Forum of Regulators (FOR)

Final Report

on

Impact Assessment of Plan Assistance to the Forum of Regulators by the Ministry of Power during the 11th Plan Period

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Executive Summary

The Forum of Regulators (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. The Ministry of Power (MoP) provides Plan Assistance to the Secretariat of FOR for undertaking Studies and CBPs. The Secretariat of FOR conducted 18 Studies and 21 Capacity Building Programmes (CBPs) during the 11th Five Year Plan period (FY 2007-08 to FY 2011-12). The Secretariat of FOR has appointed ICRA Management Consulting Services Limited (IMaCS) to carry **"Independent Impact Assessment of the Studies and Capacity Building Programmes".** The objective of the study is to prepare a comprehensive report on impact assessment of the CBPs and Studies undertaken by FOR during the 11th plan.

Highlights of the approach and key findings:

The highlights of the approach adopted and the key findings of the impact assessment study are listed below:

A. The impact assessment is conducted based on a quantitative approach using data collected from a stakeholder survey and is corroborated by a qualitative analysis. The evaluation framework used for the quantitative impact assessment is a customized form of logical framework.

B. Statistical analysis is conducted to
   i. Ensure the reliability, validity and free of bias nature of the data
   ii. Verify the weights assigned to the evaluation sub-parameters

C. The overall impact score is assessed on a scale of 1 to 5 where score of 1 indicates least satisfaction and score of 5 indicates most satisfaction.

D. The overall impact score for the Studies is 3.91 indicating a high level of satisfaction from the respondents.

E. The overall impact score for the CBPs is 4.01 indicating a high level of satisfaction from the respondents.

F. The impact scores were verified by using modified weights derived based on statistical analysis for the evaluation sub-parameters. The difference in the impact scores when compared to the scores computed using original weights was found to be less than 1% in the case of Studies and less than 2% in the case of CBPs.

G. Qualitative inputs received from the ERCs indicated the Studies and CBPs conducted by FOR contributed to improving regulatory certainty in the electricity sector as well as harmonization and coordination amongst the ERCs. A high level of satisfaction is observed from most of the

discussions where respondents also provided examples of the positive impact of Studies and CBPs. Thus the quantitative findings are corroborated by the qualitative inputs.

H. Key findings from the qualitative discussions on the impact of the Studies are listed below:

    i.   The topics of the Study reports were found be critical and important to the ERCs as these addressed the key regulatory issues in the Indian electricity sector.

    ii.   Studies were helpful in drafting regulations, orders and in other activities performed by ERCs.

    iii.   Respondents also appreciated the Studies for providing useful insights and background information. These reports also served as a good reference material.

I. Key findings from the qualitative discussions on the impact of the CBPs are listed below:

    i.   Case studies discussed in the CBPs were directly relevant to the ERCs. For example, insights from an international case study on fuel audit had resulted into policy implementation and thus saving of money for a state.

    ii.   Mix of participants in the CBPs was found to be adequate and versatile.

    iii.   Faculty were rated high in terms of the subject expertise as well as in effectiveness of communication.

J. Key suggestions made by stakeholders to enhance the impact of the Studies are listed below:

    i.   Enhanced focus is suggested on international experiences, recent examples, innovation, real world problems.

    ii.   It was suggested that state specific case studies may be included in the CBPs.

    iii.   It was suggested that ERCs may be consulted for selecting the topics for the Studies. There were suggestions on topics for the future Studies such as

        a)   Reduction in AT&C losses in areas with marginal HT consumers

        b)   Governance issues

        c)   Performance of the regulatory system.

B. Key suggestions made by stakeholders to enhance the impact of the Studies are listed below:

    i.   The CBPs should be conducted at least for 4 to 5 days to facilitate in depth understanding of the subject.

    ii.   New topics such as the following were suggested to be taken for future CBPs:

        a)   Optimal power procurement planning

        b)   Legal aspects of Indian electricity sector

        c)   Financial or Tariff modelling

K. Thus, qualitative analysis indicates that there is a scope to enhance the impact of the Studies and CBPs by deepening the focus on specific aspects as well as taking up a wider range of programmes. Statistical analysis has identified key sub-parameters that are the major contributors to the positive impact of the Studies and CBPs. These are listed separately in the

report. FOR may focus on these aspects while designing future programmes to maximize the impact of the programmes.

L. Based on the impact scores and the qualitative discussions with stakeholders, the overall impact of the Studies and CBPs was assessed as being highly satisfactory and is also found to be in line with the objectives of FOR.

Evaluation framework:

For the purpose of impact assessment, evaluation frameworks had been designed separately for the Studies and CBPs. The evaluation framework consisted of the identified evaluation parameters organized under the categories as shown in the table below. The group of respondents for the survey to assess the impact under each category of parameters is also shown in the table.

Table 1: Classification of categories based on the objectives

Category	Objective	Respondent group
Input	Assesses the adequacy and appropriateness of the resources invested for conducting Studies and CBPs.	Only the Secretariat of FOR would be able to comment on the resources invested and their adequacy. Hence the responses were collected from the officers of the Secretariat of FOR.
Output	Measures the adequacy and effectiveness of the activities undertaken as part of conducting Studies and CBPS.	Two responses were sought from each of the 28 ERCs. One at a Chairperson or Member level and the other at Officer level.
Outcome	Assesses the short, medium and long term achievements of the Studies and CBPs.	Two responses were sought from each of the 28 ERCs. One at a Chairperson or Member level and the other at Officer level.

These categories were further divided into sub-categories as shown in the Figure 1and Figure 2 for Studies and CBPs respectively. The list of parameters under each category and the assigned weights are also presented in these figures. Under each parameter, one or more sub-parameters are identified and questions are formulated corresponding to each sub-parameter. The number of questions are 22 and 20 in Studies and CBPs respectively. The list of questions is presented in the report.

Figure 1: Evaluation Framework for Impact Assessment of Studies

The evaluation framework for Studies consists of sixteen parameters categorized under three main categories and six sub-categories

INPUTS (10%)

Resources (10%)

1- Financial resources (2.5%)
2- Human resources (2.5%)
3 - Partners (5%)

OUTPUT (70%)

Activities (65%)

4-Topic selection (10%)
5-Objective definition (5%)
6-Scope of the study (5%)
7-Report Structure (5%)
8-Content (40%)

Participation (5%)

9-Involvement of the stakeholders (5%)

OUTCOMES (20%)

Short Term[2] (7.5%)

10-Creating Awareness (2.5%)
11-Knowledge enhancement (5%)

Short to Medium[3] Term (5%)

12-Adoption of Best Practice (2.5%)
13-Policy formulation[5] (2.5%)

Long[4] Term (7.5%)

14-Impact on consumer interest (2.5%)
15-Economic impact (2.5%)
16-Environmental impact (2.5%)

Note:

1. Values in parentheses in indicate the weights of the parameter/sub-category/category for computation of the overall impact score.
2. Short term indicates a period less than 6 months from the date of publishing of the Study reports.
3. Medium term indicates a period from 6 months to 3 years from the date of publishing of the Study reports.
4. Long term indicates a period more than 3 years from the date of publishing of the Study reports.
5. Policy formulation covers formulation of regulations/ policies/ orders/ guidelines/ approach papers.
6. Total number of questions formulated under the evaluation framework for Studies is 22 which are listed in the report.

Figure 2: Evaluation Framework for Impact Assessment of Capacity Building Programmes (CBPs)

> The evaluation framework for Studies consists of thirteen parameters categorized under three main categories and five sub-categories

INPUTS (15%)	OUTPUT (70%)	OUTCOMES (15%)

Resources (10%)

1- Financial resources (5%)
2- Human resources (5%)
3 - Partners (5%)

Activities (60%)

4-Topic selection (10%)
5-Content and program delivery (50%)

Short Term[2] (10%)

8- Improvement in skills (2.5%)
9- Creating Awareness (2.5%)
10-Knowledge Enhancement (2.5%)
11- Enhancing Motivation (2.5%)

Participation (10%)

6-Number of participants (5%)
7-Quality of class discussion (5%)

Short to Medium[3] Term (5%)

12-Adoption of Best Practice (2.5%)
13-Policy formulation[5] (2.5%)

Note:
1. Values in parentheses indicate the weights of the parameter/sub-category/category for computation of the overall impact score.
2. Short term indicates a period less than 6 months from the date of conclusion of the programme.
3. Medium term indicates a period from 6 months to 3 years from the date of conclusion of the programme.
4. Policy formulation covers formulation of regulations/ policies/ orders/ guidelines/ approach papers.
5. Total number of questions formulated under the evaluation framework for CBPs is 20 which are listed in the report.

The basis for the weights proposed for each of the categories is discussed below.

1. Output is the most important category since it assesses adequacy and effectiveness of activities. Hence the highest weight was assigned to this category.

2. Input category was assigned a lower weight since it is relatively less important when compared to Output category and also because the responses for impact assessment could be obtained from only a limited set of respondents from the Secretariat of FOR and not from a wider set of respondents from ERCs.

3. Outcomes category was assigned a lower weight since resources were not invested for activities such as conducting dissemination workshops and implementation support to ERCs that were required to ensure achievement of the short, medium and long term outcomes. Further, FOR is only a recommendatory body and hence has a minimal influence on the implementation of the suggested initiatives.

The evaluation frameworks for Studies and CBPs were translated into survey questionnaires in the following manner:

i. Sub-parameters were identified under each of the parameters of evaluation frameworks.

ii. Weights were assigned to each of the sub-parameters.

iii. Questions were designed for each of the sub-parameters.

iv. Questions were then refined after discussing with stakeholders from different ERCs.

v. Responses were sought on a scale of 1 to 5 where a score of 1 indicates least favourable and a score of 5 indicates most favourable.

A survey was conducted to understand the impact of Studies and CBPs. The questionnaires were organized as two sets each with two parts as shown below:

Table 2: Administration of Questionnaires

SN	Set of questionnaire	Questionnaire for	Questionnaire are administered to	Categories for which responses are collated	Number of questions
1	Set-I	Studies	Secretariat of FOR	Input	4
2		CBPs	Secretariat of FOR	Input	4
3	Set-II	Studies	ERCs	Output and Outcome	18
4		CBPs	ERCs	Output and Outcome	16

The summary of the data collection is shown in the table below:

Table 3: Summary of the data forms administered and collected

Set#	Respondents	Part – A (Studies)		Part-B (CBPs)	
		Administered	Collected	Administered	Collected
1	Officers in the Secretariat of FOR	4	4	4	4
2	Chairpersons/Members and Officers in 28 ERCs	58[1]	41	57[2]	35
	Total	62	45	61	39
	% Response		73%		64%

The data collected from the impact assessment survey was observed to be reliable, valid and free of bias based on statistical analysis. The statistical analysis is discussed separately.

Detailed findings on the impact of Studies:

Based on the scores received from the respondents, the total impact score for the Studies was computed as 3.91 on a scale of 1 to 5 which shows that the perceived impact was highly satisfactory.

Figure 3: Studies - Weighted Average Scores under different sub categories and Total Impact score (on a scale of 5)
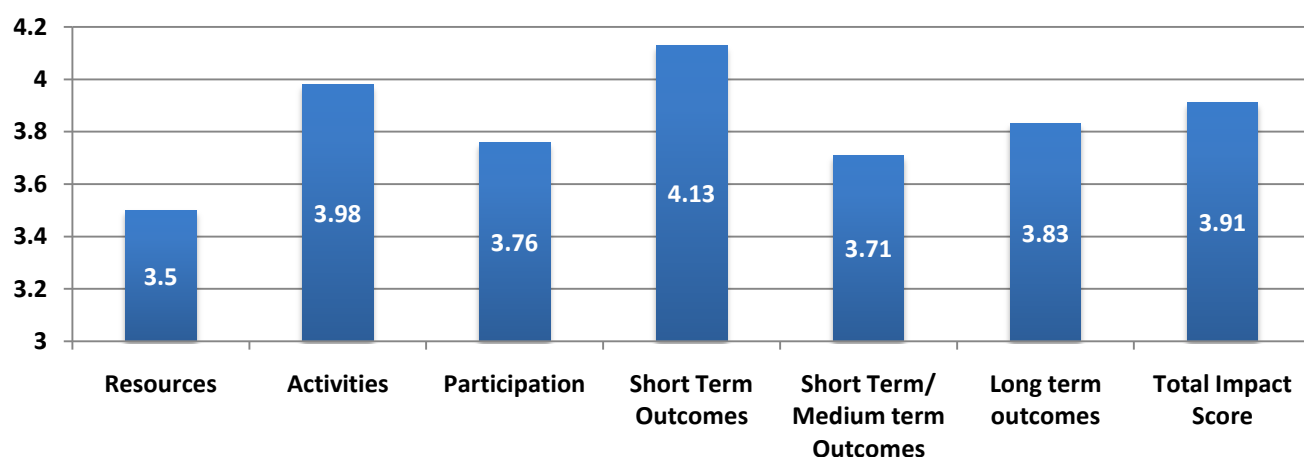
[1] In the survey on Studies, 2 forms were administered to each ERC except DERC where 4 forms were administered
[2] In the survey on CBPs, 2 forms were administered to each ERC except DERC where 3 forms were administered

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The qualitative assessment of under this Sub category is summarized below:

1. **SUB CATEGORY: RESOURCES-** Average score for the parameter, allocation of human resources is only 3.25. There is a scope for enhancing the resources deployed from FOR for conducting the studies for the improvement in the quality of the Studies.

2. **SUB CATEGORY: ACTIVITIES-** Key findings from the qualitative discussions are listed below:

   a. Selected topics were critical and important to the regulatory aspects of the electricity sector. Topics such as the following were suggested for taking up in the future-

      i. Reduction in AT&C losses in areas with marginal HT consumers

      ii. Studies which are specific to particular states of India

      iii. Efficient utilization of coal for power sector

   b. FOR reports were found to be good reference material as a wide range of topics were covered.

   c. ERCs appreciated the quality and content of Study reports during the qualitative discussion.

   d. It desirable to have more focus on recent examples and innovations. It was also suggested relevant international experiences should be studied e.g. Achievement of 6% AT&C losses in South Korea, Lower average cost of power in US in spite of higher renewable installation etc.

3. **SUB CATEGORY: PARTICIPATION-** Few stakeholders from ERCs indicated during the qualitative discussions suggested that ERCs should have higher involvement in the Studies.

4. **SUB CATEGORY: SHORT TERM OUTCOMES-** Qualitative discussions indicated that the Studies helped in increasing knowledge and motivation of the stakeholders.

5. **SUB CATEGORY: SHORT TO MEDIUM TERM OUTCOMES –** It was observed during the qualitative discussion that studies such as the following were found to be highly useful in drafting the regulations, orders and in other activities:

   a. Model regulations for Protection of Consumer Interest

   b. Assessment of various renewable energy resources potential in different states of RPO trajectory and its impact on tariff

   c. Model standard of performance regulations for distribution licensees

6. **SUB CATEGORY: LONG TERM OUTCOMES –** It was mentioned during the qualitative discussions that the Studies conducted by FOR were helpful from the environmental perspective. Several studies focussed on better utilization of renewable energy potential which will have a positive impact on environment in long term. It was suggested during the qualitative discussion that more Studies may be conducted on Discom's finances and

viability. It was also suggested that a study on 'Viability of solar projects with Indian equipment sourcing component' may be conducted in future.

Detailed findings on the impact of CBPs:

Total impact score of CBPs was found to be highly satisfactory at 4.01 out of a maximum possible score of 5. Table below shows the score for each of the sub-categories under the impact assessment of CBPs.

