pilot basis in selected areas. • It would be beneficial for the state if executing agencies can come and advise on how to go about the implementation.
Consumer	• Other topics for the benefit of the consumers may be considered (supply code, performance standards, and improvements in current regulations, etc.)

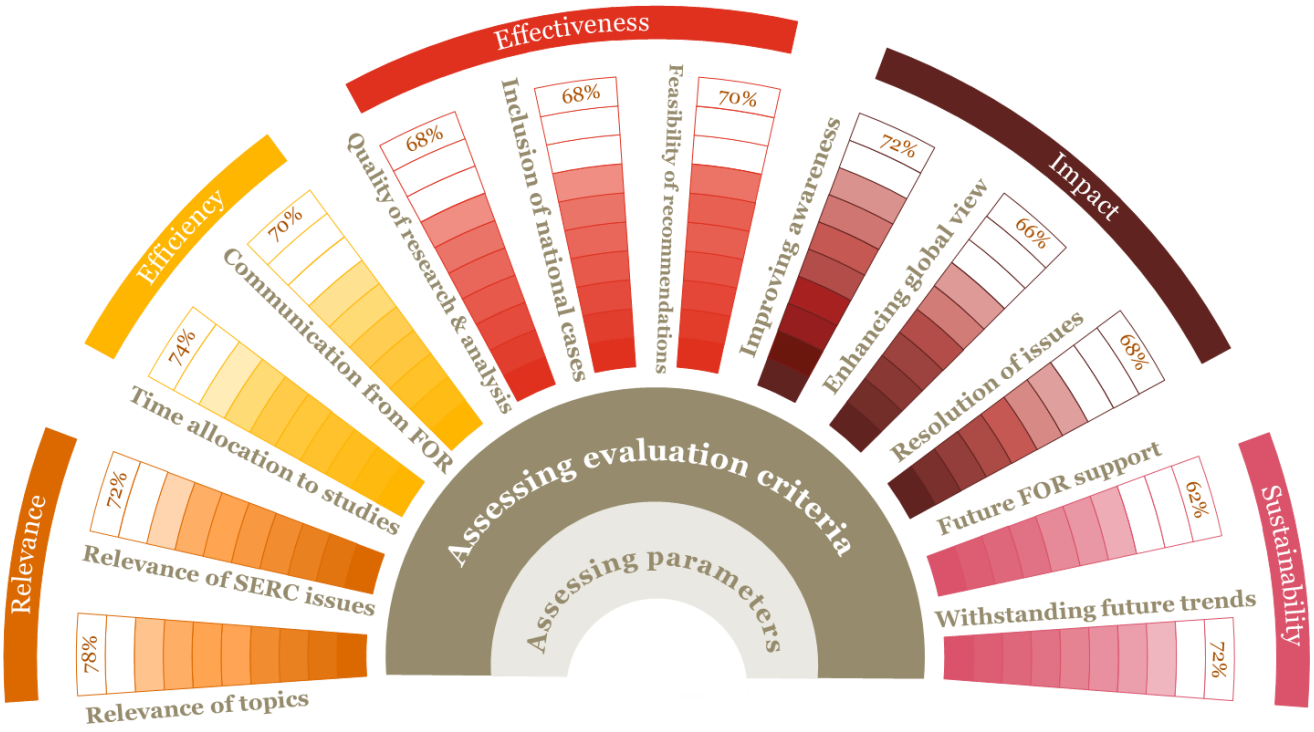
Type of Study	Observations/Feedback
Renewable & DSM	• Implementation issues exist due to lack of suitable staff at SERC's; capacity building required with the medium of studies and greater involvement • Direct help in preparation of Regulations
Other Sector Reforms	• Recommendations could be more specific; too many alternatives make the study more subjective and focus is lost. • Recommendations are currently more suited to bigger states

The given qualitative feedback has been assessed in conjunction with quantitative feedback and formalized into insights as provided in the following section.

5.6. Summary of analysis results

The assessment of responses produced multiple insights and learnings from various types of Ratings and Statistical analysis. While Ratings analysis allowed a close look at each parameter and Evaluation Criteria individually, Statistical analysis allowed a broad look at the relationship between low and high level parameters. The results of the two types of analysis have been combined and depicted in the following diagram, wherein the average ratings of the most significant/critical parameters as perceived by respondents are shown.

Figure 17: Average Ratings of Parameters - Studies



Parameters rated below 70% (average rating 3.5/5) indicate scope of improvement, while parameters rated over 70% indicate existing areas of strength that can be further improved.

5.6.1. Assessment of survey parameters across Study lifecycle

Ratings analysis was undertaken to comprehensively assess the ratings of all parameters across the lifecycle of Studies. The insights derived from this analysis have been summarized in accordance with 3 broad stages of a lifecycle – Planning, Execution and Application Stage.

Figure 18: Summary of Ratings Analysis - FOR Studies

Planning Stage	Execution Stage	Application Stage
•Constant coordination with SERCs for feedback	•Coverage of implementation requirements	•Support for implementation of recommendations
•Due consideration of state-level constraints	•Coverage of global perspective	•Enhancing Capacity Building of SERC personnel
•Consideration of SERC resources and capabilities	•Coverage of possible scenarios	

Planning Stage: *Need to improve involvement of SERCs*

- Greater involvement of SERCs is sought in determination of study topics, providing inputs for Study content, and finalization and review of Studies
- Greater consideration of state-level constraints (particularly for the states of Central and North-East India) from the planning stages itself
- Consideration of SERC resources and capabilities and aiding SERC Chairman & Member in planning for the same

Execution Stage: *Need to enhance depth and coverage of Study reports*

- Improvement sought in State Suitability, Cost Effectiveness and Incorporation of Technology, particularly in Technical and Renewable Studies
- More international cases and examples sought, particularly in Commercial and Consumer Studies
- Providing scenarios as per different states with varying challenges, particularly for smaller states

Application Stage: *Need to make Studies easier to adopt and implement*

- More handholding required for Studies covering new domains, particularly for Renewable Studies and Other Sector Studies
- More interactions and sessions with SERC personnel to enhance their knowledge & capacity to implement

5.6.2. Assessing criticality of parameters as perceived by SERCs

Statistical analysis was undertaken to identify the most critical and influential variables out of the wide spectrum of survey parameters used. The insights derived from this exercise have thus been summarized below:

Figure 19: Summary of Statistical Analysis - FOR Studies

Most significant parameters	Overarching criteria for successful studies	Making studies more impactful
•Relevance of study topics and their relation to current issues •Regular and meaningful communication by FOR •Coverage of essential aspects in Study reports •Inclusion of national and global perspective •Sustainability of recommendations	•Involvement and consideration of SERCs inputs at each stage •Comprehensiveness of studies •Contribution to SERC functions and regulations •Value addition of technology and investment aspects	•Constant enhancement of quality, coverage and depth of Studies •Greater orientation of recommendations towards SERC functions, capabilities and outputs

Most significant parameters: *Parameters that hold utmost importance for SERCs*

- Relevance of study topics and their relation to current issues being faced by SERCs are regarded as the most significant parameters for Studies to be perceived as relevant to SERC functions.
- Timely Communication by FOR for feedback and inputs, as well as allocation of adequate time to Studies regarded as crucial for Studies to have been efficiently conducted.
- All parameters that make reports comprehensive regarded crucial for Studies to be effective.
- Learning from model national and global case studies also considered crucial for providing depth to Studies.
- Ability of studies to withstand future challenges regarded significant for Studies to be sustainable and relevant in the long run.

Overarching criteria for successful studies: *Broad parameters that encompass all others*

- Involvement and consideration of SERCs inputs at each stage is considered as a primary concern, allowing greater alignment with their needs and challenges
- Comprehensiveness of studies that makes them reliable material for resolution of issues is also considered as a major criteria that encompasses all essential aspects of a Study
- Applicability of studies as per state specific challenges considered a crucial criteria for fulfilment
- Value addition through global outlook, technology perspective, etc. also considered as a broad parameter

Making studies more impactful and sustainable: *Focusing on parameters that make Studies more impactful and sustainable*

- Quality and comprehensiveness of studies has been perceived by SERCs to make studies more impactful
- Contribution to formation of regulations and issue resolution has been perceived to make studies more sustainable

6. Analysis of Responses – Capacity Building Progammes

6.1. Profile of Responses

A total of 15 responses were received for CBPs conducted by FOR from 14 respondents across 12 SERCs. A summary of the profile of responses is given below, while the complete list of respondents is provided in Annexure 1.2.

Table 32: Profile of Responses - FOR CBPs

Particulars	Number of respondents	Number of responses
Total	14	15
For each CBP		
5th CBP	6	6
6th CBP	4	4
7th CBP	1	1
8th CBP	2	2
9th CBP	2	2
For each region		
North	5	6
Central	4	4
East	0	0
North East	1	1
West	1	1
South	3	3
For each designation		
Chairman & Member	0	0
Secretary	1	1
Director & Below	13	14

As observed, a relatively small base of responses has been gathered for CBPs as compared to responses gathered for Studies. Hence, various types of analysis have been undertaken on the overall set of responses only and not on various cross sections of Designation Level and Region.

With the aid of qualitative responses that have been received from SERCs, useful insights were derived to back the results of analysis undertaken for CBPs. Additionally; feedback forms filled by Participants of CBPs have also been used to complement the analysis undertaken in this report.

6.2. Approach to analysis

A lifecycle approach had been chosen to determine the impact of FOR Studies and CBPs since it allows end-to-end assessment of the process and ensure that all relevant parameters are encompassed. With the help of this approach, a total of 35 parameters were tested in the form of survey questions from the respondents for FOR Studies.

To derive suitable insights from the wide variety of parameters, two types of tactics were followed: first, to analyze the ratings of all parameters comprehensively across the lifecycle of CBPs and identify strengths and weaknesses, and second, to identify the most critical parameters responsible for making CBPs more successful and impactful. The given tactics were thus executed with the aid of two types of analysis: Ratings analysis and Statistical Analysis, as depicted below:

Figure 20: Type of analysis undertaken – FOR CBPs

Rating Analysis *– how all parameters fared across CBP lifecycle*		
Ratings of evaluation criteria (Relevance, Efficiency, Effectiveness, Impact, Sustainability)	*Summary of parameter ratings (less than 3, between 3 & 3.5, greater than 3.5)*	*Overall mapping of Quality of CBPs V Impact of CBPs*

Statistical Analysis *– perceived criticality of parameters*	
Regression Analysis: *Most significant parameters under each evaluation criteria*	***Factor Analysis:*** *Grouping of parameters based on proximity of responses* - *Principal Components*

Ratings Analysis

1. **Ratings of evaluation criteria**
   - Ratings of all parameters under each Evaluation Criteria (Relevance, Efficiency, Effectiveness, Impact, Sustainability) were thoroughly assessed
   - Average ratings for all parameters within an Evaluation Criteria were determined, along with average ratings for each CBP
   - This analysis allows us to understand how each parameter has been distinctly perceived by the respondents
2. **Summary of parameter ratings**
   - All parameters were grouped in 3 groups: Group 1, with average rating higher than 3.5; Group 2, with average rating between 3 and 3.5; and Group 3, with average rating lesser than 3
   - This grouping informs us of which parameters have been consistently rated below par, at par and above par
3. **Overall mapping of Quality of CBPs V Impact of CBPs**
   - Two broad parameters were framed to depict how well the CBPs were conducted (Quality of CBPs), and how impactful the CBPs were (Impact of CBPs)

- Evaluation Criteria Relevance, Efficiency and Effectiveness were combined in a 1:1:2 ratio to determine Quality of CBPs and Impact and Sustainability were combined in a 1:1 ratio to determine the Impact of CBPs
- This mapping allows us to visualize the standing of each CBP individually as well as relative to each other on the Quality V Impact map

Statistical Analysis

4. Determining the most significant parameters

- Regression analysis was undertaken to identify the most significant parameters under each Evaluation Criteria which contributed to the overall rating for that Criteria
- This enables us to shortlist parameters that respondents perceive to be most critical for the success of each Evaluation Criteria

5. Discovering new groups of parameters

- Factor Analysis (Principal Components) was undertaken to identify new groups of parameters as per the proximity/similarity of response trends
- This allows the framing of new overarching parameters that respondents perceive should encompass the larger set of initial parameters

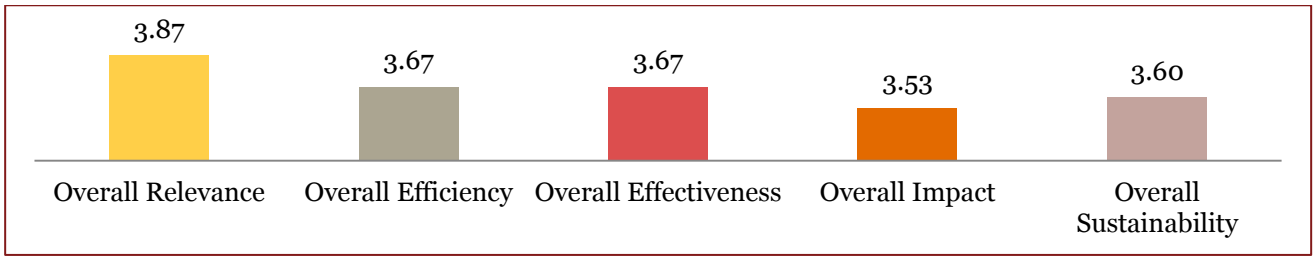
Since the base of responses received for CBPs was limited, Discriminant analysis was not feasible.

6.3. Ratings Analysis

To analyze the ratings of all parameters comprehensively across the lifecycle of CBPs, each evaluation criteria and its underlying parameters were methodically evaluated, as outlined in the following section.

6.3.1. Assessment of each evaluation criteria

Average ratings of the parameter for testing overall success of each Evaluation Criteria have been depicted below.

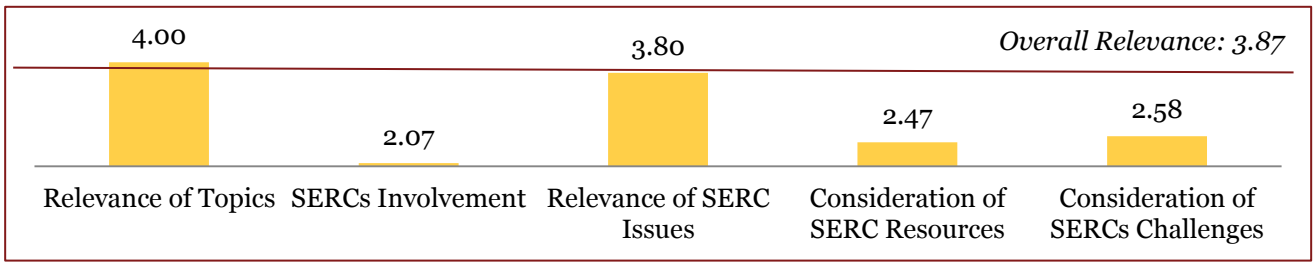


As observed, the Evaluation Criteria of Relevance has been rated relatively higher than others. SERCs perceive the topics covered in CBPs to be highly relevant to the functions of SERCs and the current issues being faced by them. On an overall basis, the conduct of CBPs and quality of programme content has been rated satisfactory. However, greater variation has been observed for the underlying parameters, described in the subsequent sections.

- As per the CBP feedback forms, a fairly high overall rating has been given for 7th and 8th CBP
- Participants seek more interactive formats of CBPs with longer duration, which include regular interactions, brainstorming discussions and field visits
- Allowing preparation for CBPs by providing background and material in advance
- Tailoring content to participants' profile (Director & Below) required

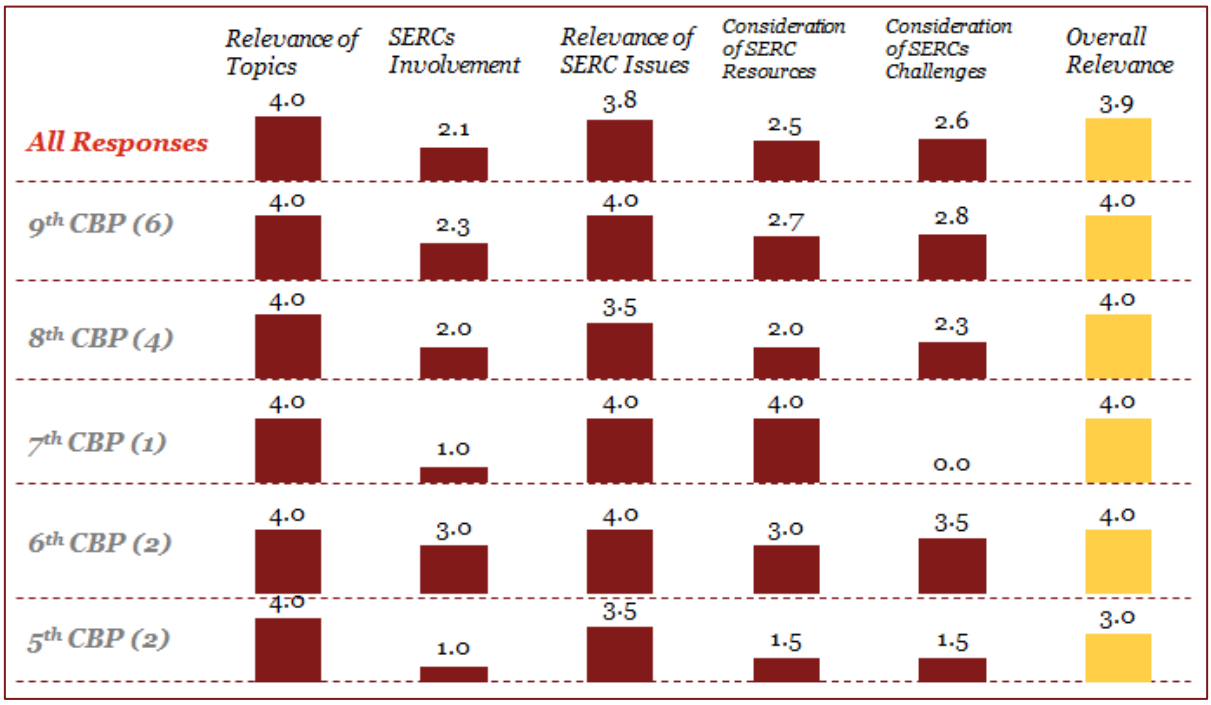
6.3.1.1. Relevance of CBPs

The average ratings of parameters under the Relevance Evaluation Criteria have been depicted below:



As also observed for Studies, SERCs are satisfied with the relevance of CBP topics and their relation to present issues being faced by SERCs. However, SERCs are less satisfied with the extent of their involvement in the planning stages of CBPs (specifically, for the determination of CBP topics), and perceive that consideration of state-level challenges (SERC resources and capabilities, and challenges faced by SERCs) at the planning stage is insufficient.

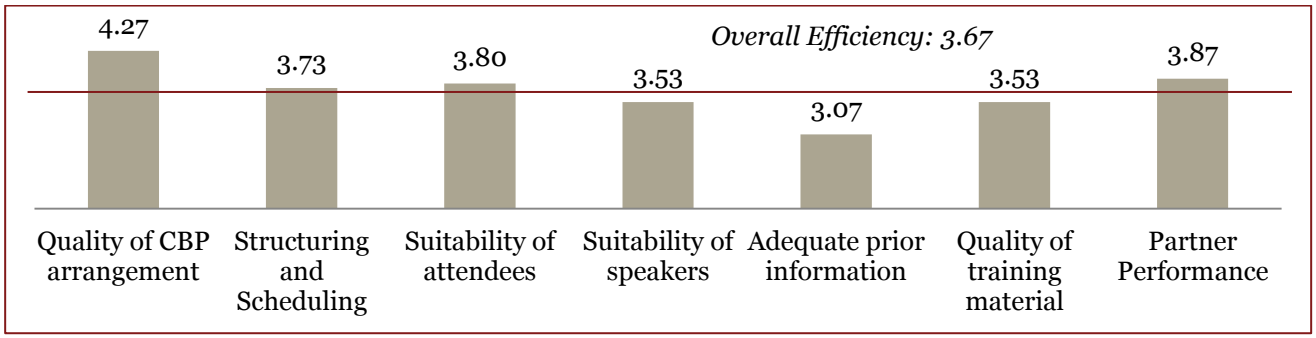
- The CBP feedback forms do not ask any question corresponding to planning of CBPs
- It has been indicated in qualitative responses that Programme material may be better suited to participants if they are involved in planning of CBP topics and content



As observed, the concern over SERC involvement in determination of CBP topics has remained consistent over the CBPs held in the past 5 years, though other parameters have shown marginal improvement from 8th to 9th CBP.

6.3.1.2. Efficiency in conduct of CBPs

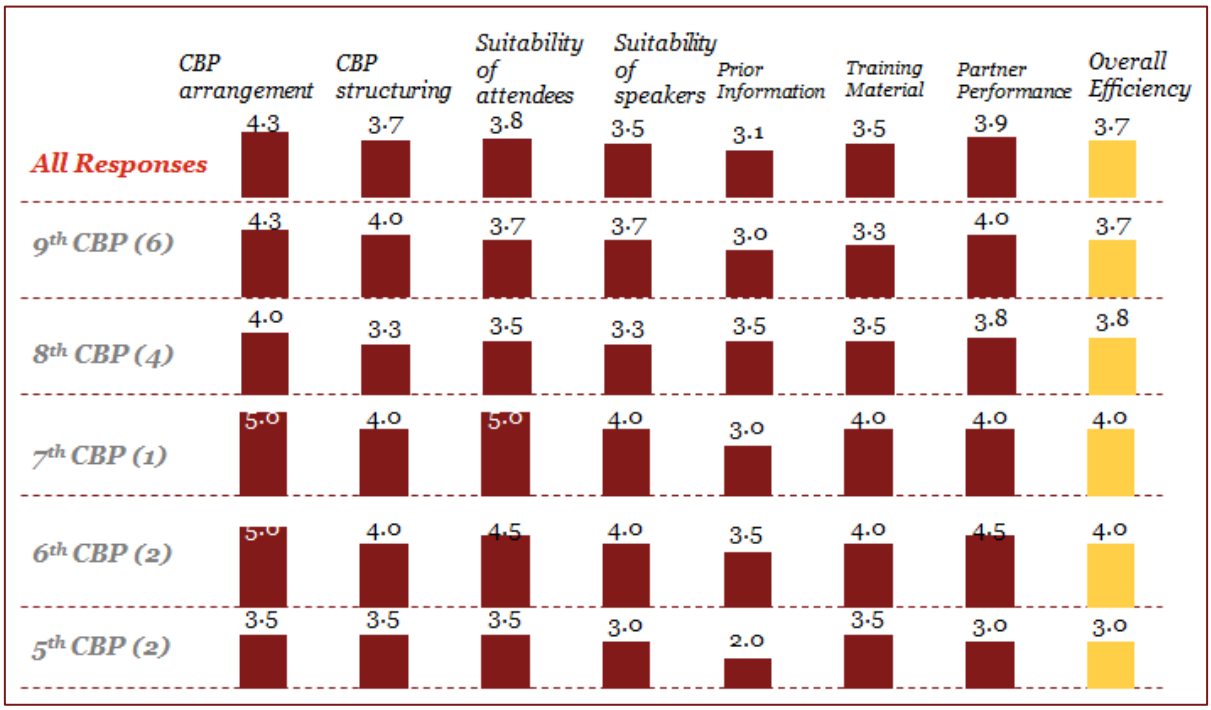
The average ratings of parameters under the Efficiency Evaluation Criteria have been depicted below:



While SERCs find CBP arrangement, CBP structuring and scheduling, suitability of attendees, and performance of execution partners commendable, information dissemination before CBPs was rated relatively lower.