Figure 4: Capacity Building Programmes: Weighted Average Scores under different sub categories and Total Impact score (on a scale of 5)
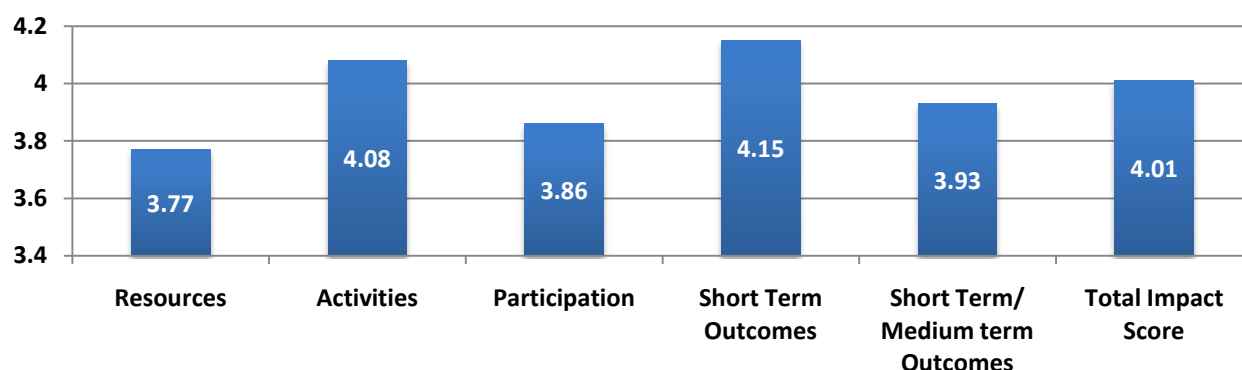
The sub category wise observations for the impact assessment of CBPs are as follows:

1. **SUB CATEGORY: RESOURCES-** Weighted average score for the above mentioned sub category was 3.77 which is the lowest among all sub-categories. There is a scope for enhancing the resources deployed.

2. **SUB CATEGORY: ACTIVITIES-**

    a. The following comments were received during the qualitative discussion:

        i. Training materials provided were adequate.

        ii. Faculty is rated high in terms of subject expertise, effective communication and preparation.

        iii. Participants may be given real world problems so that they gain the knowledge which can be used in their work domain.

        iv. It was also suggested that the number of state specific case studies may be increased. The exchange of state specific knowledge will help in better understanding and more options can be explored.

        v. Topics such as the following were suggested for taking up in the future-

            1. Optimal Power Procurement Planning

            2. Legal aspects in the Indian power sector

            3. Financial or Tariff modelling

b. Some stakeholders suggested during the qualitative discussion that the programme duration should be increased. It was also suggested that the CBPs should be conducted at least for 4-5 days to facilitate in-depth understanding of the subject.

3. **SUB CATEGORY: PARTICIPATION-** Some of the officers from ERCs informed that the mix of participants was adequate and versatile. However, few other officers from ERCs had the opinion that mix of participants should be homogeneous for a particular programme to ensure a similar level of competencies and initial understanding of the subject. It was suggested during the qualitative discussion that since Secretaries plays a crucial role in the functioning of the ERCs, programmes should also be conducted focussing on the Secretary level.

It was observed that mix of backgrounds (financial/technical/ regulatory) of participants in programme provides an effective platform for exchanges of ideas which can be improved further by involvement of participants from ERCs in other countries. It was highlighted that the quality of the CBPs can be improved by conducting the programmes in universities which have specialized training facilities.

4. **SUB CATEGORY: SHORT TERM OUTCOMES**
   .**SUB CATEGORY: SHORT/ MEDIUM TERM OUTCOMES –**

   It was observed during the qualitative discussion that the insights gained from an international case study on fuel audit had resulted in policy implementation and thus saving of money in a particular state.

Segment wise analysis:

Segment wise analysis is conducted to understand the variations in the impact as perceived by different segments of stakeholders.

VARIATION IN THE IMPACT PERCEIVED BY CHAIRPERSON/MEMBER LEVEL AND OFFICER LEVEL RESPONDENTS-

Figure below shows that officer level stakeholders perceived a higher positive impact than Chairperson/Member level stakeholders in the case of both Studies and CBPs. This indicates higher expectation level from Chairperson/Member level stakeholders.

Figure 5: Studies and CBPs: Impact scores for Chairperson/Member level and Officer level (on a scale of 5)[3]

Studies (3.91)	Chairperson/ Member level	3.88
	Officer Level	3.94
CBPs (4.01)	Chairperson/ Member level	3.88
	Officer Level	4.13

Impact Score
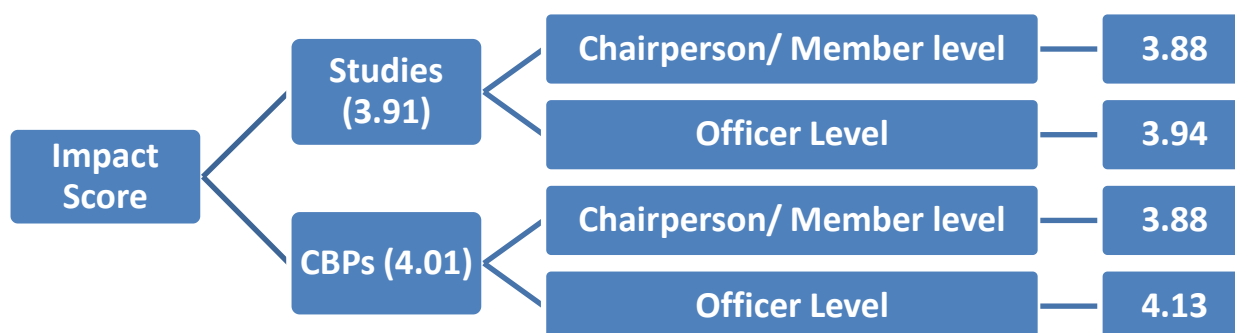
VARIATION IN THE IMPACT PERCEIVED BY RESPONDENTS IN SMALL STATES AND LARGE STATES -

Figure below shows that ERCs in small states perceived a higher positive impact than ERCs in large states. This is may be due to the following reasons:

(i)   better utilization of FOR's Studies and CBPs by ERCs in small states

(ii)   higher need for support to ERCs in large states

Figure 6: Studies and CBPs: Impact scores for small states and large states (on a scale of 5)[4]

Studies (3.91)	Small states	3.95
	Large states	3.89
CBPs (4.01)	Small states	4.09
	Large states	4.00

Impact Score
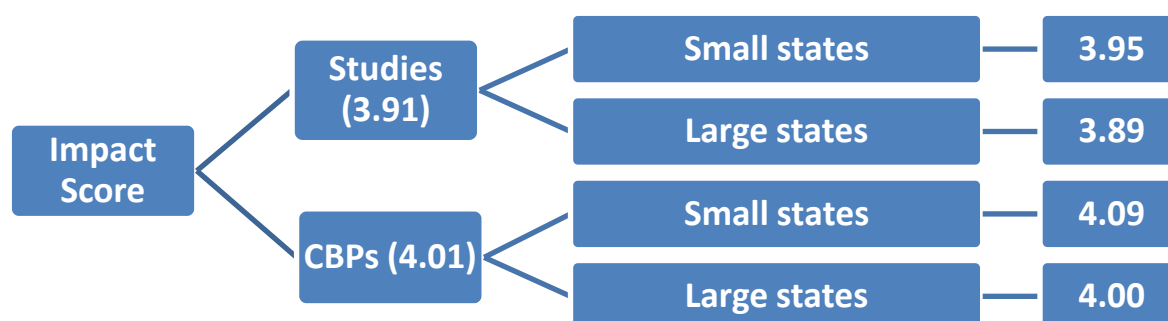
VARIATION IN THE IMPACT PERCEIVED BY RESPONDENTS ACROSS DIFFERENT REGIONS -

Figure below shows that JERC- (Goa and UTs) and ERCs in Southern, North Eastern and Northern regions perceived higher positive impact than the ERCs in Western and Eastern regions. This indicates a need for a higher level of engagement with ERCs in the Western and Eastern regions.

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[3] Separate score for the two levels are computed for Output and Outcome categories but the score for the Input category is kept constant where responses are received only from officers from Secretariat of FOR

[4] ERCs in North Eastern States and Union Territories are categorized under Small States. Other ERCs are categorized under Large States. Responses from FOR (under the Input category) are considered under both Small and Large States.

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Figure 7: Studies and CBPs: Impact scores for different regions (on a scale of 5)
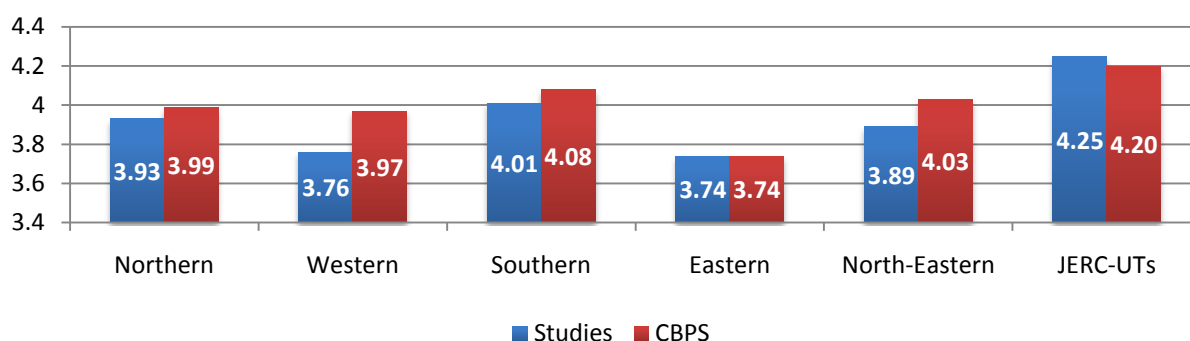
Statistical analysis:

Statistical analysis had been undertaken using Multiple Discriminant Analysis to assess the impact of various Studies and Capacity Building Programs (CBPs). The sub tasks performed during the statistical analysis are presented in the figure below and are discussed in the follow paragraphs.

Figure 8: Statistical analysis framework
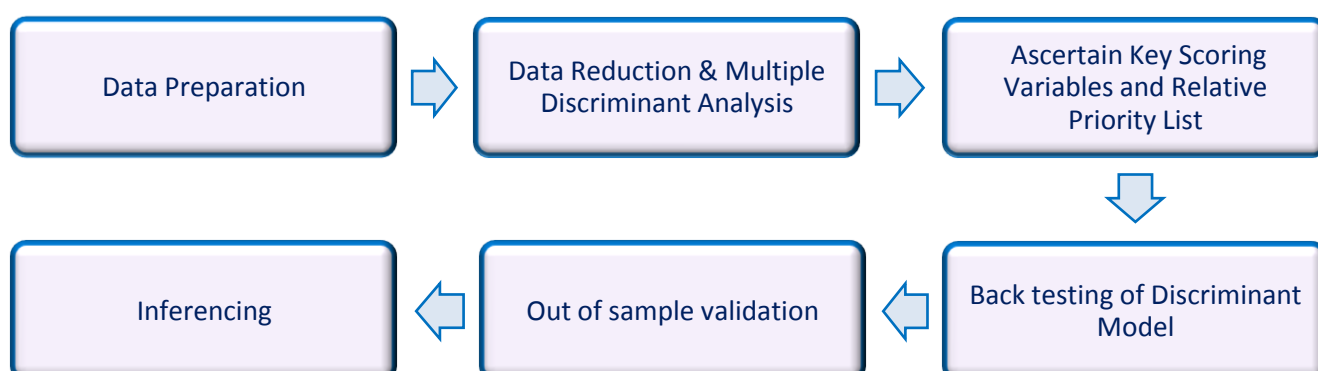
STATISTICAL MODELLING-

The following steps are followed in the statistical modelling:

1. From the responses collected to assess the impact of studies, 35 responses were considered as the sample for the discriminant analysis and 6 for "out of sample validation"
2. Similarly from the responses collected to assess the impact of CBPs, 30 responses were as the sample for discriminant analysis and 5 for "out of sample validation".
3. For the purpose of the multiple discriminant analysis, a three way classification of the ranked responses was arrived based upon the median values of the impact scores for the set of responses :
    i. Perceived Impact- Low
    ii. Perceived Impact- Medium

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iii. Perceived Impact- High

4. A Fischer discriminant function was developed to represent the classification based on the scoring variables (same as sub-parameters or questions)

5. Structure matrix was developed to represent the correlation of the scoring variables with the discriminating functions.

6. Partial correlation coefficients for each of the scoring variables with respect to the classification are arrived and are used as the basis for modified weights for evaluation frameworks.

DEMONSTRATION OF THE RELIABILITY, VALIDITY AND FREE OF BIAS NATURE OF THE COLLECTED DATA

The reliability, validity and free of bias nature of the collected data were confirmed by the following tests.

1. **Reliability**- A measure is said to have a high reliability if it produces similar results under consistent conditions. Reliability was checked by back testing of the development data set. The discriminant model was back tested successfully with the development dataset. It was observed that 91.4% and 90% of the original grouped cases were correctly classified in the responses for Studies and CBPs respectively.

2. **Validity**- Validity is the extent to which a measurement is well-founded and corresponds accurately to the real world. Validity was checked by "out of sample" validation tests. The discriminant model was successful in the out of sample validation test. It was observed that 83% and 100% of the "out of sample" cases were correctly classified.

3. **Free of Bias** – Different types of bias were avoided by the following techniques:
   a. Selection bias was avoided by administering the questionnaires to all the 28 ERCs across India. Each ERC was requested to provide one response at officer level and one response at Chairperson/Member level.
   b. Data Parity checks were undertaken to ensure even representation of the collected sample. It was observed that the collected samples were well represented across the regions and hence it ensures the parity check. The responses received from different regions in terms of percentage of ERCs providing response from a particular region are depicted in figure below:

Figure 9: Region wise responses received from ERCs (%)
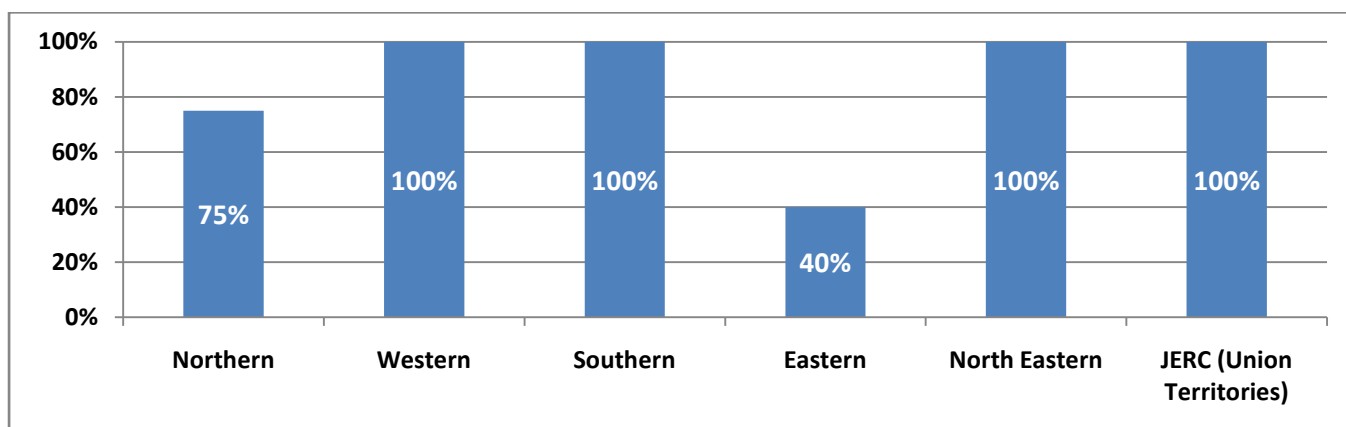
IMPACT ASSESSMENT BASED ON REVISED WEIGHTS BASED ON PARTIAL CORRELATION COEFFICIENTS:

Partial correlation coefficients were used to arrive at the weights for each of the sub-parameter under Output and Outcomes categories. A nominal weight of 1% was given to parameters that had a negative partial correlation coefficient. The weights thus arrived for different sub-parameters under the evaluation framework for CBPs and Studies is presented in the report. The impact scores based on a scenario using weights arrived from the partial correlation coefficients were compared to the scores computed based on the weights used in the evaluation framework are compared below. The percentage difference was marginal being -0.8% and -1.8% in the case of Studies and CBPs respectively. Following table shows the impact score based on weights used in the evaluation framework and the weights derived based on partial correlation coefficients.