As per CBP feedback forms:

- *Quality of Programme agenda & kit found to be quite satisfactory*
- *SERCs would like to be given more information about CBP topics so that they can get adequate time for preparation*
- *More days sought for CBPs, which could include interactive sessions and field visits*
- *Improvement sought in national and international views in the programme kit*

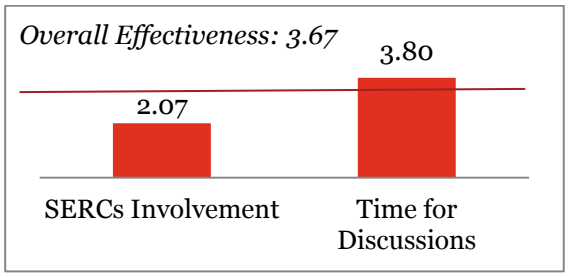


As observed, the parameter corresponding to sharing of prior information before CBPs was rated relatively lower across all CBPs. However, CBP arrangements and structuring have been perceived to improve from 8th to 9th CBP.

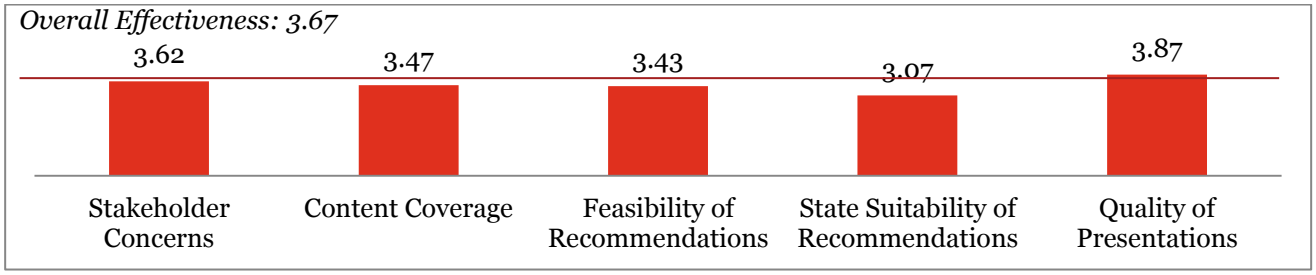
6.3.1.3. Effectiveness in conduct of CBPs

The average ratings of parameters under the Effectiveness Evaluation Criteria have been depicted below:

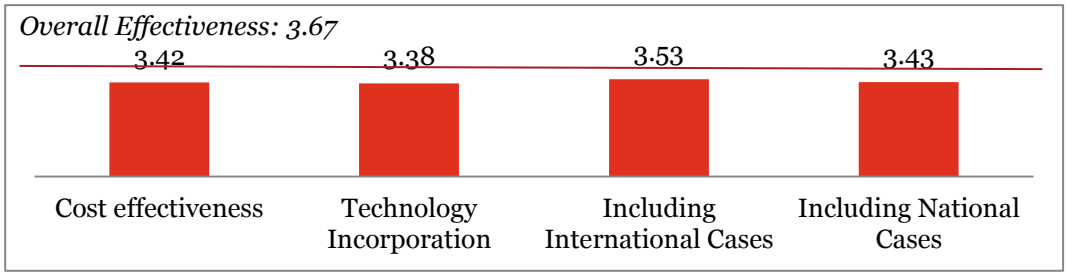
Involvement of SERCs



Quality of CBP Content



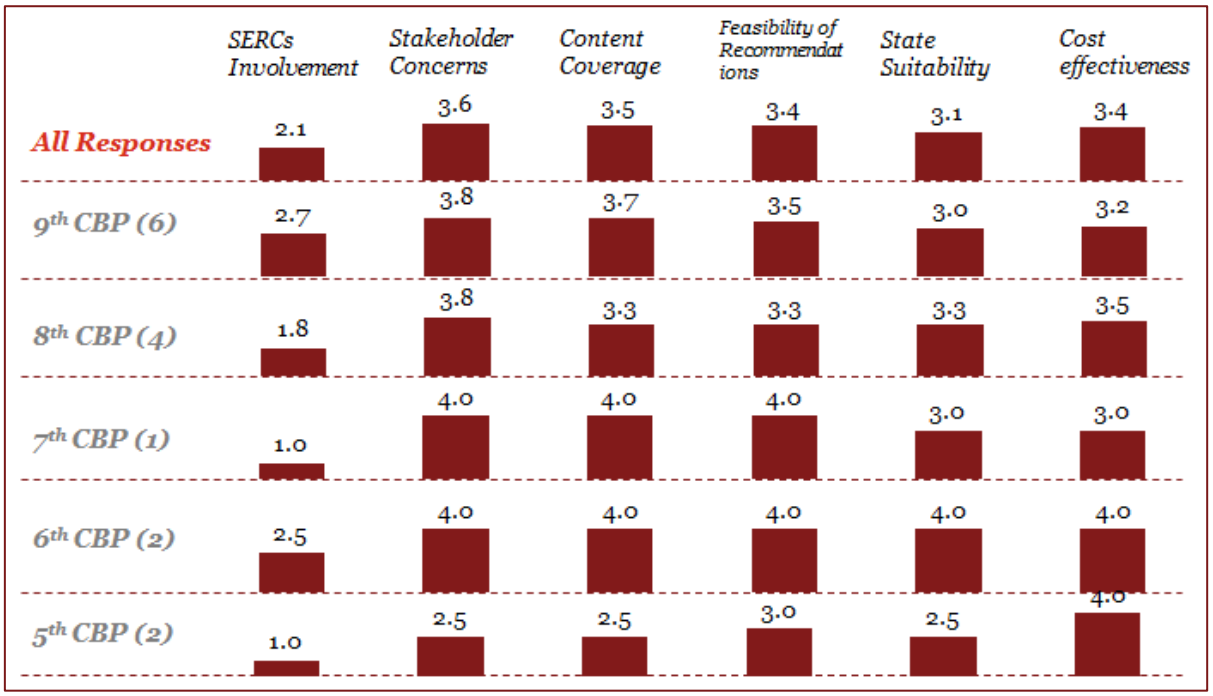
Value Add

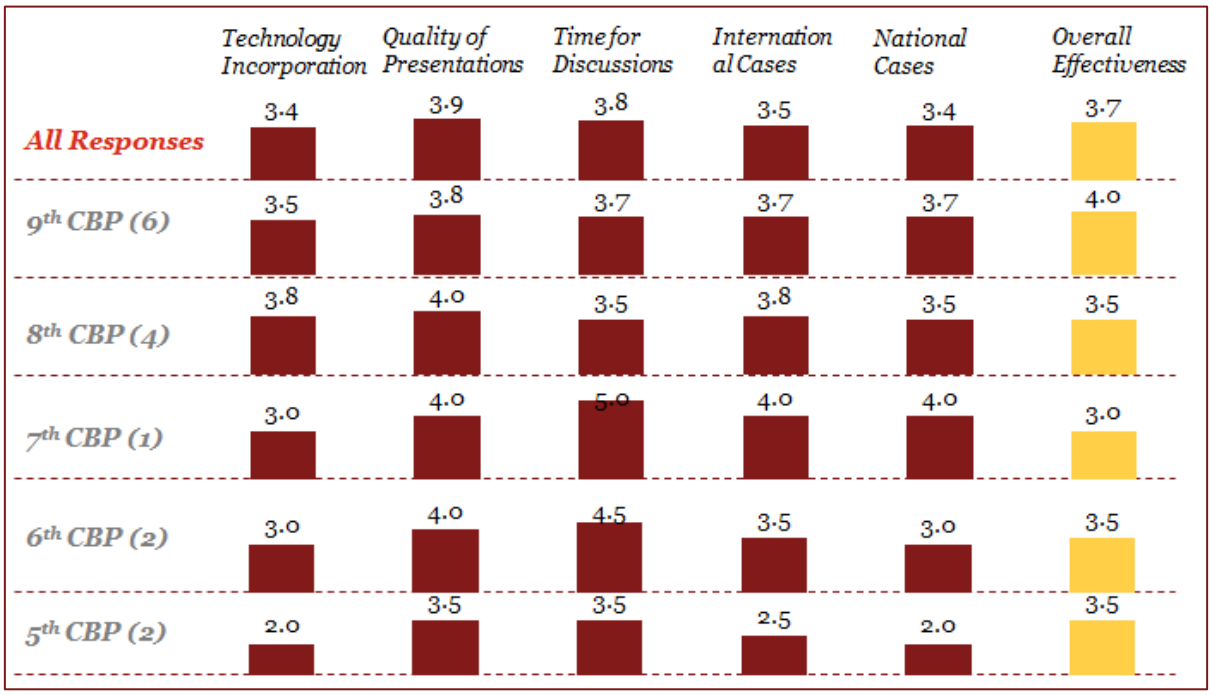


While the quality of content has been rated high, suitability to states has been rated relatively lower. As was observed for Studies, state involvement continues to be a concern in the development of CBP material.

As per CBP feedback forms:

- *International perspective can improve across domains*
- *Legal issue may also be addressed*
- *More focus could be given on South East Asian regulatory models*

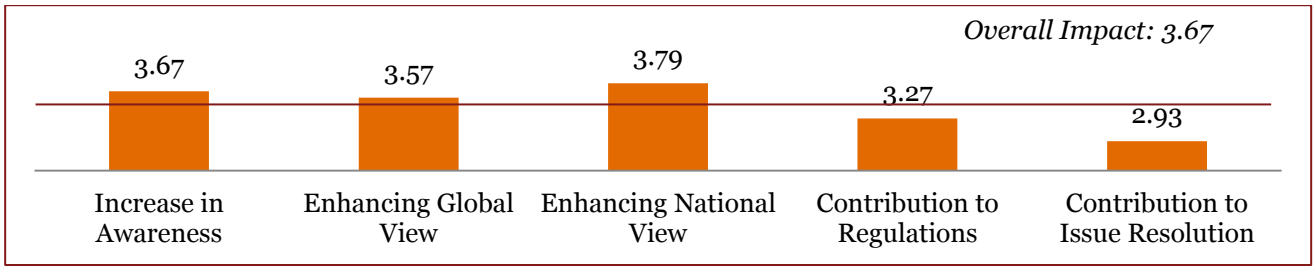




As can be observed, the ratings of value add parameters (state suitability and cost effectiveness of recommendations, technology incorporation) suggest scope of improvement.

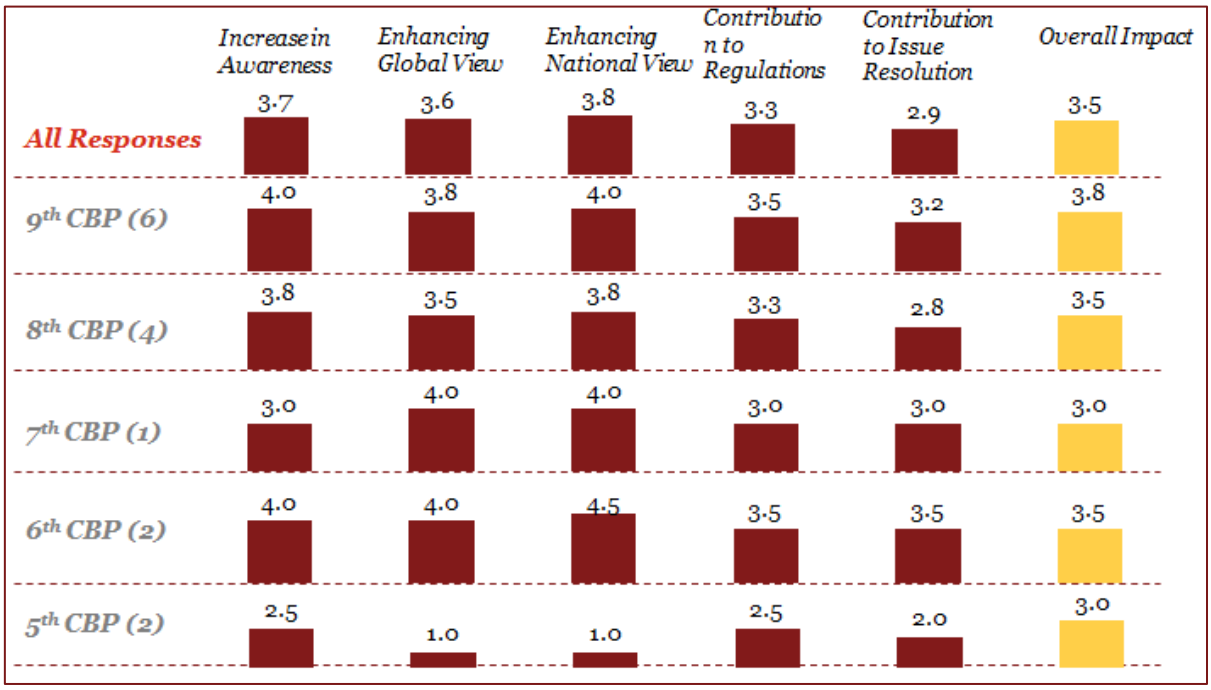
6.3.1.4. Impact of CBPs

The average ratings of parameters under the Impact Evaluation Criteria have been depicted below:



SERCs have valued the increase in awareness about prevailing issues, as well as supporting models in national and international context. However, it has been perceived that the impact of CBPs on SERC functions and outcomes has been moderate.

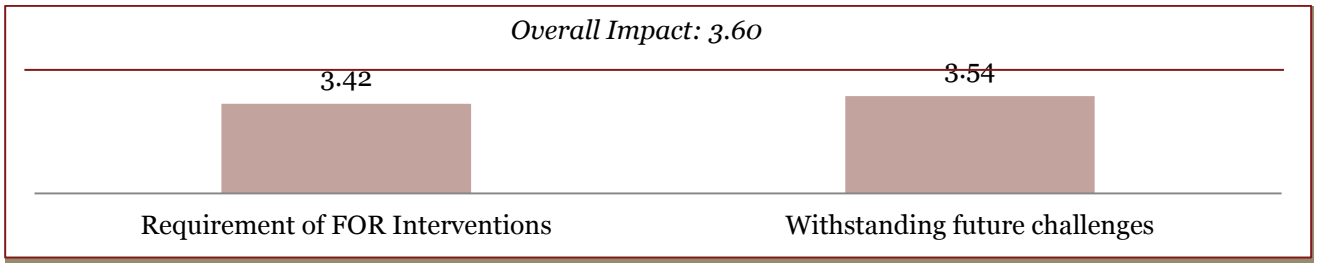
As per CBP feedback forms, selective participation of other stakeholders (FOR, MoP, Utilities) and discussions with them during CBPs will help in resolving prevailing issues.



As observed, 8th and 9th CBP have been rated high on the role of CBPs in increasing awareness about relevant issues. However, lack of follow up impact of CBPs has been felt across CBPs held in the past 5 years, as evident in relatively lower ratings of the parameters Contribution to Regulations and Contribution to Issue Resolution.

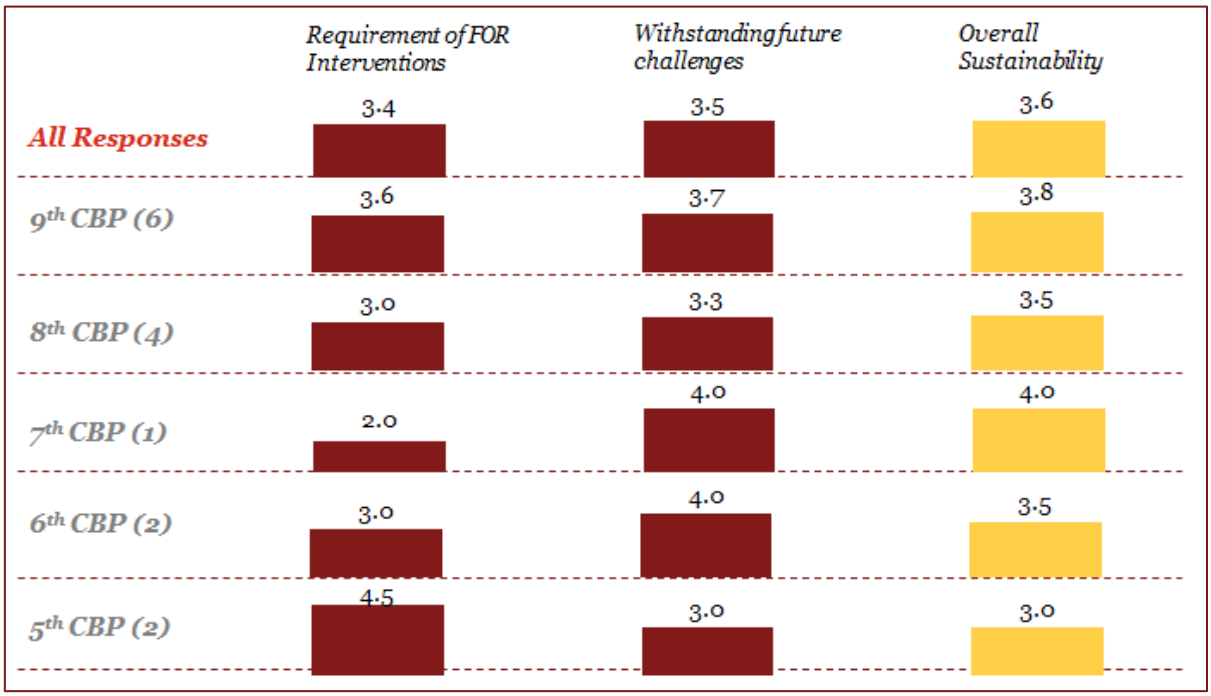
6.3.1.5. Sustainability of CBPs

The average ratings of parameters under the Sustainability Evaluation Criteria have been depicted below:



SERCs have considered CBP recommendations to be fairly sustainable in withstanding practical challenges in the future. On an overall basis, SERCs have also conveyed that moderate support will be required from FOR in the future for implementation of Studies (higher the rating, greater the self-sufficiency of the Study reports and lesser the support required from FOR.)

As per CBP feedback forms, CBP recommendations are likely to have greater impact and sustainability if linked appropriately with FOR Studies and adequate time is given for CBP preparation to attendees



As observed, both parameters have improved from 8th to 9th CBP.

6.3.2. Summary of parameters evaluated

To identify which parameters have been rated relatively higher, lower and at par across the spectrum of respondents, an initial grouping of 3 has been formed:

4. Group 1, with average rating higher than 3.5
5. Group 2, with average rating between 3 and 3.5
6. Group 3, with average rating lesser than 3

Given groups with the corresponding parameters/questions have been shown below.

Group 1 (>3.5 rating)

Evaluation Criteria	Questions or Parameters	All	CBP-wise
Effectiveness	Were the concerns of all relevant stakeholders adequately addressed in the recommendations provided in the CBP?	√	√
Effectiveness	How would you rate the clarity, structure, and presentation of the CBP presentation/training material?	√	√
Effectiveness	How would you rate the time allocated for discussions/brainstorming by SERCs?	√	√
Effectiveness	How would you rate the incorporation of international case studies and best practices in strengthening the quality of analysis and recommendations in the CBP?	√	√
Impact	Did the CBP contribute in creating awareness and enhancing the knowledge base of SERC members?	√	√
Impact	Did the CBP contribute in providing a global viewpoint of the issues addressed?	√	√
Impact	Did the CBP contribute in providing a national viewpoint of the issues	√	√

Evaluation Criteria	Questions or Parameters	All	CBP-wise
	addressed?		
Sustainability	Can the recommendations of the CBP withstand practical challenges in the future?	√	√
Relevance	Were the topics of the CBP relevant to the functions of the SERC?	√	√
Relevance	Were the topics of the CBP relevant to the crucial issues/challenges being faced by the SERC?	√	√
Efficiency	How would you rate the quality of coordination and logistical arrangements for organization of the CBP?	√	√
Efficiency	Was the time allocated to the CBP optimally scheduled and structured?	√	√
Efficiency	Was the right type of audience sought for the CBP?	√	√
Efficiency	How would you rate the suitability of speakers for the selected topics at the CBP?	√	√
Efficiency	How would you rate the quality of training material provided at the CBP?	√	
Efficiency	How would you rate the performance of the knowledge partner in organizing the CBP?	√	√

Group 2 (>3, <3.5 rating)

Evaluation Criteria	Questions or Parameters	All	CBP-wise
Efficiency	Were you adequately informed of the topics to be discussed at the CBP? (and material provided in advance as applicable)	√	√
Effectiveness	How would you rate the coverage of relevant content in the CBP?	√	
Effectiveness	Were the CBP recommendations feasible for implementation?	√	√
Effectiveness	Were the CBP recommendations suitable to state-specific challenges?	√	√
Effectiveness	Were the CBP recommendations cost-effective?	√	√
Effectiveness	Did the CBP recommendations incorporate state-of-the-art technologies or innovations?	√	√
Effectiveness	How would rate the incorporation of national and state-specific case studies in highlighting prevalent issues in the CBP?	√	
Impact	Did the CBP contribute to formulation of subsequent regulations/orders/ guidelines/concept papers?	√	√
Sustainability	Would the SERCs require further support or intervention from FOR for implementation of the CBP recommendations?	√	

Group 3 (<3 rating)

Evaluation Criteria	Questions or Parameters	All	CBP-Wise
Relevance	What was the level of involvement of the SERC in selecting the topics of the CBP?	√	√
Relevance	Were the SERCs resources/constraints considered before setting of topics of the CBP?	√	√
Relevance	Were the implementation challenges of the state considered before setting of topics of the CBP?	√	√
Effectiveness	What was the level of involvement of the SERC in providing inputs for preparation of the CBP presentation/training material?	√	√
Impact	Did the CBP contribute to actual resolution of prevalent issues in the state?	√	

Following observations have been summarized criteria-wise for the given groupings of parameters:

6. **Relevance:** While the relevance of topics and their relation to current issues has been rated higher than average (Group 1), the involvement and consideration of SERCs in the planning stages of Studies has been rated much lower than average (Group 3).
7. **Efficiency:** Most parameters have been rated high (Group 1), indicating the satisfaction of SERCs with the efficiency in conduct of CBPs undertaken by FOR, with the only concern as sharing of prior information about CBPs (Group 2).
8. **Effectiveness:** Most parameters have been rated average or below average (Group 1 and 2), indicating scope of improvement for quality of CBP delivery and material. Similar to Relevance Criteria, the involvement of SERCs in providing inputs for CBPs continues to be a concern and has been rated lower than average (Group 3).
9. **Impact:** While Impact parameters for creating awareness, and providing national perspective have been rated higher than average (Group 1), other Impact parameters for contribution to regulations and contribution to resolution of actual issues have been rated below average (Group 2 & 3 respectively).
10. **Sustainability:** SERCs have rated the ability of CBPs to withstand future challenges as average (Group 1), while indicating that moderate support will be required for certain types of CBPs from FOR (Group 2).

The number of parameters falling into each of the given groupings has been summarized below.