Table 4: Impact score based on judgement and partial correlation

Program	Impact Score based on weighs used in the evaluation framework	Impact Score based on the weights arrived based on the partial correlation coefficients
Studies	3.91	3.88
CBPs	4.01	3.94

KEY SUB PARAMETERS TO FOCUS:

The key sub parameters identified in respect of Studies and CBPs using the multiple discriminant analysis and the Structure Matrix are as follows:

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Table 5: Key scoring sub parameters

SN	Q No	Key scoring sub parameters for Studies
1	Q 2	Studies' objectives in terms of clarity, focus and relevance to the ERCs
2	Q 3	Scope of the Studies in terms of comprehensive coverage of intended aspects of the selected topic
3	Q 8	Presentation, clarity and coherence of the report
4	Q 11	Contribution of the Studies in creating awareness about the subjects
5	Q 12	Contribution of the Studies in enhancing the knowledge of the subjects
6	Q 13	Adoption of best practices/ state of the art technologies
7	Q 14	Contribution of the Studies in formulation of regulations/ policies/ orders/ guidelines/approach papers
SN	Q No.	Key scoring sub parameters for CBPs
1	Q 2	Trainers/ faculty in effective delivery/pedagogy of the training modules
2	Q 4	Quality of the programmes in terms of comprehensive coverage of intended topics
3	Q 6	Adequacy of the infrastructure and facilities available for the training programmes
4	Q 7	Quality of the training materials provided
5	Q 10	Quality of the class discussion in the programmes

As shown above, 7 out of the 22 identified sub-parameters under Studies and 5 out of the 20 identified sub-parameters under CBPs are found to be the most important and critical sub-parameters.

Hence, Secretariat of FOR can further enhance the impact of Studies and CBPs by focusing more on the above sub-parameters relative to others.

1. Overview

1.1   Role of the Forum of Regulators

The Forum of Regulators (FOR) has been constituted by the Government of India in terms of Section 166 (2) of the Electricity Act, 2003. The Forum consists of Chairperson of the Central Electricity Regulatory Commission and the Chairpersons of the State Commissions. Chairperson of the Central Electricity Regulatory Commission is the Chairperson of the Forum of Regulators and secretarial assistance to the Forum is provided by the Central Electricity Regulatory Commission. The Forum 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.

The functions of the Forum as outlined in the sub-rule (2) of rule 6 of the Forum of Regulators Rules, 2005 notified under the Electricity Act, 2003 (Act. 36 of 2003) are as under:-

a) Analysis of the tariff orders and other orders of Central Commission and State Commissions and compilation of data arising out of the said orders, highlighting especially the efficiency improvements of the utilities.

b) Harmonization of regulations in power sector.

c) Laying of Standards of Performance of licensees as required under the Act.

d) Sharing of information among the members of the Forum on various issues of common interest and also of common approach.

e) Undertaking research work in-house or through outsourcing on issues relevant to Power sector regulations.

f) Evolving measures for protection of interest of consumers and promotion of efficiency, economy and competition in power sector.

g) Such other functions as the Central Government may assign to it, from time to time.

In discharge of its functioning and in furtherance of the objectives inter alia of the Act and Policies, the Forum has conducted a number of studies and workshops on Capacity Building for the regulators and regulatory staff. The Ministry of Power (MoP) provided plan assistance in the 11th Plan Period 2007-12 for Capacity Building and availing Consultancy Services for conducting Studies. The Studies are listed in Table 6 of the report. The list of Capacity Building Programmes for Chairpersons/Members and Officers are attached in Table 7 and Table 8 respectively. Detailed Reports are available on the website of Secretariat of FOR. The web link to access these reports is given below: http://www.forumofregulators.gov.in/completed.aspx.

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It has been decided to carry out an Independent Impact Assessment of the Studies and Capacity Building Programmes as indicated above.

1.2   Engagement Context

In order to meet its objectives, the Secretariat of FOR has conducted different Studies and Capacity Building Programmes for Electricity Regulatory Commission (ERCs) and regulatory staff during the 11th plan period (FY 2008 to FY 2012). The Ministry of Power (MoP) has provided Plan Assistance to the Secretariat of FOR for Studies and Capacity Building Programmes (CBPs).

The Secretariat of FOR has decided to carry out an **"Independent Impact Assessment of the Studies and Capacity Building Programmes"** which were conducted during the 11th plan period (FY 2008 to FY 2012). ICRA Management Consulting Services Limited (IMaCS) has been engaged by the Secretariat FOR for assistance in impact assessment of these Studies and Capacity Building Programmes.

1.3   Objective

The objective of the study is to prepare a comprehensive report on

(i) Impact Assessment of the Capacity building Workshops undertaken by Secretariat of FOR during the 11th plan.

(ii) Impact Assessment of the Studies conducted by the Secretariat of FOR during the 11th plan.

The Impact Assessment is to be done with due consideration of the fact that Secretariat of FOR is a recommendatory body.

1.4   Scope of Work

The scope of work is detailed below:

1. Design of parameters for Impact Assessment.
2. Impact Assessment keeping in view of the objectives.
3. Detailed analysis of feedback obtained from participants from various State Electricity Regulatory Commissions (SERCs) / Joint Electricity Regulatory Commissions (JERCs) with respect to various Capacity Building Programmes.

2. Studies undertaken by the Secretariat of FOR during the 11th plan period (FY 2008 to FY 2012):

The Secretariat of FOR has conducted 18 Studies in the 11th Five Year Plan period (FY 2008 to FY 2012) from the assistance available from MoP. The Studies address key issues of the Indian Power Sector such as Electricity Reforms and Regulations, Capital Cost Benchmarking for the Distribution Business, Assessment of reasons for Financial Viability of Utilities and other relevant issues. The Studies conducted by the FOR during the 11th plan period (FY 2008 to FY 2012) are summarised below:

Table 6: Studies undertaken by the Secretariat of FOR during the 11th plan period

S. No.	Name of the Study	Conducted during the Year	Objectives of the study
1	Electricity Reforms and Regulations - A Critical review of last 10 years experience	2008-09	1. To review the role of various authorities such as government (central as well as state), government agencies, the regulatory commissions and appellate authorities in the process of reforms in the electricity sector in India 2. Phase wise review of the above. 3. To outline the constraints and gaps on achievements of the objectives set. 4. To suggest the way forward.
2	Model standard of performance regulations for distribution licensees	2008-09	1. To lay down standards of performance and measure performance of the licensees. 2. To ensure that the distribution network performance meets a minimum standard which is essential for the consumers' installation to function properly. 3. To enable the consumers to design their systems and equipment to suit the electrical environment that they operate in. 4. To enhance the quality of the services to meet acceptable customer service standards in the short

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S. No.	Name of the Study	Conducted during the Year	Objectives of the study
			term and gradually move towards improved customer service standards in the long term.
3	Evolving an appropriate model for distribution margin	2008-09	1. To examine the need for implementing Distribution Margin as a basis for allowing returns in distribution business. 2. To examine the feasibility of implementing Distribution Margin as a basis for allowing returns in distribution business, in place of the existing basis of ROE or ROCE and the time frame for implementation of the same. 3. To formulate an appropriate model for implementing the Distribution Margin concept for determination of tariff for distribution business by State Commissions in terms of Section 61 of the Electricity Act, 2003 and the Tariff Policy.
4	Capital cost benchmarks for distribution business	2008-09	1. To develop benchmarks for capital costs of key elements of distribution business, by analysing all-India data with clear distinction between capital costs incurred in Rural/Urban and Overhead / Underground Systems 2. To develop the capital cost benchmarks of key components of the distribution business: 3. To identify cost escalation factors 4. To develop a system for updating the benchmarks for capital cost on year to year basis 5. To suggest norms for other cost overheads such as labor charges, transportation, supervision, contingencies, etc.

S. No.	Name of the Study	Conducted during the Year	Objectives of the study
5	Evolve an appropriate model of incentive-disincentive mechanism for Distribution Utilities	2009-10	1. To study the incentives and disincentives specified by different SERCs for exceeding/non-achievement of norms specified in their MYT Orders for distribution licensees. 2. To study whether the regulated distribution licensees have responded to the incentives and disincentives specified by different SERCs in their MYT Orders. 3. To examine the need for a different incentive/disincentive mechanism for Government owned Distribution Utilities vis-à-vis Private Distribution Utilities. 4. To formulate an appropriate model for implementing the incentive/disincentive mechanism separately for Government owned Distribution Utilities and Private Distribution Utilities under the MYT framework.
6	Implementation of Renewable Energy Certificate	2009-10	Implementation of Renewable Energy Certificate
7	Comparative Analysis of supply codes in 10 states	2009-10	The objective of the study was to do a comparison of supply codes across 10 states based on representation across majority population, regions, industry structure, geographical terrain, ownership structures, etc. States identified in the study include Madhya Pradesh, Uttar Pradesh, Tamil Nadu, Delhi, Andhra Pradesh, Jharkhand, Assam, Punjab, West Bengal and Maharashtra.
8	Implementation of REC Framework-Forbearance Price and Floor Price of REC	2009-10	Implementation REC Framework-Forbearance Price and Floor Price of REC

S. No.	Name of the Study	Conducted during the Year	Objectives of the study
9	Implementation & impact analysis of time of day (TOD) tariff in India	2009-10	1. Study of the implementation of TOD tariff in different states in the country including analysis of the approach of the State Electricity Regulatory Commissions (SERCs) in implementing Time of Day tariff. 2. To make recommendations and suggest a way forward for implementation of TOD tariff.
10	Analysis of tariff orders & other orders of the State Electricity Regulatory Commissions	2009-10	Analysis of Tariff Orders and other related orders pertaining to Generation, Transmission and Distribution as issued between FY 05 to FY 09 while focusing on the following key aspects: 1. Tariff Rationalization; 2. MYT – Base Line Data; 3. Wheeling Charges & Transmission Charges : Separation and Rationalization; 4. Subsidy Payment and its Treatment in Tariff Power Purchase Cost.
11	Assessment of various renewable energy resources potential in different states of RPO trajectory and its impact on tariff	2009-10	1. Estimation of the Renewable Energy potential of various resources in different states and overall availability of renewable resource based electricity in the country. 2. Assessment of the projected demand of electricity in the area of the distribution licensee(s) in each state. 3. Determination of the possible trajectory for setting RPOs and its impact on retail tariff impact on retail tariff. 4. Recommendations, based on the above findings, the desirable minimum RPO to be specified by each State Commission.

S. No.	Name of the Study	Conducted during the Year	Objectives of the study
12	Standardisation of distribution franchisee model	2010-11	To prepare a standard model for Distribution Franchisee (DF) based on: 1. Review of experience of Distribution Franchisee (DF). 2. Identification of issues limiting the adoption of DF models. 3. Identification of regulatory interface in Franchisee Arrangement. 4. Dialogue with stakeholders to understand their perspectives. 5. Design of framework and model contractual documents.
13	Assist the Commission for evolving parameter for generic tariff for Renewable Energy sources	2010-11	Assist commission for evolving parameter for generic tariff for renewable energy sources
14	Assessment of reasons for financial viability of Utilities	2010-11	Assessment and analysis of various commercial parameters and cost elements that have an impact on the financial viability of utilities.

S. No.	Name of the Study	Conducted during the Year	Objectives of the study
15	Standardisation of Regulatory Accounts	2010-11	**General** 1. To analyse present system of Accounting followed by ten (10) different entities in power sector (entities to be mutually selected in consultation with FOR Secretariat) 2. To analyse the requirement of Regulatory Accounting Guidelines (RAG) 3. To analyse the Gap 4. To harmonise the present system of Accounting with Regulatory Accounting Guidelines (RAG) **Development of:** 1. Uniform Regulatory Accounting Manual 2. Charts of accounts 3. Accounting Policies and Rules including the treatment of regulatory Assets and Liabilities 4. Reporting System a) Summary of technical and financial particulars b) Balance Sheet c) Profit and Loss Accounts d) Notes to Accounts e) Cash Flow Statements f) Relevant Schedules
16	Model regulations for Protection of Consumer Interest (Consumer Grievance Redressal Forum, Ombudsman and Consumer Advocacy Regulations)	2010-11	The objective of the report includes the detailed discussion on the approach used to design the Model Regulations for protection of Consumer Interest through creation of consumer grievance rederssal forums and appointment of ombudsman.

S. No.	Name of the Study	Conducted during the Year	Objectives of the study
17	Evolving measures for the effective implementation of Prepaid Metering in the country	2011-12	1. Evaluation of merits of prepaid metering 2. Understanding various legal and regulatory provisions specific to metering and their implication on pre-paid metering. 3. Evolving measures for the effective implementation of prepaid metering in the country under the prevailing provisions.
18	Preparing incentive structure for States for fulfilling Renewable Purchase Obligation (RPO) targets	2011-12	To study the implementation issues and propose an incentive framework for both resource rich and resource deficient states to encourage RPO compliance. The study evaluates various incentive structures and options.

3. Capacity Building Program undertaken by the Secretariat of FOR during the 11th plan period (FY 2008 to FY 2012):

The Secretariat of FOR has conducted 21 Capacity Building Programmes during the 11th plan period (FY 2008 to FY 2012) for the Chairpersons, Members and Officers of the Electricity Regulatory Commissions. These Programmes included workshops or training sessions on topics such as Consumer Protection, Regulations in electricity sector, Energy Efficiency and Demand Side Management (DSM) and other relevant topics. These programmes are divided into two categories given below:

- Capacity Building Programmes conducted by the FOR during the 11th plan period at Chairpersons or Members level.
- Capacity Building Programmes conducted by the FOR during the 11th plan period at Officers level.