Criteria/ Average Rating	Planning Stage		Execution Stage	Application Stage	
	Relevance	Efficiency	Effectiveness	Impact	Sustainability
Group 1 (>3.5)	2	6	4	3	1
Group 2 (b/w 3 & 3.5)		1	6	1	1
Group 3 (<3)	3		1	1	
Total No. of Qs.	5	7	11	5	2

As observed, execution stage parameters primarily rated in Group 1 and 2 and perceived to be satisfactory, while there is greater variation in planning and application stages, with key concerns of involvement of SERCs

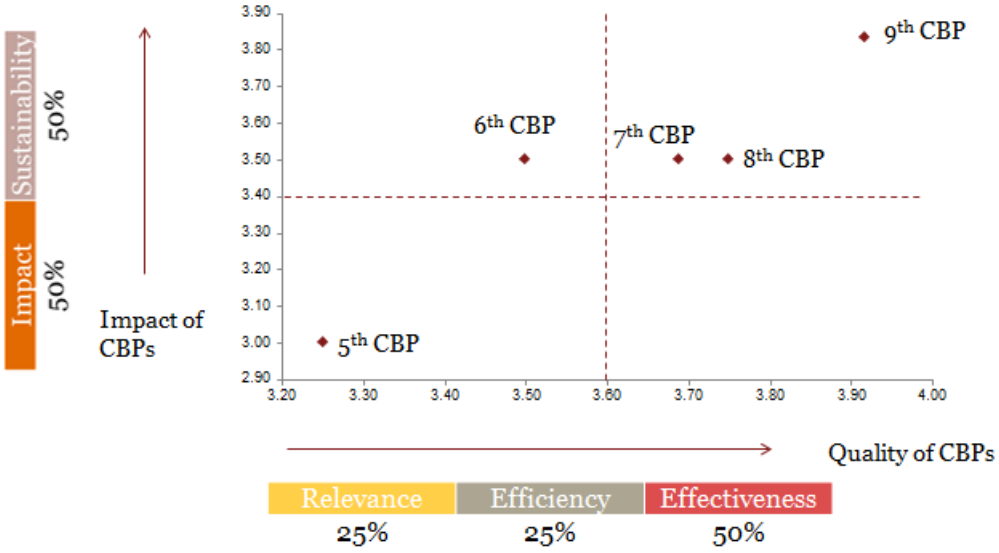
across the lifecycle of a CBP and impact of CBPs on regulations and issue resolution rated lower and falling into Group 3.

6.3.3. Mapping of Quality of CBPs V Impact of CBPs

A major objective of this assignment is enabling greater impact of CBPs to be conducted by FOR in the future, and allowing SERCs to implement CBP learnings in the process of carrying out regular functions as well as undertaking new initiatives.

Thus, it is also crucial to understand where each CBP stands on not only the aspect of quality and delivery of CBP, but also how useful and impactful they have proved to be in aiding SERC functions. Accordingly, FOR can determine measures to improve on both aspects. A mapping has thus been undertaken on the basis of these 2 key dimensions: how well the CBPs were planned and conducted (Quality of CBPs), and how impactful the CBPs were (Impact of CBPs).

To determine Quality of CBPs, the Evaluation Criteria of Relevance, Efficiency and Effectiveness were combined in a 1:1:2 ratio, and to determine the Impact of CBPs, the Criteria of Impact and Sustainability were combined in a 1:1 ratio.



This mapping allows us to visualize the standing of each CBP individually as well as relative to each other on the Quality V Impact map. As observed, the quality of CBPs have improved over time, though the applicability of CBPs has been perceived to improve significantly in the 9th CBP.

In the following section, various statistical analysis conducted on the responses to identify the most crucial and influential parameters has been outlined.

6.4. Statistical Analysis

To identify the most critical and influential variables out of the wide spectrum of survey parameters, each evaluation criteria and its underlying parameters were subjected to various statistical analysis. The tool of SPSS was used to execute the required statistical analysis. Complete results of the analysis have also been attached as Annexure 2.2 to this report.

The results of such analysis have been outlined in the following section.

6.4.1. Determining the most significant parameters

Regression analysis was undertaken to identify the most significant parameters under each Evaluation Criteria which contributed to the overall rating for that Criteria. This enables us to shortlist parameters that respondents perceive most critical for the success of each Evaluation Criteria, as provided in the following section.

6.4.1.1. Relevance of CBPs

For Relevance Criteria, regression analysis was undertaken considering all the Relevance parameters as Independent Variables, and the parameter for assessing the Overall Relevance of Studies as the Dependent Variable. Results of the same have been summarized below:

Parameters	Beta	Sig.
Relevance of Topics	0.794	0.014
SERCs Involvement	0.714	0.005
Relevance of SERC Issues	0.247	0.404
Consideration of SERC Resources	-0.775	0.002
Consideration of SERCs Challenges	0.009	0.953

As can be seen, Relevance of CBP topics and Involvement of SERCs in planning for CBPs express the strongest relationship with the parameter of Overall Relevance. Thus, these two parameters predict and influence the overall perception of Relevance of CBPs the most in the respondents' outlook.

6.4.1.2. Efficiency of CBPs

For Efficiency Criteria, regression analysis was undertaken considering all the Efficiency parameters as Independent Variables, and the parameter for assessing the Overall Efficiency of Studies as the Dependent Variable. Results of the same have been summarized below:

Parameters	Beta	Sig.
Quality of CBP arrangement	0.325	0.238
Structuring and Scheduling	-0.153	0.485
Suitability of attendees	0.213	0.425
Suitability of speakers	-0.018	0.958
Adequate prior information	-0.050	0.707
Quality of training material	0.215	0.459
Partner Performance	0.469	0.091

As observed, the parameters relating to quality of CBP arrangement and execution partner's performance have been considered most significant in making CBPs efficient.

6.4.1.3. Effectiveness of CBPs

For Effectiveness Criteria, regression analysis was undertaken considering all the Effectiveness parameters as Independent Variables, and the parameter for assessing the Overall Effectiveness of Studies as the Dependent Variable. Results of the same have been summarized below:

Parameters	Beta	Sig.
SERCs Involvement	0.078	0.106
Stakeholder Concerns	-0.118	0.186
Content Coverage	-	-
Feasibility of Recommendations	2.687	0.002
State Suitability of Recommendations	-0.517	0.062
Cost effectiveness	0.085	0.325
Technology Incorporation	-0.090	0.425
Quality of Presentations	1.443	0.002
Time for Discussions	-1.498	0.005
Including International Cases	-	-
Including National Cases	-1.094	0.003

Quality of presentations and feasibility of recommendations proposed in the CBPs hold most significance for SERCs in making CBPs effective.

6.4.1.4. Impact of CBPs

For Impact Criteria, regression analysis was undertaken considering all the Impact parameters as Independent Variables, and the parameter for assessing the Overall Impact of Studies as the Dependent Variable. Results of the same have been summarized below:

Parameters	Beta	Sig.
Increase in Awareness	0.539	0.007
Enhancing Global View	0.002	0.993
Enhancing National View	0.078	0.802
Contribution to Regulations	0.139	0.440
Contribution to Issue Resolution	0.245	0.183

As observed, the parameters relating to contribution of CBPs to awareness of issues and issue resolution have been considered as the most crucial parameters for SERCs in perceiving CBPs as impactful.

6.4.1.5. Sustainability of CBPs

For Sustainability Criteria, regression analysis was undertaken considering all the Sustainability parameters as Independent Variables, and the parameter for assessing the Overall Sustainability of Studies as the Dependent Variable. Results of the same have been summarized below:

Parameters	Beta	Sig.
Requirement of FOR Interventions	-0.050	0.514
Withstanding future challenges	1.045	0.000

As observed, the ability of CBP learnings to withstand future challenges has been considered as the strongest expression of sustainability.

6.4.1.6. Most significant parameters for each evaluation criteria

The list of most significant parameters as deduced from regression analysis of each evaluation criteria have been outlined below.

Since the number of responses for CBPs were low (15), the results of statistical analysis undertaken on the responses are likely to be influenced by the responses of only a few respondents. Hence, the results from this small base of responses have not been used exclusively for deriving insights, but have been supplemented with insights from ratings analysis as well as qualitative responses.

Evaluation Criteria	Parameter	Beta Value	Significance Value	Corresponding question asked in Survey
Relevance	Relevance of CBP topics	0.794	0.014	Were the topics of the CBP relevant to the functions of the SERC?
	SERCs Involvement	0.714	0.005	What was the level of involvement of the SERC in selecting the topics of the CBP?
Efficiency	Quality of CBP arrangements	0.325	0.238	How would you rate the quality of coordination and logistical arrangements for organization of the CBP?
	Partner Performance	0.469	0.091	How would you rate the performance of the knowledge partner in organizing the CBP?
Effectiveness	Quality of Presentations	1.443	0.002	How would you rate the clarity, structure, and presentation of the CBP presentation/training material?
	Feasibility of Recommendations	2.687	0.002	Were the CBP recommendations feasible for implementation?
Impact	Increase in Awareness	0.539	0.007	Did the CBP contribute in creating awareness and enhancing the knowledge base of SERC members?
	Contribution to Issue Resolution	0.245	0.183	Did the CBP contribute to actual resolution of prevalent issues in the state?
Sustainability	Withstanding future challenges	1.045	0.000	Can the recommendations of the CBP withstand practical challenges in the future?

The given parameters influence the rating of each Evaluation Criteria the most, and therefore hold most significance for the SERCs. Therefore, each of these parameters needs to be scrutinized for satisfactory conduct of each CBP.

6.4.2. Discovering new groups of parameters

A lifecycle approach was formulated for impact assessment of FOR CBPs to ensure coverage of all key parameters under 5 heads: Relevance, Efficiency, Effectiveness, Impact and Sustainability. However, it is also crucial to discover the overarching basis/factors *as perceived by Respondents* which encompass the larger set of initial parameters.

Factor Analysis (Principal Components) was thus undertaken to identify new groups of parameters as per the proximity/similarity of response trends. Grouping of parameters as determined through Factor Analysis (Principal Components) has been shown below. Each evaluation criteria has been assigned a colour for better visualization of distribution of parameters.

Relevance
Efficiency
Effectiveness
Impact
Sustainability

Table 33: Grouping of parameters - All responses

Group 1	Group 2	Group 3
Conduct and delivery of CBPs	Involvement of SERCs	Applicability of CBPs
Efficiency: Quality of CBP arrangement	Relevance: Relevance of Topics	Effectiveness: Stakeholder Concerns
Efficiency: Suitability of attendees	Relevance: SERCs Involvement	Effectiveness: State Suitability of Recommendations
Efficiency: Suitability of speakers	Relevance: Relevance of SERC Issues	Effectiveness: Cost Effectiveness
Efficiency: Quality of training material	Relevance: Consideration of SERC Resources	Impact: Contribution to Regulations
Efficiency: Partner Performance	Efficiency: Structuring and Scheduling	
Effectiveness: SERCs Involvement	Impact: Enhancing Global View	
Effectiveness: Content Coverage	Impact: Enhancing National View	
Effectiveness: Feasibility of Recommendations	Impact: Contribution to Issue Resolution	
Effectiveness: Quality of Presentations		
Effectiveness: Time for Discussions		
Effectiveness: Including International Cases		
Impact: Increase in Awareness		
Sustainability: Withstanding future challenges		

As can be observed, all parameters fall into 3 major groups which can be named as: Conduct and delivery of CBPs, Involvement of SERCs, and Applicability of CBPs. Thus, these overarching parameters hold primary importance for SERCs, within which various parameters can be delineated.

6.5. Qualitative Responses

Qualitative responses were received from the feedback forms filled at the end of each CBP by participants. Recurring feedback has been grouped under two major heads: Feedback regarding conduct of CBP sessions, and feedback regarding Programme content. Specific feedback for each CBP has also been outlined subsequently.

6.5.1. General feedback from SERCs

The following feedback has been provided by personnel from various SERCs for various CBPs conducted by FOR in the past 5 years:

Conduct of CBP sessions

- For internationally held CBPs, field visits along with the CBP may be conducted, and may involve the host country's regulator
- Number of days can be increased for a more immersive programme and enhanced expertise building
- More interactions for pressing issues are required; and dedicated sessions may be organized by FOR for brainstorming and discussions on the same
- Selective participation of other relevant stakeholders (CERC, FOR, MoP etc.) as relevant to topics under discussion may be useful for greater impact of CBPs

Quality of programme content

- Pre-CBP material can be sent in advance for better preparation of participants and ready reference in the future
- International perspective can improve across topics and included in the form of international case studies/ regulatory models/ success stories, etc.
- Programme material can be better suited to participants, including a strategic as well as an operational point of view
- Training on fundamental issues may also be included for new domains, since many SERC personnel are new to their respective roles

6.5.2. Specific feedback for each CBP

Specific feedback was also captured for each CBP and provided in the table below.

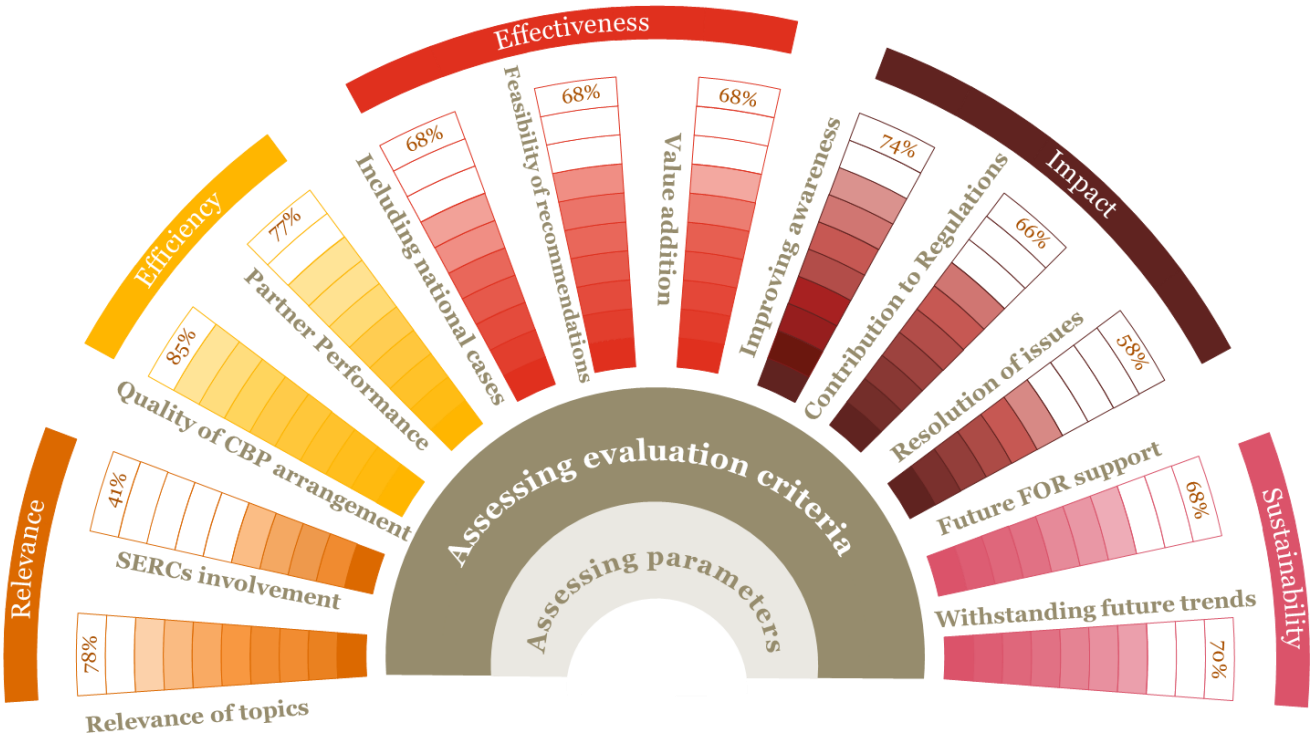
CBP	Feedback
6th CBP	Further discussions are required on balancing tariff recovery with Discom performance
7th CBP	Legal and regulatory issues can be given more focus and presented in the form of case studies
8th CBP	More focus can be given on South Asian regulatory models, since many countries in the South East Asian region have followed a similar trajectory in the past
9th CBP	Involvement of host country's regulator or experts in CBP will be useful in complementing the learnings of the CBPs

The given qualitative feedback has been assessed in conjunction with quantitative feedback and formalized into insights as provided in the following section.

6.6. Summary of analysis results

The assessment of responses produced multiple insights and learnings from various types of Ratings and Statistical analysis. While Ratings analysis allowed a close look at each parameter and Evaluation Criteria individually, Statistical analysis allowed a broad look at the relationship between low and high level parameters. The results of the two types of analysis have been combined and depicted in the following diagram, wherein the average ratings of the most significant/critical parameters as perceived by respondents are shown.

Figure 21: Average Ratings of Parameters - CBPs



Parameters rated below 70% indicate scope of improvement, while parameters rated over 70% indicate existing areas of strength that can be further improved.

6.6.1. Assessment of survey parameters across CBP lifecycle

Ratings analysis was undertaken to comprehensively assess the ratings of all parameters across the lifecycle of CBPs. The insights derived from previous analysis have thus been summarized in accordance with 3 broad stages of a lifecycle – Planning, Execution and Application Stage.

Figure 22: Summary of Ratings Analysis - FOR CBPs

Planning Stage	Execution Stage	Application Stage
• Early coordination with SERCs for CBP planning • Sharing of prior information and material	• In-depth coverage & discussions on pertinent issues • Enhancing national and international perspective • Comparison with similar/comparable regulatory models • Tailoring content to profile of participants	• Determining optimal number of days and corresponding schedule as per CBP agenda • Incorporating more field visits • Scheduling brainstorming sessions • Presentations on FOR Studies

Planning Stage: *Enhancing involvement of SERCs*

- Ensuring greater involvement of SERCs in determination of topics for CBP sessions, discussions and related agenda items
- Ensuring that information and material relevant to CBP is sent to participants in advance

Execution Stage: *Enhancing quality of Programme content*

- Ensuring in-depth coverage and discussions on pertinent issues, particularly for new domains relevant to Renewable and Other Sector Studies
- Enhancing national and international perspective for all relevant domains
- Comparison with more relevant regulatory models in other countries
- Tailoring content to profile of participants

Application Stage: *Enhancing capacity building of participants*

- Number of days to be determined in accordance with coverage of topics, requirement of field visits and interactions and location
- Incorporating field visits as relevant to the agenda of the CBP
- Scheduling brainstorming sessions to ensure knowledge transfer between leading and lagging states
- Presentations on Studies conducted by FOR by the respective Consultants/Partners

6.6.2. Assessing criticality of parameters as perceived by SERCs

Statistical analysis was undertaken to identify the most critical and influential variables out of the wide spectrum of survey parameters used. The insights derived from this exercise have thus been summarized below:

Figure 23: Summary of Statistics Analysis - FOR CBPs

Most significant parameters	Overarching criteria for successful studies
•Relevance of study topics and their relation to current issues •Quality of CBP arrangements and facilities •Quality of presentations and feasibility of recommendations •Increase in awareness levels and impact on issue resolution •Sustainability of recommendations	•Involvement and consideration of SERCs inputs at each stage •Conduct of and delivery of CBP •Applicability and suitability of CBP learnings

Most significant parameters: *Parameters that hold utmost importance for SERCs*

- Relevance of topics covered in CBPs and involvement of SERCs in determination of the same
- Quality of CBP arrangement and corresponding performance of executing partner
- Quality of presentations and feasibility of recommendations for states
- Increase in awareness of pertinent issues and their contribution to issue resolution
- Ability of CBP learnings and recommendations to withstand future trends

Overarching criteria for successful studies: *Broad parameters that encompass all others*

- The primary criteria is Conduct of and delivery of CBP, including programme content
- Involvement of SERCs considered a major concern and grouped separately
- Applicability and suitability of CBP learnings for state-level implementation considered a different group

7. Way Forward

Several insights have been derived from the responses provided by SERCs, which point to both strengths and weaknesses in the conduct of Studies and CBPs. Such insights allow the identification and framing of areas that require more focus in the future.

A framework has thus been designed to ensure the redressal of gaps identified across the lifecycle of Studies and CBPs, as well as improve impact and sustainability of Studies as required by SERCs over time.

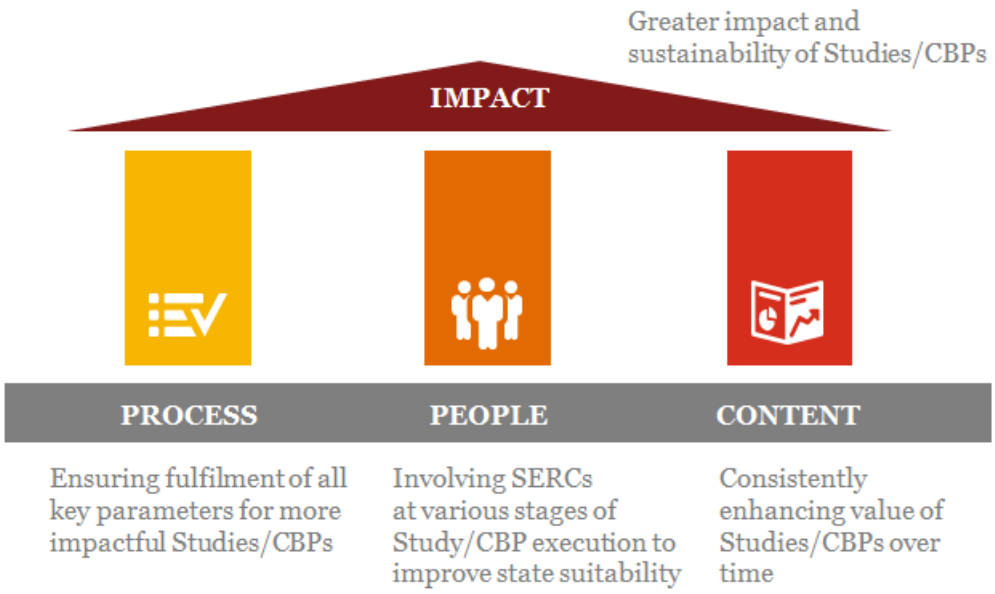
7.1. Framework for future Studies & CBPs

On the basis of derived insights, three major focus areas have been identified:

1. Making the process of carrying out Studies and CBPs uniform, robust and inclusive of all critical requirements - **Focus on Process**
2. Ensuring the involvement of suitable personnel from SERCs from planning to application stages of a Study or CBP – **Focus on People**
3. Developing in-depth, all-rounded and referable content for Studies and CBPs that can readily be adopted by SERCs – **Focus on Content**

Accordingly, a framework has been outlined which focusses on the pillars of Process, People and Content, as depicted below:

Figure 24: Pillars for improving impact of Studies and CBPs



Process Enhancement

- Ensuring fulfilment of all critical parameters that are responsible for making Studies and CBPs more impactful and sustainable
- Focusing on process enhancement will ensure that Studies and CBPs become increasingly uniform and comparable over time, incorporate all vital requirements and allow immediate assessment for impact

Stakeholder Involvement

- Involving SERCs at across the lifecycle of Studies and CBPs to ensure state suitability of recommendations
- Focusing on stakeholder involvement will ensure that the process of conducting Studies and CBPs becomes more accountable for implementation by states

Value Enhancement

- Continually enhancing value of the content for Studies and CBPs with value addition in aspects of technology, global domains, other sectors, roadmap for implementation, etc.
- Focusing on value enhancement will ensure that content of Studies and CBPs becomes go-to-material for SERCs in the process of undertaking its functions

Continuous improvement on the given pillars of Process, People and Content will enable the fulfillment of all parameters deemed critical for making Studies and CBPs impactful.

On the basis of identified focus areas for each of the pillars, the following recommendations have been devised and mapped across the stages of Planning, Execution and Application.