The Capacity Building Programmes are summarised in the tables given below:

Table 7: List of Capacity Building Programmes conducted by the Secretariat of FOR during 11th plan period for Chairpersons/Members of Electricity Regulatory Commissions

S. No.	Name of the program	Date	Year	Organised by
1	Orientation programme for the Chairperson and Members of the ERCs	29th May to 6th June	2009	IIM, Ahmadabad
2	Orientation programme for the Chairperson /Members of the ERCs with the proposed study visit to California (USA)	3rd to 10th June	2010	IIM, Ahmadabad
3	Orientation Programme for Chairperson /Members of Electricity Regulatory Commission (ERCs)	3rd to 11th June	2011	IIM, Ahmadabad

Table 8: List of Capacity Building Programmes conducted by the Secretariat of FOR during 11th plan period for Officers of Electricity Regulatory Commissions

S. No.	Name of the program	Date	Year	Organised by
1	Six-days residential capacity building /training programme for Officers of ERCs	30th June to 05th July	2008	IIT-Kanpur
2	Six-days residential training programme on "Open Access and Role of Load Despatch Centre (OA&LDC)" for Officers of ERCs	02nd to 07th February	2009	National Power Training Institute (NPTI), Faridabad
3	Five-days residential training programme on "Consumer Protection issues" for officers of ERCs	16th to 20th February	2009	CIRC at Hotel Regale Inn
4	Capacity Building Programme for Officers of ERCs, on "Various facets of regulatory issues in power sector"	3rd to 8th August	2009	IIT-Kanpur
5	Two-Days residential workshop on "DSM- load research" for Officers of ERCs	7th to 8th September	2009	NPTI, Faridabad
6	A residential training programme on "Finance and Economics" for Officers of ERCs	14th and 18th December	2009	IIM, Bangalore
7	Four-days training programme on "Regulations, Competition and Consumer Issues in the Electricity Sector" for Officers of ERCs	18th May to 21st May	2009	CIRC at Dharamshala (HP)
8	Four-days residential programme on "Demand Side Management and Energy Efficiency (DSM&EE)" for Officers of ERCs	15th June and 18th June	2009	NPTI, Faridabad
9	Four-days residential training programme on "Open Access, role of Load Despatch Centres and Power Markets" for Officers of the regulatory commissions and SLDCs	2nd to 5th November	2009	NPTI, Faridabad
10	Six-days residential training programme on "Demand-side Management" for Officers of ERCs	02nd to 07th March	2009	National Power Training Institute (NPTI), Faridabad
11	Four-days residential training programme on "Legal Aspects of Power Sector Regulation: Experiences and Enforcement Issues" for Officers of Electricity Regulatory Commission (ERCs)	28th June to 1st July	2010	NLSIU, Bangalore

S. No.	Name of the program	Date	Year	Organised by
12	Third capacity building programme for Officers of ERCs on "Various facets of Regulatory issues in Power Sector"	23rd to 28th August	2010	IIT-Kanpur
13	Residential training programme on "Protection of Consumer Interest" for Officers of CGRF, Ombudsman & Consumer Organisation	24th to 25th November	2010	NPTI, Faridabad
14	Residential training programme on "DSM & Energy Efficiency" for Officers of ERCs	16th to 18th November	2010	NPTI, Faridabad
15	Programme on Converged Indian Accounting Standards &IFRS Convergence	5th to 7th August	2010	ICWAI - Institute of Cost and Works Accountants of India
16	4th capacity building/training programme for Officers of ERCs	18th to 23rd July	2011	IIT-Kanpur
17	Training programme on "Demand Side Management" for Officers of ERCs	10th to 14th October	2011	IIT, Roorkee
18	Programme on "Protection of Consumer Interest" for Officers of CGRF and Ombudsman	21st to 23rd March	2012	NPTI, Faridabad

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4. Approach and Methodology

4.1 Evaluation Framework

For the purpose of impact assessment, evaluation frameworks were designed which are broadly based on Logic Frameworks. *'Logic models' or 'Logic frameworks'* are commonly used tools for evaluating the effectiveness of a programme. Logic Models also aid in planning and implementation of various programmes. Logic Models are commonly used by multilateral agencies such as World Bank and ADB to assess the impact of their various schemes and programmes. Some examples are cited below:

1. "Evaluation Framework for Governance Programs: Measuring the Contribution of Communication" by World Bank
   (link:http://siteresources.worldbank.org/EXTGOVACC/Resources/MDTFEvaluationFramew
   orkFINALC.pdf)
2. "Asian Development Bank's Assistance for Rural Electrification in Bhutan—Does Electrification Improve the Quality of Rural Life?" by Asian Development Bank
   (link: http://www.oecd.org/countries/bhutan/46757667.pdf)

3. "Harmonised monitoring and evaluation indicators for procurement and supply management systems" by World Health Organisation

   (link: http://libdoc.who.int/publications/2011/9789241500814_eng.pdf)
4. "Progress Report for the Federal Sustainable Development Strategy 2010-2013" by Sustainable Development Office Environment Canada
   (link: http://www.ec.gc.ca/dd-sd/917F8B09-0BED-4B1E-9540-CBBCBB597642/FSDS-PR-
   06-2011.pdf)

Logic models also serve as a tool for depicting the logical relationships between the various parameters for programme planning and evaluation. The evaluation framework is designed based on the principles of Logic Models. The parameters for the evaluation framework have been identified as necessary to assess the impact of the Studies and Capacity Building Programmes undertaken by the FOR during the 11th plan period. The evaluation frameworks for Studies and Capacity Building Programmes are furnished in the Figure 10 and Figure 11 respectively.

For the purpose of impact assessment, evaluation frameworks had been designed separately for the Studies and CBPs. The evaluation framework consisted of the identified evaluation parameters organized under the categories as shown in the table below. The group of respondents for the survey to assess the impact under each category of parameters is also shown in the table.

Table 9: Classification of categories based on the objectives

Category	Objective	Respondent group
Input	Assesses the adequacy and appropriateness of the resources invested for conducting Studies and CBPs.	Only the Secretariat of FOR would be able to comment on the resources invested and their adequacy. Hence the responses were collected from the officers of the Secretariat of FOR.
Output	Measures the adequacy and effectiveness of the activities undertaken as part of conducting Studies and CBPS.	Two responses were sought from each of the 28 ERCs. One at a Chairperson or Member level and the other at Officer level.
Outcome	Assesses the short, medium and long term achievements of the Studies and CBPs.	Two responses were sought from each of the 28 ERCs. One at a Chairperson or Member level and the other at Officer level.

These categories were further divided into sub-categories as shown in the Figure 10 and Figure 11 for Studies and CBPs respectively. The list of parameters under each category and the assigned weights are also presented in these figures. Under each parameter, one or more sub-parameters are identified and questions are formulated corresponding to each sub-parameter. The number of questions are 22 and 20 in Studies and CBPs respectively. The list of questions is presented in the report.

Figure 10: Evaluation Framework for Impact Assessment of Studies

The evaluation framework for Studies consists of sixteen parameters categorized under three main categories and six sub-categories

INPUTS (10%)

Resources (10%)

1- Financial resources (2.5%)
2- Human resources (2.5%)
3 - Partners (5%)

OUTPUT (70%)

Activities (65%)

4-Topic selection (10%)
5-Objective definition (5%)
6-Scope of the study (5%)
7-Report Structure (5%)
8-Content (40%)

Participation (5%)

9-Involvement of the stakeholders (5%)

OUTCOMES (20%)

Short Term[2] (7.5%)

10-Creating Awareness (2.5%)
11-Knowledge enhancement (5%)

Short to Medium[3] Term (5%)

12-Adoption of Best Practice (2.5%)
13-Policy formulation[5] (2.5%)

Long[4] Term (7.5%)

14-Impact on consumer interest (2.5%)
15-Economic impact (2.5%)
16-Environmental impact (2.5%)

Note:

1. Values in parentheses in indicate the weights of the parameter/sub-category/category for computation of the overall impact score.
2. Short term indicates a period less than 6 months from the date of publishing of the Study reports.
3. Medium term indicates a period from 6 months to 3 years from the date of publishing of the Study reports.
4. Long term indicates a period more than 3 years from the date of publishing of the Study reports.
5. Policy formulation covers formulation of regulations/ policies/ orders/ guidelines/ approach papers.
6. Total number of questions formulated under the evaluation framework for Studies is 22 which are listed in the report.

Figure 11: Evaluation Framework for Impact Assessment of Capacity Building Programmes (CBPs)

The evaluation framework for Studies consists of thirteen parameters categorized under three main categories and five sub-categories

INPUTS (15%)	OUTPUT (70%)	OUTCOMES (15%)
Resources (10%)	*Activities (60%)*	*Short Term[1] (10%)*
1- Financial resources (5%) 2- Human resources (5%) 3 - Partners (5%)	4-Topic selection (10%) 5-Content and program delivery (50%)	8- Improvement in skills (2.5%) 9- Creating Awareness (2.5%) 10-Knowledge Enhancement (2.5%) 11- Enhancing Motivation (2.5%)
	Participation (10%)	*Short to Medium[2] Term (5%)*
	6-Number of participants (5%) 7- Quality of class discussion (5%)	12-Adoption of Best Practice (2.5%) 13-Policy formulation[5] (2.5%)

Note:
1. Values in parentheses indicate the weights of the parameter/sub-category/category for computation of the overall impact score.
2. Short term indicates a period less than 6 months from the date of conclusion of the programme.
3. Medium term indicates a period from 6 months to 3 years from the date of conclusion of the programme.
4. Policy formulation covers formulation of regulations/ policies/ orders/ guidelines/ approach papers.
5. Total number of questions formulated under the evaluation framework for CBPs is 20 which are listed in the report.

These categories are further divided into sub-categories as listed below:

1. Resources (Input)
2. Activities (Output)
3. Participation (Output)
4. Short Term Impact (Outcome)
5. Medium Term Impact (Outcome)
6. Long Term Impact (Outcome)

The basis for the weights proposed for each of the categories is discussed below.

1. Output is the most important category since it assesses adequacy and effectiveness of activities. Hence the highest weight was assigned to this category.

2. Input category was assigned a lower weight since it is relatively less important when compared to Output category and also because the responses for impact assessment could be obtained from only a limited set of respondents from the Secretariat of FOR and not from a wider set of respondents from ERCs.

3. Outcomes category was assigned a lower weight since resources were not invested for activities such as conducting dissemination workshops and implementation support to ERCs that were required to ensure achievement of the short, medium and long term outcomes. Further, FOR is only a recommendatory body and hence has a minimal influence on the implementation of the suggested initiatives.

4.2 Research Process for Analysis

The research process includes two parts- quantitative analysis and qualitative analysis. The qualitative analysis is used to corroborate the findings of the quantitative analysis.

The research process to be followed for this assignment is outlined in Figure 12 and the important aspects were discussed in the subsequent paragraphs.

Figure 12: Systematic representation of Research Methodology
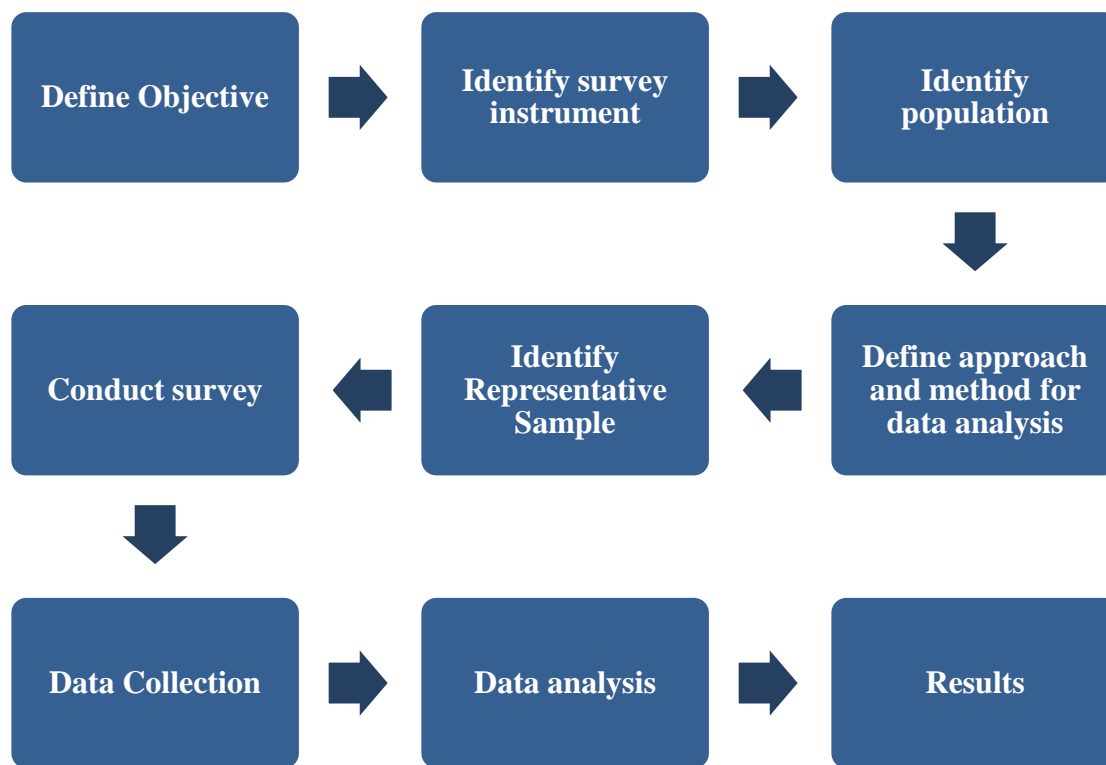
4.3 Design of Questionnaire

The impact of the Study Reports and Capacity Building Programmes, has been assessed through the analysis of the responses or inputs from the various stakeholders. The data for the assignment can be classified into two different heads:

1. The response to the questionnaires- which is objective in nature and provided quantitative inputs.
2. The qualitative inputs from a selected set of Electricity Regulatory Commissions.

Quantitative data was collected by administering survey forms to all ERCs in India. Further, qualitative discussions were conducted with stakeholders from ERCs across India. List of Chairperson/ member/officers from whom qualitative inputs have been gathered is enclosed in Annexure 7.

The evaluation frameworks for Studies and CBPs were translated into survey questionnaires in the following manner:

i. Sub-parameters were identified under each of the parameters of evaluation frameworks.
ii. Weights were assigned to each of the sub-parameters.
iii. Questions were designed for each of the sub-parameters.

iv.   Questions were then refined after discussing with stakeholders from different ERCs.

v.   Responses were sought on a scale of 1 to 5 where a score of 1 indicates least favourable and a score of 5 indicates most favourable.

The questionnaire covers comprehensive number of questions to provide the necessary data for analysis aimed at assessing the impact of Studies and Capacity Building Programmes carried out by the Forum of Regulators (FOR) during the 11th plan period.

While designing the questionnaire, due consideration has been provided for ensuring the following objectives.

1. Objectivity
2. Clarity
3. Consistency
4. Unambiguity
5. Certainty
6. Coverage

The questionnaires were organized as two sets each with two parts as shown below:

Table 10: Administration of Questionnaire

SN	Set of questionnaire	Questionnaire for	Questionnaire are administered to	Categories for which responses are collated	Number of questions
1	Set-I	Studies	Secretariat of FOR	Input	4
2		CBPs	Secretariat of FOR	Input	4
3	Set-II	Studies	ERCs	Output and Outcome	18
4		CBPs	ERCs	Output and Outcome	16

The questionnaires administered to Secretariat of FOR (Set-I) and the questionnaires administered to ERCs (Set II) are furnished in Annexure 1and Annexure 2 respectively.

4.4   Data collection

Survey based on the questionnaire

For this purpose, the questionnaires have been sent to the respondents through emails or paper forms. The respondents were the Chairperson/Members/Officers from Electricity Regulatory Commissions in the

Country (SERCs/JERCs), Members/ Coordinators of the Programme or Study from Secretariat of the FOR.

Detailed discussion with select Electricity Regulatory Commissions (ERCs)

For this purpose, the inputs have been garnered through personal interviews/ telephonic discussion with Chairperson/ Members/ Officers of the ERCs. The qualitative inputs have been used to analyze and corroborate the findings from the analysis of the questionnaire.

4.5 Sample Size

a. **Response collection on input parameters from the FOR:**

The responses to questions on the Input parameters have been provided by concerned members or coordinators from the Secretariat of the FOR. A total of 4 responses have been collected from Secretariat of FOR each for Studies and Capacity Building Programmes.

b. **Response collection on output and outcome parameters from ERCs:**

The questionnaires were administered to 28 ERCs across the country seeking two responses from each commission. A total of 41 responses have been collected for Studies and 35 responses for CBPs from different ERCs. Following table shows the summary of responses collected.