Table 34: Summary of Recommendations

Pillars	Planning Stage	Execution Stage	Application Stage
Process	• Forming of working groups comprising of select SERC personnel to ensure greater coordination • Establishing a communication template and mechanism to ensure constant information exchange	• Formalize a framework to shortlist appropriate states/other countries for case studies to ensure representation and suitability • Formalize a framework/checklist to cover critical parameters for in-depth, all-rounded content	• Reinforcing Study findings and recommendations through focused discussions in CBPs and other forums • Formulate a roadmap to tackle complex issues in successive steps over a period of 5 years through Studies and CBPs
People	• Floating interest survey to SERCs for deciding topics of Studies and CBPs • Utilizing survey and working group feedback for designing content for SERC personnel and prospective CBP participants	• Developing an online discussion forum as a more informal forum for discussions on best practices, along with invited experts/stakeholders • Ensuring periodic communication between stakeholders for informing progress and receiving inputs/feedback	• Survey for capturing feedback immediately after completion of Studies & CBPs • Produce state-wise challenges for implementation as an outcome of each Study and CBP
Content	• Using parameter checklist to outline outcomes during planning with added focus on international benchmarking, state representation, enablers for implementation and resolution of challenges.	• Interim review of content from relevant stakeholders, with an early focus on state-specific challenges and adoption of possible solutions.	• Outlining enablers for recommendations and tailor recommendations for lagging and leading states • Discussion on long-term relevance of Studies a must for finalization of Studies
• *Interest Survey to gather most relevant topics for future Studies and CBPs from SERCs* • *Checklist of critical parameters to ensure coverage of all aspects across lifecycle of Study/CBP* • *Online forum for regular discussions on pertinent issues* • *Communication template for receiving data, inputs and other feedback*			

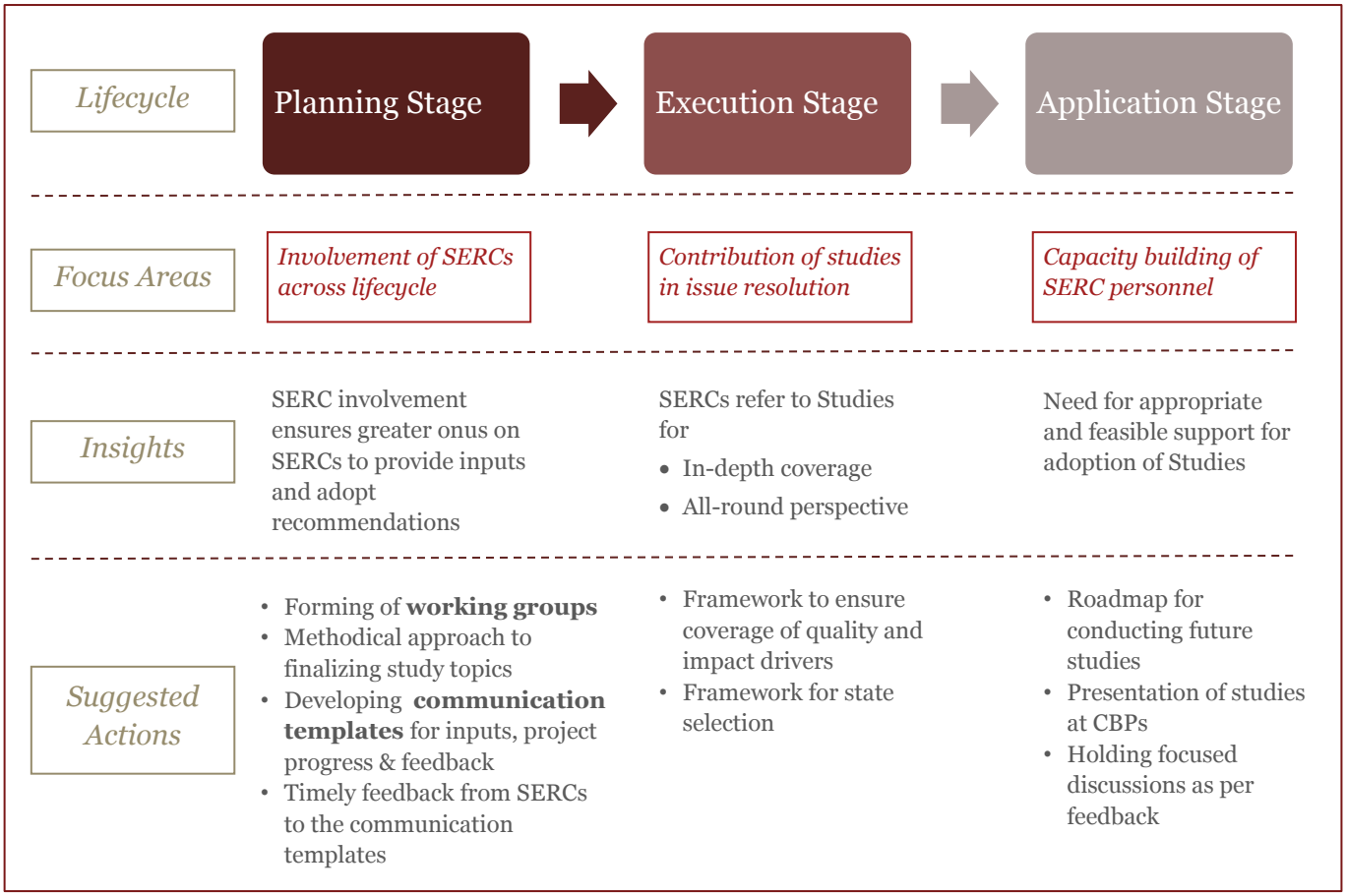
Each of the given pillars has been delineated in the following section.

7.1.1. Process Enhancement

To redress the gaps found in the conduct of Studies and CBPs, it will be crucial to conduct Studies and CBPs in a manner that leads to the greatest impact on SERC functions and state outcomes. Accordingly, the most impactful parameters across the lifecycle of Studies and CBPs may to be implemented with a new approach, as outlined in the following section for both Studies and CBPs.

7.1.1.1. Studies

As depicted in the diagram below, several initiatives and actions can be undertaken across the 3 stages of planning, execution and application to ensure redressal of key concerns.



Planning Stage: *Ensuring greater onus on FOR and SERCs for providing state-level inputs*

- It will be essential for SERCs to form working groups in coordination with FOR for planned Studies and CBPs to establish a channel of regular communication and feedback. Such a group should comprise of SERC personnel such that suitable designations, regions and expertise is well represented in the working group.
- It will also be useful to ensure the determination of Study topics annually on the basis of a methodical exercise:
  - Floating of a survey to all SERCs at the beginning of each year outlining all possible topics that may be chosen for coverage in Studies and CBP agendas
  - On the basis of parameters such as most popular topics, urgency of reform, feasibility, time and resource constraints, and other related parameters, the topics may be finalized by FOR
- Communication templates may be developed for periodic and timely gathering of inputs and feedback from target SERCs

Execution Stage: *Ensuring the development of quality content for Studies and CBPs*

A framework/checklist can be developed to ensure that all required parameters are being satisfactorily achieved for each Study and CBP across the corresponding lifecycle. A sample checklist has been depicted below for Studies. Here, relevant parameters have been highlighted as applicable for each stage of the Study lifecycle.

Table 35: Framework/Checklist for Critical Parameters

Parameters	Planning Stage: Finalizing Scope of Work & Proposal	Execution Stage: Interim review of Study findings	Application Stage: Finalizing Study Report
Relevance of topic to SERC functions and priority areas	√		
Relevance of topic to prevailing issues and required state outcomes	√		
Mechanism for coordination between stakeholders	√	√	√
Time for completion of Study	√	√	√
Quality of research methodologies followed		√	√
Quality of analysis undertaken		√	√
Inclusion of suitable National Case Studies		√	√
Inclusion of suitable International Case Studies		√	√
Feasibility of given recommendations/way forward		√	√
Increase in Awareness of relevant stakeholders			√
Mechanism or roadmap for use in formulation of regulations/ policies/ concept papers, etc.			√
Ability to withstanding relevant future challenges			√

Application Stage: *Providing for suitable and feasible support for implementation of Studies/CBPs*

- A roadmap for each broad domain (such as Commercial & Tariff, Technical, Consumer Interests, Renewable, DSM and Efficiency, Competition, etc.) may be formulated, outlining future studies planned for each domain. Annual surveys floated each year to SERCs for selecting topics can allow revisions as required. This will allow SERCs to plan in advance for participation in such Studies, as well as plan for requisite resources for coordination. This will also ensure adequate representation from each state over time.
- With a clear roadmap for future studies, topics for future CBPs may also be determined and distributed across future CBPs to ensure balanced and comprehensive agendas for CBPs.
- Previously conducted Studies and topics that require further support for implementation may be discussed by SERCs in specially organized discussions during CBPs.

7.1.1.2. CBPs

As depicted in the diagram below, several initiatives and actions can be undertaken across the 3 stages of planning, execution and application to ensure redressal of key concerns.

Lifecycle	Planning Stage	Execution Stage	Application Stage
Focus Areas	*Involvement of SERCs across lifecycle*	*Contribution of studies in issue resolution*	*Capacity building of SERC personnel*
Insights	Linkage between CBPs, FOR studies and pre and post CBP activities could be improved	• Learning from CBPs • In-depth coverage • All-round perspective • Experiences of other states and discussion on new ideas	SERC-specific issues (staffing, expertise, state issues) may be addressed as a follow up

Suggested Actions	• Discussions with working group on
	  ○ Deciding topics for CBPs
	  ○ Profile of speakers
	• Communication template for background, agenda, relevant material
		• Additional interactive sessions and focused discussions
		• Option of field visits to be floated early
		• Framework to ensure coverage of quality and impact drivers
			• Interaction of lagging SERCs with FOR and relevant consultants on carrying forward CBP takeaways
			• Capturing challenges faced and addressing them in subsequent Studies & CBPs

Planning Stage: *Improving linkage between FOR Studies and CBPs*

- Capacity Building Programmes can be planned in a methodical manner, consisting of the following three components:
  - **Ensuring Coverage of topics:** Gauging interest of SERCs on a variety of pertinent topics and compiling a list of such topics that may be covered in the upcoming CBPs. It will also be crucial to link Studies and CBPs during the planning stages itself, allowing continuity in development of recommendations, incorporation of state feedback and adoption of recommendations
  - **Training and Capacity Building Requirements:** In addition to topics for Studies and CBPs, other requirements for training/knowledge enhancement of SERC personnel can also be gathered. This will help tailor content to possible profiles of attendees for CBPs can also be pre-determined and communicated
  - **Constant communication:** Similar to Studies, a Communication Template may be developed for periodic and timely gathering of inputs and feedback from target SERCs

Figure 25: Planning of Capacity Building Programmes

Execution Stage: *Ensuring that CBPs enhance knowledge and expertise of participants*

- Intermittent interactive sessions can ensure transfer of ideas and knowledge between SERCs on each topic
- Relevant field visits may be planned to complement learnings from CBP sessions
- Similar to Studies, a framework/checklist may be developed to ensure satisfactory achievement of all critical parameters

Application Stage: *Addressing specific implementation issues of select SERCs*

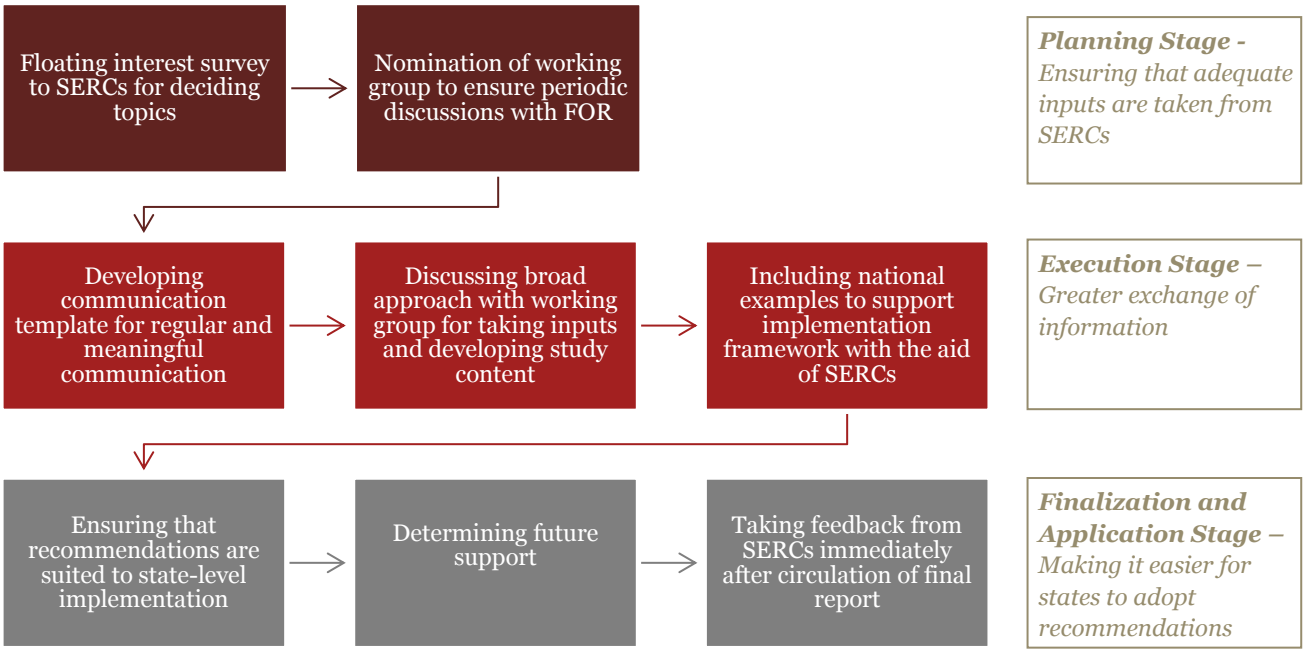
- Capturing all challenges faced by SERCs in implementation of recommendations for further addressal in future Studies and CBPs
- Organizing interactive sessions between leading and lagging states for knowledge transfer and exchange of best practices

7.1.2. Stakeholder Involvement

Continual involvement of SERC personnel has been found crucial for state-level suitability and successful uptake of Study and CBP learnings. Therefore, a detailed plan for periodic coordination with SERCs has been framed to ensure that state-level inputs are duly incorporated at every stage.