Table 11: Summary of questionnaires administered and collected

Set#	Respondents	Part – A (Studies)		Part-B (CBPs)	
		Administered	Collected	Administered	Collected
1	Officers in the Secretariat of FOR	4	4	4	4
2	Chairpersons/Members and Officers in 28 ERCs	58[5]	41	57[6]	35
	Total	62	45	61	39
	% Response		73%		64%

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[5] In the survey on Studies, 2 forms were administered to each ERC except DERC where 4 forms were administered
[6] In the survey on CBPs, 2 forms were administered to each ERC except DERC where 3 forms were administered

The overall sample size is more than 73% and 64% for Studies and CBPs respectively and hence is considered adequate for the purpose of impact assessment.

4.6 Analytical Framework for Assessing the Impact

IMaCS has deployed appropriate statistical tools for the purpose of assessing the impact of various Studies and Capacity Building Programs (CBPs) on the participants and the organisations that they served. The scope entailed evaluation of the various Studies and the Capacity Building Programs organised by the Forum of Regulators (FOR) during the 11th Plan period. The evaluation set comprises of eighteen (18) Studies and twenty one (21) Capacity Building Programs. The objective of the aforesaid analysis was to ascertain the set of questions, responses to which shall help FOR arrive at a composite scoring methodology that assesses stakeholder satisfaction levels. The questions canvassed vide a structured questionnaire were aimed to solicit responses from survey participants pertaining to the list of Studies and Capacity Building Programmes within the realm of evaluation. Further, a combinatorial methodology was arrived at so as to explain efficacy and impact that the Studies and CBPs seemed to have rendered to its participants. The expected output shall help FOR take cognizance of parts of Studies and CBPs that stakeholder's value, assessment of Studies and CBPs on various parameters. The sub-tasks in the the analytical framework are presented in Figure 13 and are discussed below.

Figure 13: Analytical Framework
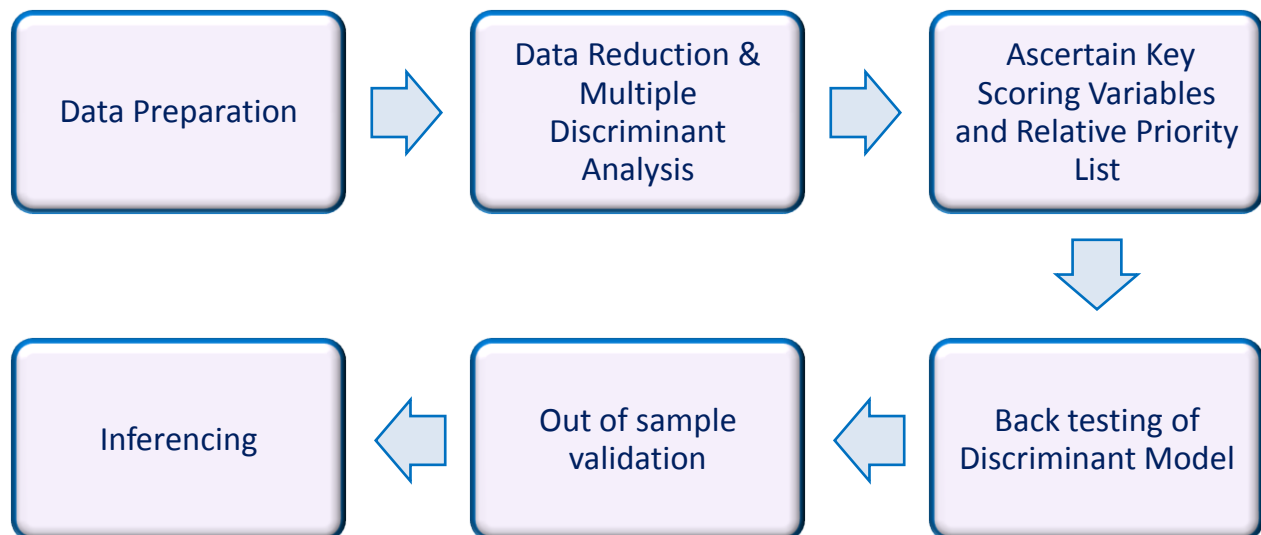
Data Preparation:

1. IMaCS has administered one set of questionnaire on Studies and one set of questionnaire on CBPs conducted by the Forum of Regulators during the 11th plan period to Chairpersons/ Members /Officers of 28 ERCs and collected 41 (out of 62 administered) complete responses for Studies and 35 (out of 61 administered) complete responses for CBPs.

2. For studies 35 samples were considered for the discriminant analysis and 6 for "out of sample validation". Similarly for CBPs, sample of 30 respondents was considered for sample analysis and 5 for "out of sample validation".

3. The scores for each respondent was aggregated. The median for the sample respondents was computed.

4. The responses were collated and aggregated to arrive at a three way classification based upon ranked preferences cited by each respondent towards the Studies and CBPs in question. A three way classification is implemented as follows-
   i. Perceived Impact- Low
   ii. Perceived Impact- Medium
   iii. Perceived Impact- High

Data reduction and Multiple Discriminant Analysis:

The following steps are followed in the multiple discriminate analysis:

Step-1 Fischer discriminant functions were developed to represent the three way classification separately for Studies and CBPs based on the scoring variables (same as sub-parameters or questions).

Step-2 Structure matrices were developed for Studies and CBPs to represent the correlation of the scoring variables with the discriminating functions. The structure matrices for Studies and CBPs are furnished in the Annexure 9 of the report.

Structure matrices provide the final delivery of a scoring algorithm that will help FOR predict/ gauge the reaction/expected benefits to stakeholders from the Studies and/ or from a Capacity Building Program. Structure matrices also provide the preference order of other sub parameters that helped discriminate can also be observed as shown in the figures below:

Figure 14: Questions in descending order of importance based on structure matrix - Studies
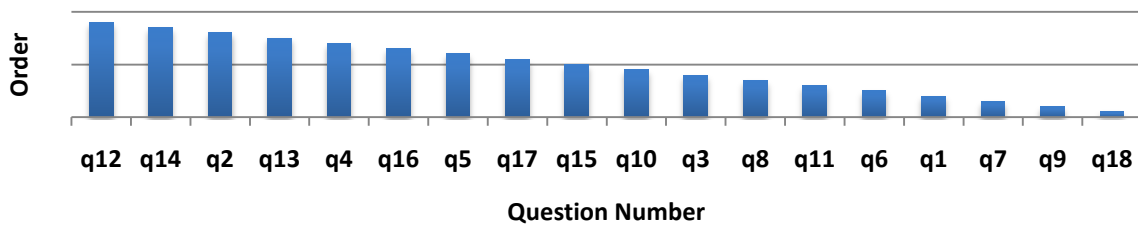
Figure 15: Questions in descending order of importance based on structure matrix - CBPs
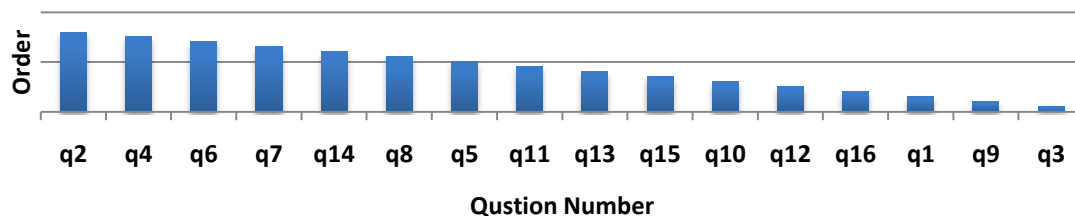
Step-3 Partial correlation coefficients for each of the scoring variables in Studies and CBPs are arrived and are used as the basis for modified weights for evaluation frameworks.

Key scoring variables and relative priority list:

Studies: On the basis Classification Function Coefficients, it was observed that questions 3, 8, 11 and 14 are the key questions that helped discriminate the categorical response sets. The classification function coefficients of the identified important sub parameters for Studies are mentioned in the table below:

Table 12: Classification Function Coefficients - Studies

Classification Function Coefficients			
	Outcome		
	1.00	2.00	3.00
q3	12.997	15.059	18.317
q8	13.811	16.882	19.354
q11	17.501	19.856	23.163
q14	8.298	11.155	13.806
(Constant)	-90.206	-128.092	-179.516

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Further, from the structure matrix for Studies (furnished in Annexure 10), it was observed that questions 12,14,2 and 13 are the most important scoring variables. Hence, the secretariat of FOR can improve the quality of Studies by focusing more on the set of seven sub-parameters listed in the table below which is a union of the important sub-parameters from the classification function coefficients and the top four sub-parameters from the structure matrix.

Table 13: Key scoring sub parameters for Studies

SN	Q No	Description of the sub-parameter	Average Score
1	Q 2	Studies' objectives in terms of clarity, focus and relevance to the ERCs	4.17
2	Q 3	Scope of the Studies in terms of comprehensive coverage of intended aspects of the selected topic	4.02
3	Q 8	Presentation, clarity and coherence of the report	4.05
4	Q 11	Contribution of the Studies in creating awareness about the subjects	4.05
5	Q 12	Contribution of the Studies in enhancing the knowledge of the subjects	4.17
6	Q 13	Adoption of best practices/ state of the art technologies	3.66
7	Q 14	Contribution of the Studies in formulation of regulations/ policies/ orders/ guidelines/approach papers	3.76

Response Distribution: The response distribution for the above mentioned key scoring sub parameters for Studies is shown in the following figure:

Figure 16: Response distribution (%) for critical parameters for Studies
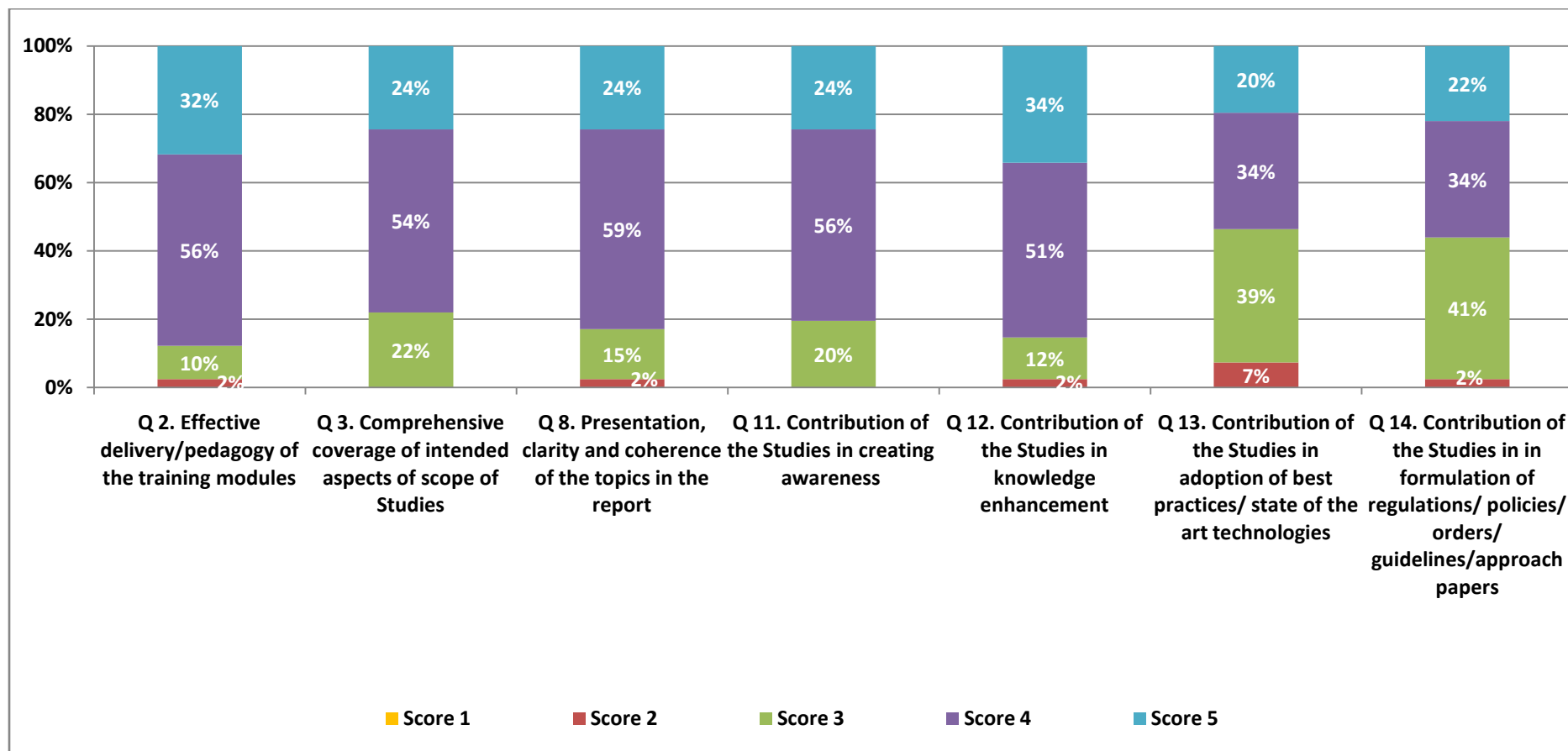
CBPs: On the basis Classification Function Coefficients, it was observed that questions 2, 4 and 10 are the key questions that helped discriminate the categorical response sets. The classification function coefficients of the identified important sub parameters for CBPs are mentioned in the table below:

Table 14: Classification Function Coefficients - CBPs

Classification Function Coefficients			
	Outcome		
	1.00	2.00	3.00
q2	6.823	12.651	14.077
q4	13.510	18.779	21.460
q10	20.489	16.123	22.027
(Constant)	-72.986	-96.482	-140.368

Further, from the structure matrix for CBPs (furnished in Annexure 10), it was observed that questions 2, 4, 6 and 7 are the most important scoring variables. Hence, the secretariat of FOR can improve the quality of CBPs by focusing more on the set of five sub-parameters listed in the table below which is a union of the important sub-parameters from the classification function coefficients and the top four sub-parameters from the structure matrix.