7.1.2.1. Improving stakeholder involvement in Studies

The following steps can be undertaken at each stage of conducting a Study for greater state suitability of study findings and recommendations.

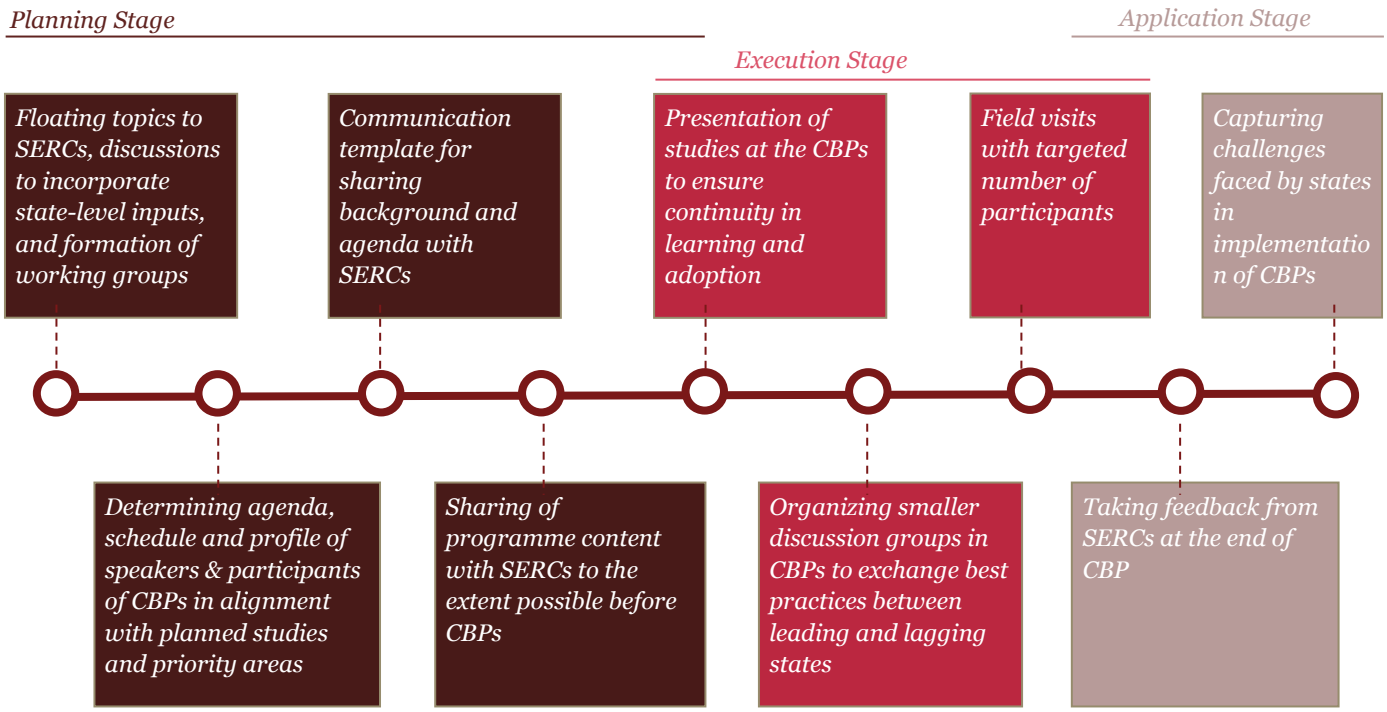


Planned synchronization with a well-represented working group will thus allow each stakeholder to be regularly updated on the progress of FOR initiatives and to contribute as required.

- Floating of a survey comprising of a pertinent list of issues to all SERCs will aid both FOR and SERCs in planning in advance for conducting Studies
- As discussed before, nomination of a working group comprising of personnel from various SERCs will allow continual communication on Study progress and requirements
- Periodic inputs will allow the Study to be tailored iteratively towards more feasible and viable recommendations that SERCs will be willing to adopt
- Receiving immediate feedback after circulation of Study reports will allow course correction on any gaps found in the conduct of the Study

7.1.2.2. Improving stakeholder involvement in Studies

Similar to the required actions for Studies, the following steps can be undertaken at each stage of conducting a CBP for greater state suitability of CBP learnings.



- A methodical approach for involvement of SERCs can be followed for floating topics to SERCs, discussions to incorporate state-level inputs, and formation of working groups
- In the planning stages for both Studies and CBPs, it will be useful to determine the agenda, schedule and profile of speakers & participants of CBPs in alignment with planned studies and priority areas
- Sharing of programme content with participants will aid them in preparation for the CBPs and refer back to the material in the future
- Focused discussions for most pressing issues can be held intermittently during the course of the CBP
- The most prevalent challenges voiced by participants can be captured and formalized for further action in future Studies and CBPs

7.1.3. Value Enhancement

SERCs have strongly indicated the requirement of comprehensive Studies and CBP training material for increasing awareness of pertinent issues, and understanding relevant cases in the national and international context. Additionally, SERCs also seek information on other relevant aspects (technology, cost effectiveness, etc.) that can build further perspective on the given issues. Thus, it will be crucial to continue improving on not only essential parameters but also those that build additional perspective.

7.1.3.1. Enhancing value of Studies

To continue improving on significant parameters as derived in the analysis of this study, the following actions may be undertaken:

Relevance to state-level issues	Development of Study Content	Applicability of Studies
• Ensuring that most pressing issues are covered in upcoming studies • Lagging states to be targeted better in the studies	• Ensuring delivery on each relevant parameter • Steps for better adoption and support required should be delineated in a separate section	• Ensuring that immediate feedback post circulation of studies is acted upon

In order to add more value to studies and build additional perspectives, the following actions may be undertaken:

Global Outlook	Incorporation of technology	Long-term relevance
• Relevant international case examples to complement recommendations • Mapping international cases into a 'Step-Jump-Leap' scale of feasibility • Learning from other sectors in global context	• Ensuring that relevant and supporting technologies are incorporated • Key stakeholders in technology interventions to be taken into consideration	• Ensuring sustainability of study recommendations: ○ Alignment with larger vision for the sector ○ Flexibility for varying regulatory changes/state conditions over 3-5 years

The given suggestions may be adapted as per the current status of given reform in various states, expected trends in the future, availability of time and resources, and desirable outcomes in the short and long run.

7.1.3.2. Enhancing value of CBPs

Similar to Studies, in order to improve the most significant parameters for impactful CBPs as recognized in this study, the following actions may be explored:

Relevance to state-level issues	Conduct & Delivery of CBPs	Applicability of CBPs
• CBP topics in alignment with planning for studies and other key issues • Planning focussed discussions on issues as demanded	• Ensuring suitability of material to profile of attendees	• Challenges that SERCs are likely to face in implementation should be outlined in discussions

Similar to Studies, in order to add more value to CBPs and build additional perspectives, the following actions may be undertaken:

Global Outlook	Information requirements	Coordination with stakeholders
• Citing global examples at operational level to suit participant profile • Outlining challenges of applying global/progressive models in India • Outlining steps undertaken by countries in developing relevant regulations	• Establishing relevant repository of information for SERC Directors & Below Focussed discussions on information and technology requirements • Experts on technology and information systems may be invited for discussions	• What kind of data and inputs are required from other stakeholders in the state • How to coordinate better with stakeholders in the state for the formulation of regulations/orders/ concept papers etc.

Forum of Regulators may thus utilize the given approach for identifying gaps and undertaking necessary actions for each Study and CBP; suggested efforts to iteratively improve on all key parameters will increasingly make Studies and CBPs more impactful and enhance communication between all stakeholders in the future.

8. Conclusion

Forum of Regulators has successfully conducted 20 Studies and 5 Capacity Building Programmes in the past 5 years, covering a range of relevant issues - tariff reforms, reduction in technical and commercial losses, functioning of CGRF and Ombudsman, competition in retail supply, promotion of renewable energy, energy efficiency and demand management, open access, smart grids, and other prevailing issues in the power sector. Thus, FOR has ensured the coverage of key aspects across commercial, technical, consumer and other emerging areas domains in conducted Studies and CBPs.

The exercise of assessing impact of such Studies and CBPs has revealed that while SERCs have valued the quality of study reports, CBP presentations and related content, they seek a parallel mechanism wherein they are duly involved and motivated to contribute in a meaningful manner. Such a mechanism will also make it easier for states to embrace and adopt Study and CBP outcomes, initiating a healthy cycle of feedback-driven Studies and CBPs.

The following ***areas of improvement*** have been brought forth by this assignment:

- Greater inclusion and involvement of SERCs across lifecycle of Studies and CBPs
- Allowing more interaction between SERCs for communication of best practices
- Ensuring coverage of parameters as perceived significant by SERCs by all Studies and CBPs
- Greater focus on adoption of recommendations by SERCs for the purpose of fulfilling their functions and resolution of pertinent issues

The following ***areas of strength*** have been discovered in this assignment which can be further capitalized upon:

- Enhancement of knowledge and awareness regarding complex issues with the help of Studies and CBPs
- Incorporation of national case studies and best practices employed in various states
- Sustainability of recommendations and ability to withstand future trends

Further discussion and deliberation on the findings of this study with all members of FOR as well as all SERC personnel will allow continuous improvement of Studies and CBPs on critical parameters. It will be useful for FOR to employ certain ***tools and techniques*** to aid this process of improvement:

- Appointment of a working group for specific Studies/CBPs for greater coordination and ensuring accountability from all stakeholders
- Template for interest survey to gauge key topics to be covered in Studies and CBPs
- Checklist of critical parameters necessary for impactful Studies and CBPs to be fulfilled at every stage of Study and CBP lifecycle
- Online forum for regular discussions on pertinent issues
- Communication template for coordination between FOR Secretariat and SERCs: receiving data and inputs, scheduling formal review sessions or informal interactive sessions, receiving qualitative feedback, summarizing findings of Studies and CBPs and other critical communication

For the purpose of assessing the impact of FOR Studies and CBPs conducted in the past 5 years, a lifecycle approach based on OECD-DAC principles was followed. Such an approach can also be utilized in the future to ensure assessment of specific initiatives, continual focus on impact and application of Studies and CBPs, greater orientation towards results and outcomes, increase in knowledge of SERC personnel regarding pertinent issues, and comparability of outcomes over time.