Table 15: Key scoring sub parameters for CBPs

SN	Q No	Description of the sub-parameter	Average Score
1	Q 2	Trainers/ faculty in effective delivery/pedagogy of the training modules	4.06
2	Q 4	Quality of the programmes in terms of comprehensive coverage of intended topics	4.03
3	Q 6	Adequacy of the infrastructure and facilities available for the training programmes	4.37
4	Q 7	Quality of the training materials provided	4.03
5	Q 10	Quality of the class discussion in the programmes	4.03

Response Distribution: The response distribution for the above mentioned key scoring sub parameters for CBPs is shown in the following figure:

Figure 17: Response distribution (%) for critical parameters for CBPs
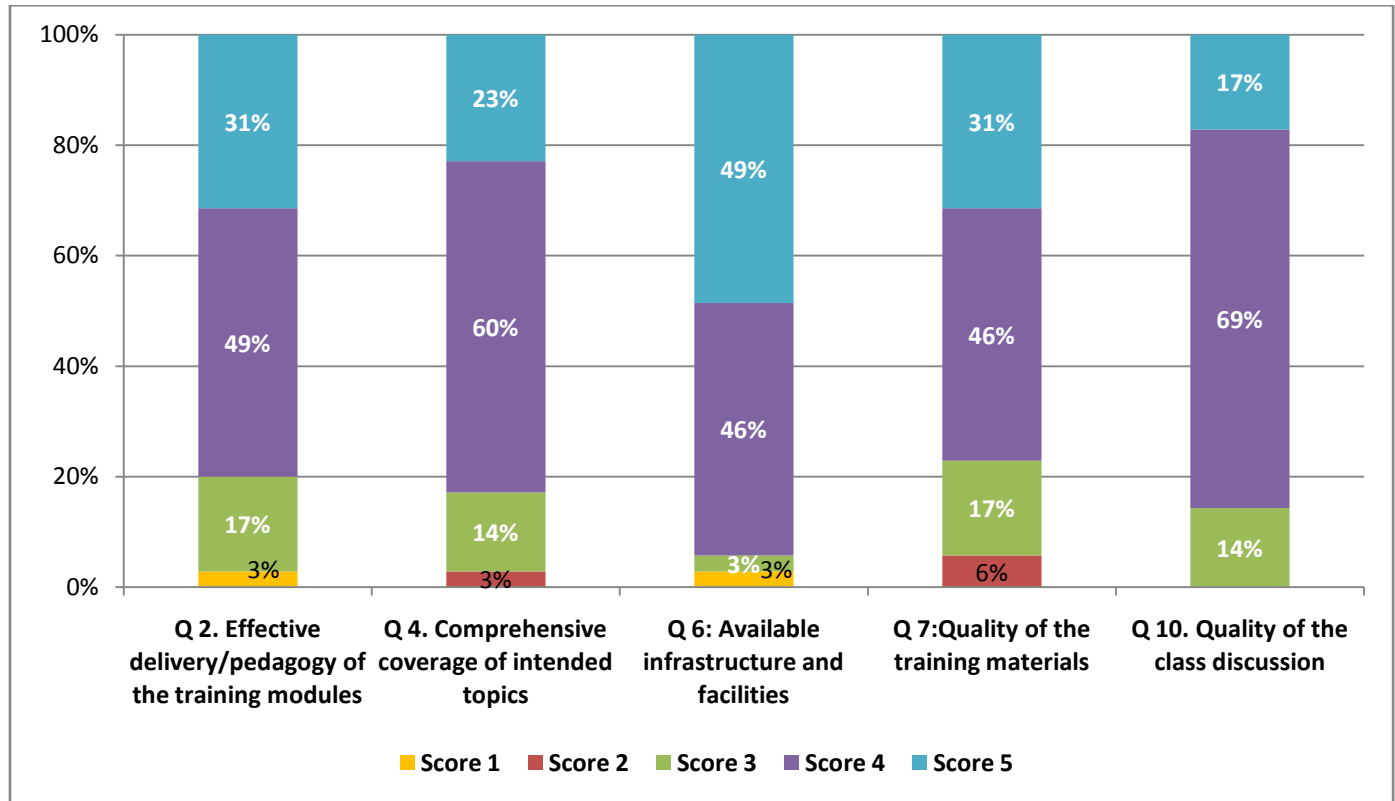
Backtesting of the discriminant model: The classification results for the Studies in the table below indicates the model performance. The figures in the classification results table represent the following:

- Original Group Membership- Number of samples which are classified under three categories High, Medium and Low Impact. These samples are categorised based on the original collected responses in the dataset.

- Predicted Group Membership- Number of samples which are classified under three categories as discussed above. These samples are categorised based on the predicted results of the model.

Hence, the model classification helps in determining the performance of model by indicating the percent of original grouped respondents which are correctly classified.

The following tables summarises the model performance:-

Table 16: Classification Results – Studies

Outcome			Predicted Group Membership			Total
			1	2	3	
Original Group Membership	Count	1	10	0	0	10
		2	1	14	2	17
		3	0	0	8	8
	%	1	100	0	0	100
		2	5.9	82.4	11.8	100
		3	0	0	100	100
91.4% of original grouped cases correctly classified.						

Table 17: Classification Results - CBPs

Outcome			Predicted Group Membership			Total
			1	2	3	
Original Group Membership	Count	1	8	0	0	8
		2	1	13	1	15
		3	0	1	6	7
	%	1	100	0	0	100
		2	6.7	86.7	6.7	100
		3	0	14.3	85.7	100
90.0% of original grouped cases correctly classified.						

Out of Sample Validation:

Out of sample validation for the cases that were not included in the analysis is done and the results are discussed below separately for 'Studies' and 'CBPs':

Studies: When model results are compared with the original outcome, it was observed that 5 out of 6 (i.e. 83.0%) of "out of sample" cases were correctly classified. The results of the classification match obtained during the 'Out of sample validation' for the Studies are shown in the table as follows:

Final Report: Study on Impact Assessment of Plan Assistance to the Forum of Regulators by the Ministry of Power during the 11th Plan Period

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Table 18:Out of sample validation - Studies

S. No.	Outcome	Model Result	Classification match
1	2	2	Correct
2	2	2	Correct
3	2	1	**Incorrect**
4	2	2	Correct
5	2	2	Correct
6	2	2	Correct

CBPs: On the basis of comparison of model with the original outcome, it was observed that 5 out of 5 (i.e. 100.0%) of "out of sample" cases were correctly classified. The classification match for the CBPs between the original samples and the model results is represented in the table below:

Table 19: Out of sample validation - CBPs

S. No.	Outcome	Model Result	Classification match
1	2	2	Correct
2	2	2	Correct
3	2	2	Correct
4	2	2	Correct
5	2	2	Correct

4.7 Inferences

Reliability, Validity and Free of Bias nature of the data:

The reliability, validity and free of bias nature of the collected data were confirmed by the following analysis.

1. **Reliability**- A measure is said to have a high reliability if it produces similar results under consistent conditions. Reliability was checked by back testing of the fisher discriminant model. The discriminant model was back tested successfully with the development dataset. It was

observed that 91.4% and 90% of the original grouped cases were correctly classified in the responses for Studies and CBPs respectively.

2. **Validity**- Validity is the extent to which a measurement is well-founded and corresponds accurately to the real world. Validity was checked by "out of sample" validation tests. The discriminant model was successful in the out of sample validation test. It was observed that 83% and 100% of the "out of sample" cases were correctly classified.

3. **Free of Bias** – Different types of bias were avoided by the following techniques:

    a. Selection bias was avoided by administering the questionnaires to all the 28 ERCs across India. Each ERC was requested to provide one response at officer level and one response at Chairperson/Member level.

    b. Data Parity checks were undertaken to ensure even representation of the collected sample. It was observed that the collected samples were well represented across the regions and hence it ensures the parity check. The responses received from different regions in terms of percentage of ERCs providing response from a particular region are depicted in figure below:

Figure 18: Region wise responses received from ERCs (%)
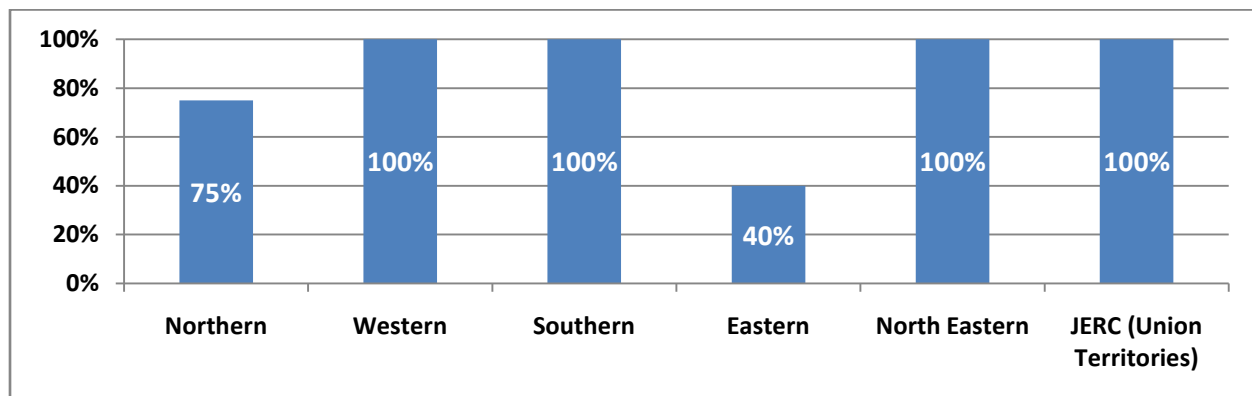
Key sub-parameters that FOR should focus:

As shown in table below, 7 out of the 22 identified sub-parameters under Studies and 5 out of the 20 identified sub-parameters under CBPs are found to be the most important and critical sub-parameters based on the multiple discriminant analysis and the Structure Matrix:

Table 20: Key scoring sub parameters

SN	Q No	Key scoring sub parameters for Studies
1	Q 2	Studies' objectives in terms of clarity, focus and relevance to the ERCs
2	Q 3	Scope of the Studies in terms of comprehensive coverage of intended aspects of the selected topic
3	Q 8	Presentation, clarity and coherence of the report
4	Q 11	Contribution of the Studies in creating awareness about the subjects
5	Q 12	Contribution of the Studies in enhancing the knowledge of the subjects
6	Q 13	Adoption of best practices/ state of the art technologies
7	Q 14	Contribution of the Studies in formulation of regulations/ policies/ orders/ guidelines/approach papers
SN	Q No.	Key scoring sub parameters for CBPs
1	Q 2	Trainers/ faculty in effective delivery/pedagogy of the training modules
2	Q 4	Quality of the programmes in terms of comprehensive coverage of intended topics
3	Q 6	Adequacy of the infrastructure and facilities available for the training programmes
4	Q 7	Quality of the training materials provided
5	Q 10	Quality of the class discussion in the programmes

Hence, Secretariat of FOR can further enhance the impact of Studies and CBPs by focusing more on the above sub-parameters relative to others while planning and designing the programmes.

5. Analysis:

In this Chapter the analysis of the responses to the survey questionnaire is discussed. As mentioned in Chapter 4, two set of questionnaires have been prepared to collect the data-

Both Part-A and Part-B (corresponding to Studies and CBPs) of the Set-1 of the questionnaires comprising of the questions under Input category are administered to four respondents at FOR. All four responses were received. Part A and Part-B (corresponding to Studies and CBPs) of Set-2 of the questionnaires comprising of the questions under Output and Outcome categories are administrated across 28 ERCs in India to a total of 62 and 61 respondents respectively. A total of 41 and 35 samples are collected for Studies and CBPs respectively from different ERCs.

5.1   Analysis for Studies:

The impact score and the parameter-wise analysis for the Studies conducted by Secretariat of FOR are explained in this section:

1. CATEGORY- INPUTS

a. Sub Category: Resources

Q. A) How do you rate the adequacy of the allocation of the financial resources for the Studies?

Q. B) How do you rate the adequacy of the allocation of human resources from the Secretariat of FOR in overall management of the Studies?

Q. C) How do you rate the relevant expertise of the partner for the Studies?

Q. D) How do you rate the partners' deliverables in terms of coverage of the terms of reference for the Studies?

Responses for the questions under sub category 'Resources' were administered to secretariat of FOR. Weighted average score computed for this sub-category is observed to be 3.50 out of a maximum of 5. Key findings are explained below:

It has been observed from the responses received during survey that 100% of the respondents have given a score of 3 or above to questions related to adequate allocation of financial resources and adequacy of the partners. However there is a scope of improvement in the allocation of financial resources to further enhance the effectiveness of reports. It was observed that 75% and 50% of the respondents have given a score of 3 or above and 4 or 5 respectively to the adequate allocation of human resources. Hence, there is a scope for enhancing the resources deployed for conducting the

studies for the improvement in the quality of the Studies. A high level of satisfaction from the relevant expertise of the partners and quality of deliverables can be observed.

The findings of the survey for the input sub category are depicted in chart below:

Figure 19: Sub category- Resources: Scores given by the Respondents
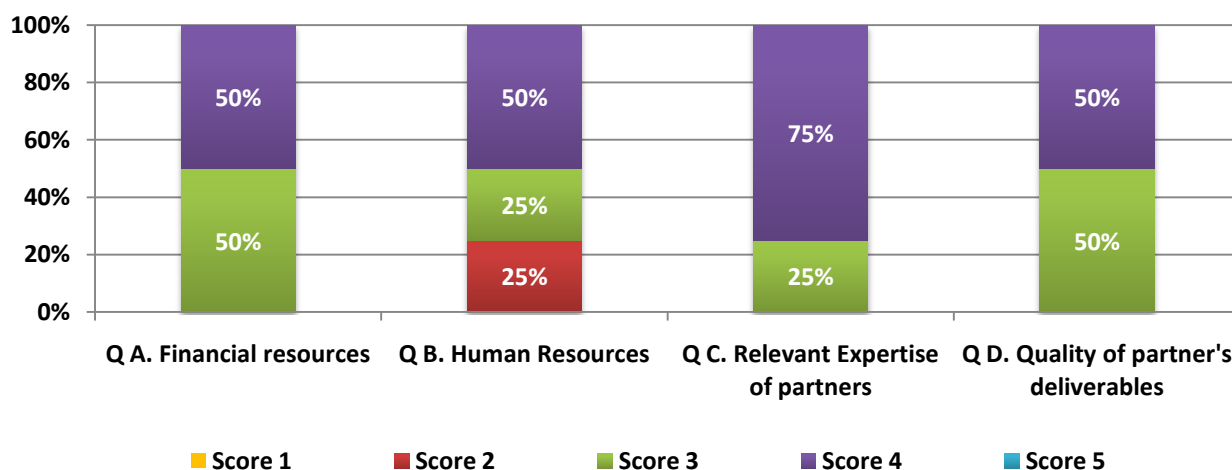
2. CATEGORY- OUTPUTS

a. Sub Category: Activities

Q. 1) **How do you rate the selected topics for Studies in terms of relevance to the Electricity Regulatory Commission (ERCs)?**

Q. 2) **How do you rate the Studies' objectives in terms of clarity, focus and relevance to the ERCs?**

Q. 3) **How do you rate the scope of the Studies in terms of comprehensive coverage of intended aspects of the selected topic?**

Q. 4) **How do you rate the structure of the reports in terms of understand ability and sequence of the topics?**

Q. 5) **How do you rate the reports in terms of approach and methodology adopted?**

Q. 6) **How do you rate the reports in terms of coverage of any of the following: case studies /analytical examples/ national/international practices/ state of the art technologies?**

Q. 7) **How do you rate the quality of the reports in terms of in-depth analysis?**

Q. 8) **How do you rate the reports in terms of presentation, clarity and coherence?**

Q. 9) **How do you rate the reports in terms of being an actionable document?**

Responses for the questions under sub category 'Activities' were administered to the ERCs. The weighted average score for 'Activities' is found to be 3.98. Based on the responses received during the survey following observations can be made:

I. It was observed that 100% of the respondents have given a score of 3 or above for the different sub parameters including adequacy of topic selection, scope of study and approach and methodology of the report. This indicates that ERCs are highly satisfied with the above mentioned sub parameters. The topics selected for the Studies conducted by Secretariat of FOR are found be relevant to the ERCs as these addresses the key issues of the Indian Power Sector such as Electricity Reforms and Regulations, Capital Cost Benchmarking for the Distribution Business, Assessment of reasons for Financial Viability of Utilities and other relevant issues. During the qualitative discussion with the ERCs it was indicated that FOR reports are good reference material as a wide range of topics are covered. Also, selected topics are critical and important to the power sector. It was suggested that ERCs may be consulted for selecting the topics for the Studies. Further, following topics are suggested by the ERCs for the Studies to be conducted by Secretariat of FOR in future-

    i. Reduction in AT&C losses in areas with marginal HT consumers

    ii. Studies which are specific to particular states of India

    iii. Efficient utilization of coal for power sector

    "e.g. *Mechanism for utilization of domestic coal for all non coastal power plants and imported coal for all coastal power plants, based on the GCV of imported coal and fluctuating international prices*."

Officers of ERCs commented during the qualitative discussion that the scope of work is adequately covered in the Study reports.

II. Based on the survey results it was observed that following sub parameters were given a score of 3 or above by 98% of respondents- Clarity, focus and relevance of the objectives, report structure and presentation, clarity and coherence in report. ERCs have appreciated the quality and content of Study reports during the qualitative discussion. The objectives of all the Studies are highlighted in Table 6 of this report. The pie-chart given below indicates the findings of the quantitative analysis. The following list of illustrative objectives for the Studies are suggested during the qualitative discussions:

    i. Issues related to governance

    ii. Action plans to improve the current level of AT&C losses

    iii. Performance of the regulatory system

III. Study reports are rated as 3 or above by 95% of the respondents from ERCs for in-depth analysis and reports being an actionable document. 93% of the respondents have given a score of 3 or above for the coverage of case studies and analytical examples in the Studies. It was commented by a stakeholder during the qualitative discussion that the study on 'Electricity reforms and regulations- a critical review of last 10 years experience' has provided useful

insights and has effectively captured the historical experience. Following views were shared by the staff from different ERCs during the discussion-

i. Respondents who have studied the study reports conducted by Secretariat of FOR have   appreciated the specific studies for providing useful insights and background.

ii. ERCs have also appreciated the quality and content of the study reports.

iii. More focus is required on recent examples and innovations.

iv. More focus shall be given on international experiences. For ex: Achievement of 6% AT&C losses in South Korea, lower average cost of power in US in spite of higher renewable installation etc.

The findings of the survey results are shown in the figure below:

Figure 20: Sub category- Activities: Scores given by the Respondents
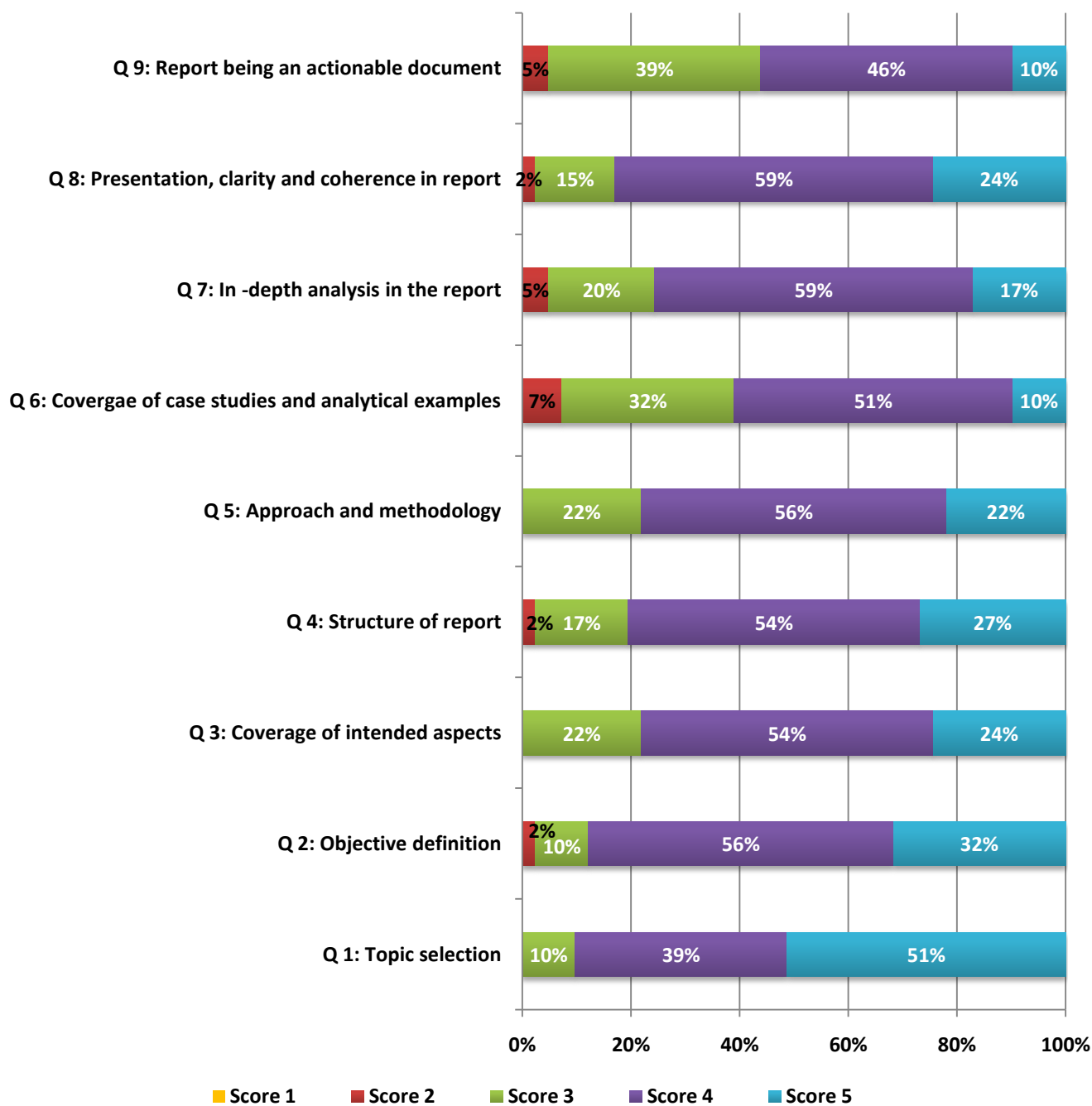
b. *Sub Category: Participation*

Q. 10) <u>How do you rate the adequacy of the participation of ERCs?</u>

Weighted average score for 'Participation' sub category is 3.76. The following observations can be made from the data collected during the survey conducted:

- Respondents rating 3 or above- 98%

- Respondents rating 4 or 5- 66%

- Respondents rating 2- 2%

- Respondents rating 1- None

Some of the qualitative discussions indicated that ERCs would like to have higher involvement in Studies.

Figure 21: Sub category- Participation: Scores given by the Respondents
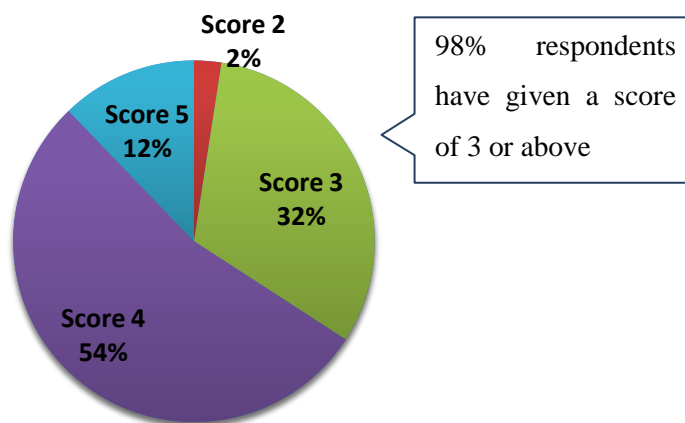
Score 2 2%
Score 5 12%
Score 3 32%
Score 4 54%

> 98% respondents have given a score of 3 or above

3. *CATEGORY- OUTCOMES*

a. *Sub Category: Short Term Outcomes*

Q. 11) <u>How do you rate the contribution of the Studies in creating awareness about the subjects?</u>

Q. 12) <u>How do you rate the contribution of the Studies in enhancing the knowledge of the subjects?</u>

100% and 97% of the respondents have been observed to provide a score of 3 or above to contribution of Studies in creating awareness and enhancing knowledge respectively. 80% and 75% of the respondents have provided a score of 4 or 5 for the above mentioned sub parameters. Officers from ERCs have indicated that the Studies have helped in increasing knowledge and motivation of readers. Weighted average score for Short term outcomes is observed to be 4.13 which is higher than the total impact score of 3.91. The rescores' given by the respondents are represented in the figure below:

Figure 22: Sub category- Short term outcomes: Scores given by the Respondents
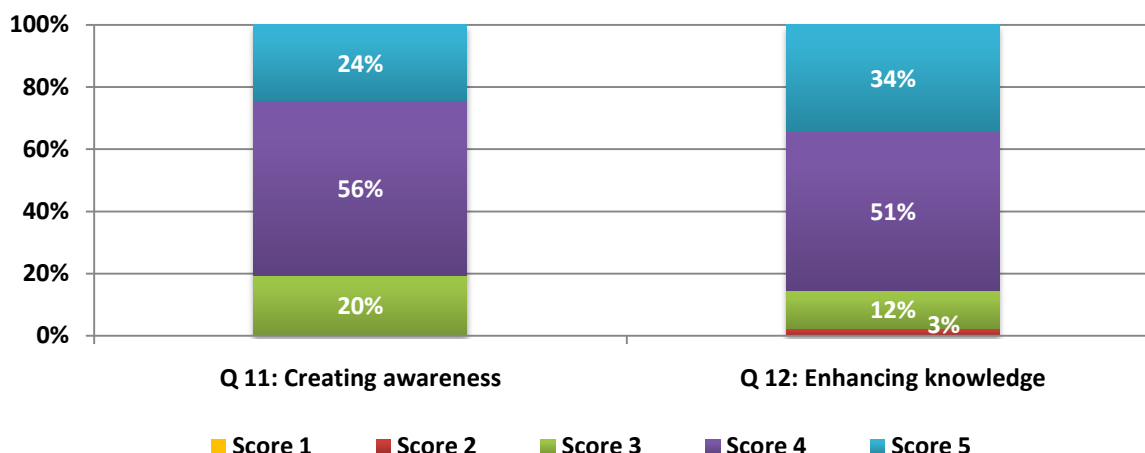
b. _Sub Category: Short to Medium Term Outcomes_

Q. 13) **How do you rate the study reports in helping adoption of best practices/ state of the art technologies?**

Q. 14) **How do you rate the contribution of the Studies in formulation of regulations/ policies/ orders/ guidelines/approach papers?**

It was observed that 93% of the respondents have given a score of 3 or above to the contribution of Studies in adoption of best practices/ state of the art technologies. Also, 98% of the respondents have rated the contribution of Studies in formulation of regulations, policies, orders, guidelines, approach papers to be 3 or above. Based on the data collected during the survey, weighted average score is computed to be 3.71 for Short /Medium term outcomes. The scores given by the respondents are shown in the chart given below:

Figure 23: Sub category- Short to medium term outcomes: Scores given by the Respondents
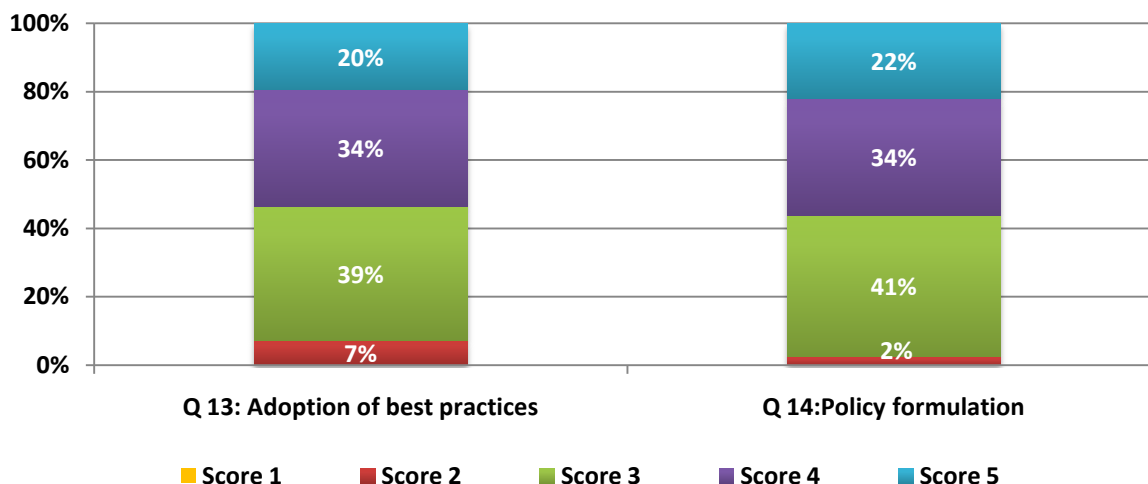
Above observation can be supported by the comments received during qualitative discussion. Qualitative discussion indicated that the following Studies were helpful in drafting the regulations, orders and in other activities performed by ERCs:

- "Model regulations for Protection of Consumer Interest (Consumer Grievance Redressal Forum, Ombudsman and Consumer Advocacy Regulations)"
- "Assessment of various renewable energy resources potential in different states of RPO trajectory and its impact on tariff"
- "Model standard of performance regulations for distribution licensees "
- "Assist the Commission for evolving parameters for generic tariff for Renewable Energy sources "

Timely preparation of report by FOR has proved to be useful for ERCs to issue amendments and notification of the Regulation. ERCs have adopted the principles laid down under the studies conducted by Secretariat of FOR. Some of the examples are tabulated below:

Final report: Study on Impact Assessment of Plan Assistance to the Forum of Regulators by the Ministry of Power during the 11th Plan Period

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Table 21: Instances where SERCs have benefitted from the Studies conducted by Secretariat of FOR

S. No.	Name of the Study	Year	Instances where SERCs have benefitted from the Studies (Examples of orders/guidelines/policies/regulations/approach papers issued by SERC after the Study report conducted by FOR)
1	Model standard of performance regulations for distribution licensees	2008-09	• HPERC [Distribution Performance Standards] Regulations, 2010 • PSERC (Amendment) Regarding procedure for payment of compensation in the event of failure to meet the standards of performance by the Licensee
2	Evolving an appropriate model for distribution margin	2008-09	• Retail Supply Margin Introduced by APERC – Ref: ARR and Tariff Proposals for Retail Supply Business (FY 13) – Although, no reference to distribution margin or FOR has been made
3	Evolve an appropriate model of incentive-disincentive mechanism for Distribution Utilities	2009-10	• CSERC (MYT) Regulations, 2012 – Issued on October 06, 2012 • MERC (MYT) Regulations, 2011 – Issued on February 04, 2011 • GERC (MYT) Regulations, 2011 – Issued on March 22, 2011
4	Comparative Analysis of supply codes in 10 states	2009-10	• Chhattisgarh State Electricity Supply Code, 2011 – Issued on November 28, 2011 • The study also helped several Regulatory Commissions including MERC, BERC, HPERC, MPERC, TNERC, etc, make amendments to its existing code
5	Implementation of REC Framework- Forbearance Price	2009-10	• Several States announced RPO targets for its obligated entities. Visibility of price range increased confidence among the renewable energy players

S. No.	Name of the Study	Year	Instances where SERCs have benefitted from the Studies (Examples of orders/guidelines/policies/regulations/approach papers issued by SERC after the Study report conducted by FOR)
	and Floor Price of REC		
6	Implementation & impact analysis of time of day (TOD) tariff in India	2009-10	• Although many States had already implemented ToD Tariffs prior to this study, it helped them understand overall framework required for implementation of ToD Tariff
7	Standardization of distribution franchisee model	2010-11	• Bihar has recently allotted distribution franchisee for improvement of financial condition and AT&C losses in the areas where these are substantial. DPSC and SMPL Infra have bagged the distribution franchisee in Gaya and Bhagalpur region respectively. Rajasthan has also recently initiated the process for award of distribution franchisee.
8	Standardisation of Regulatory Accounts	2010-11	• In the discussion paper on Multi-Year Tariff Regulations for the Second Control Period, GERC mentioned the following: *"It is proposed that based on FOR recommendations, as and when published, GERC may notify the Regulatory Accounts for the State of Gujarat"* • In May, 2012, DERC has floated a tender for appointment of consultant for Regulations for preparation of Regulatory Accounts – Although, no reference of FOR is made • Thus, Regulatory Commissions are definitely guided by the studies conducted by FOR and the

S. No.	Name of the Study	Year	Instances where SERCs have benefitted from the Studies (Examples of orders/guidelines/policies/regulations/approach papers issued by SERC after the Study report conducted by FOR)
			recommendations thereof
9	Model regulations for Protection of Consumer Interest (Consumer Grievance Redressal Forum, Ombudsman and Consumer Advocacy Regulations)	2010-11	• GERC issued the GERC (Consumer Grievances Redressal Forum and Ombudsman) Regulations, 2011 on April 07, 2011 • DERC also issued DERC GERC (Consumer Grievances Redressal Forum and Ombudsman) Regulations, 2011
10	Evolving measures for the effective implementation of Prepaid Metering in the country	2011-12	• Various States in India have implemented prepaid metering systems in certain areas/for certain consumers. Recently, Bihar Electricity Regulatory Commission (BERC), in the electricity tariff order for 2013-14, directed Bihar State Power (Holding) Company Ltd to install prepaid meters at some government departments and homes in Patna. Also, PVVNL (NOIDA) is in the process of installing pre-paid meters. Pre-paid meters have already been installed in some parts of Navi Mumbai and Pune by MSEDCL

c. _Sub Category: Long Term Outcomes_

Q. 15) **How do you rate the likely contribution of the Studies in terms of protection of consumer interest?**

Q. 16) **How do you rate the likely contribution of the Studies in improving the financial viability of the Power Sector?**

Q. 17) **How do you rate the likely contribution of the Studies in the rationalization of the tariff?**

Q. 18) **How do you rate the likely positive impact of the studies on the environment?**

Weighted average score of long term outcomes is found to be 3.83. The observations for contribution of the different sub parameters of the Studies are listed below. Following figures indicates the percentage of respondents giving a score of 3 or above for different sub parameters-

    a. Protection of consumer interest- 98%

    b. Improving the financial viability of the Power Sector- 95%

    c. Rationalization of the tariff- 95%

    d. Positive impact on the environment- 97%

It was suggested during the qualitative discussion that more Studies may be conducted on Discom's finances and viability. People from ERCs have mentioned during qualitative discussion that the Studies conducted by FOR are helpful from the environmental perspective. Several studies focussed on better utilization of renewable energy potential which will have positive impact on environment in long term. Some officer in ERCs suggested during qualitative discussion that FOR should conduct study on topics such as – Viability of solar projects with Indian equipment component.

Figure 24: Sub category- Long term outcomes: Scores given by the Respondents
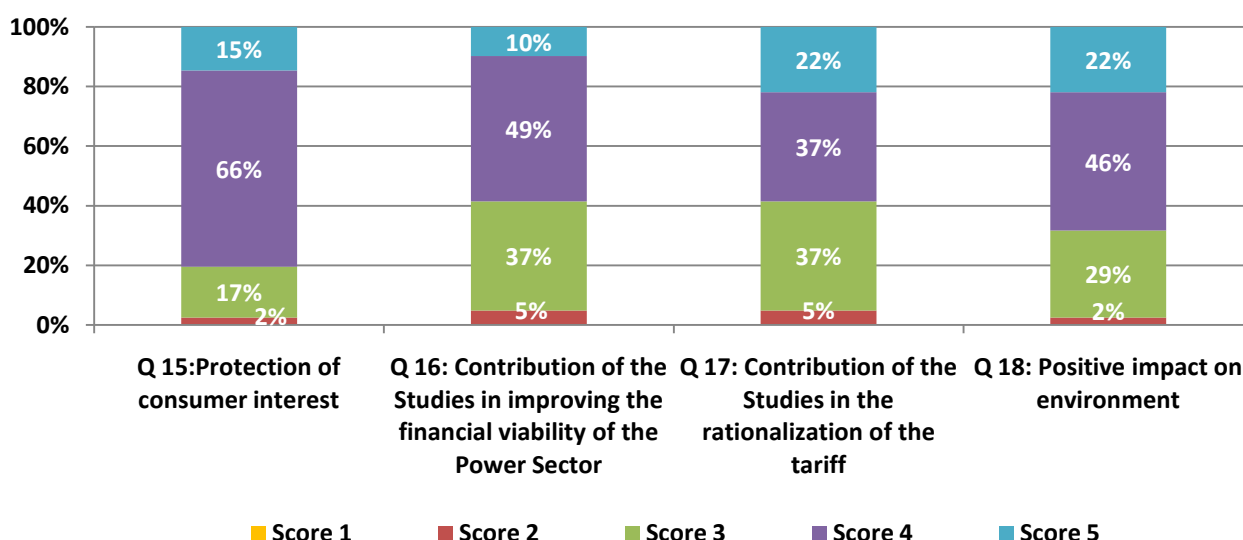
As explained in the evaluation framework for Studies in Figure 10 of chapter 4, the three categories (Input, Output and Outcome) are divided into six sub-categories. There are parameters under the above mentioned sub categories. Each parameter is further classified into sub parameters. The sub parameters correspond to the questions in the questionnaire.

The weighted average score of sub parameters of 'Content' parameter is illustrated in the bar-chart given below. A high average score of Question 8 compared to other sub parameters reflects that the contribution of the Question 8 in the overall scoring of the 'Content' parameter is higher. The weights given to these questions can be depicted in Figure 26. The weighted average score of the Content Parameter is computed to be 3.83 out of a maximum of 5.

Figure 25: Content - Average score of sub parameters
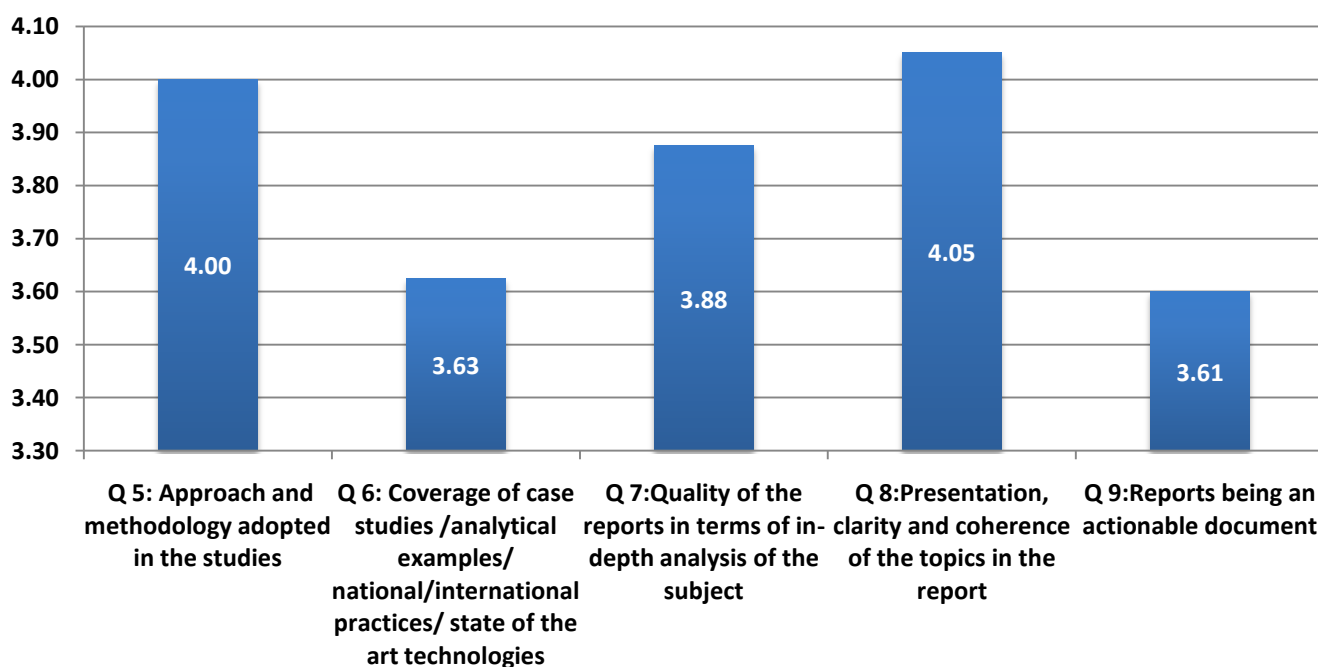
Figure 26: Content - Weights assigned to the sub parameters

Q 5: Approach and methodology adopted in the studies	Q 6: Coverage of case studies /analytical examples/ national/international practices/ state of the art technologies	Q 7:Quality of the reports in terms of in-depth analysis of the subject	Q 8:Presentation, clarity and coherence of the topics in the report	Q 9:Reports being an actionable document
8%	8%	8%	8%	8%
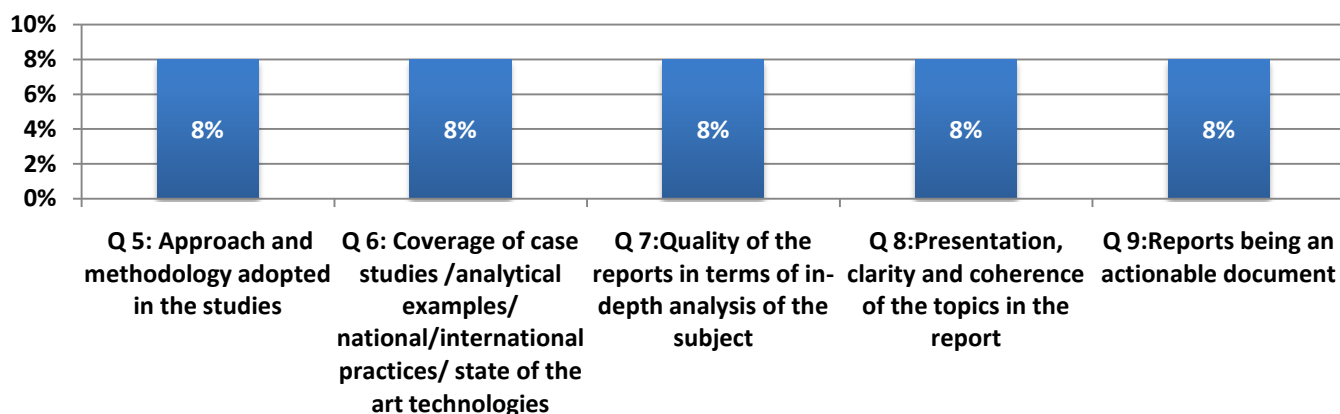
Further, the brief assessment of the Studies conducted by Secretariat of FOR like protection of consumer interest, promotion of renewable energy sources, Demand Side Management etc is as follows:

1. The studies conducted by Secretariat of FOR on Model regulations (like Model Regulations on Standard Of Performance (SOP), Model regulations for Protection of Consumer Interest etc) have helped in bringing uniformity in the ERCs and encouraging the certainty in the Power Sector.

2. The Study reports on model regulations have helped SERCs/JERCs in the country to adopt the regulations partially or fully. The ERCs have made changes in the provisions of the model regulations based on suitability for their state.

3. Assessment of reasons for financial viability of Utilities for 10 different states in India

    i. The Study on "Assessment of reasons for financial viability of Utilities" for 10 different states in India has highlighted the major issues that have high impact on the financial viability of the utilities. The ,major issues identified in the report include:

        a. Timeliness of tariff determination process/ tariff revision

        b. Disallowance of legitimate costs

        c. Fuel Purchase Adjustments

        d. Untreated gap/Regulatory Assets

    ii. Based on the identified issues 'Model Regulations' have been framed by the Secretariat of FOR to address the issues. Based on the study conducted by FOR, APTEL suo- motu order OP no 1 of 2011 has been issued directs the SERCs/JERCs to perform the following:

        a. Revision of tariff every year

b. Initiating suo- moto hearings on tariffs if tariff revisions are not filed by Discoms

iii. The study has resulted in issuance of tariff order for retails supply for FY 2012-13 by 26 states in India.

iv. As per the section 10.2 of the APTEL's Judgment OP no 1 of 2011 *"In a study conducted by Forum of Regulators of ten States for assessment of tariff revision and financial viability of DISCOMS (published in November, 2010), it is estimated that additional increase to the tune of 1% to 39% is required to fully recover the cost of supply"* (*source- APTEL OP no 1 of 201 1*). http://aptel.gov.in/judgements/OP%20NO.1%20OF%202011.pdf

4. Studies in Renewable Energy sector-

    i. Following studies have been conducted by Secretariat of FOR on Renewable Energy sector-

        a. Implementation of Renewable Energy Certificate

        b. Implementation of REC Framework - Forbearance Price and Floor Price of REC

        c. Assessment of various renewable energy resources potential in different states of RPO trajectory & its impact on tariff

        d. Assist the Commission for evolving parameters for generic tariff for Renewable Energy sources

        e. Preparing incentive structure for States for fulfilling Renewable Purchase Obligation (RPO) targets

    ii. As an outcome of the studies mentioned above, several ERCs in the country have adopted the regulations on REC mechanism and RPO targets. This has brought the competition in the renewable energy market thus helping in increasing the efficiency in terms of use of renewable energy resources.

5. Standardization of distribution franchisee model-

    i. The objective of this study is to frame a standard model for Distribution Franchisee (DF) based on the review of experience of Distribution Franchisee (DF) and the discussion with different Stakeholders. This study was useful in designing of framework and model contractual documents.

    ii. Ministry of Power (MoP) has adopted the standard bid documents (SBD) prepared by Secretariat of FOR for preparation of SBD for appointment of DF in urban areas. These documents are adopted with certain modification based on the DFs.

6. DSM Regulations-

    i. The DSM regulations evolved by Secretariat of FOR has aided in being the guiding document to the ERCs while drafting the DSM regulations. Required modifications

are being done for the State specific attributes. These model regulations have been adopted by several states in India.

Based on the responses received during the survey it was observed that the weighted average scores (out of 5) for the 'Activities' and 'Short term outcomes' sub categories is more than the total impact score. The weighted average score, median and average scores for each sub category are represented in the graphs given below:

Figure 27: Studies: Weighted Average Scores under different sub categories and Total Impact score (on a scale of 5)
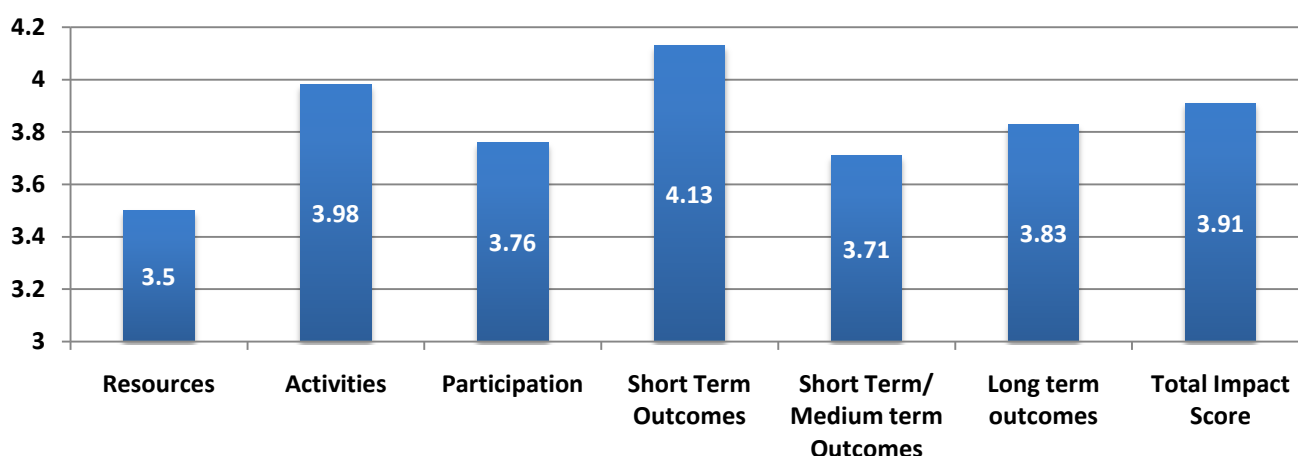
Figure 28: Studies: Average Scores and Median Scores under different sub categories (on a scale of 5)
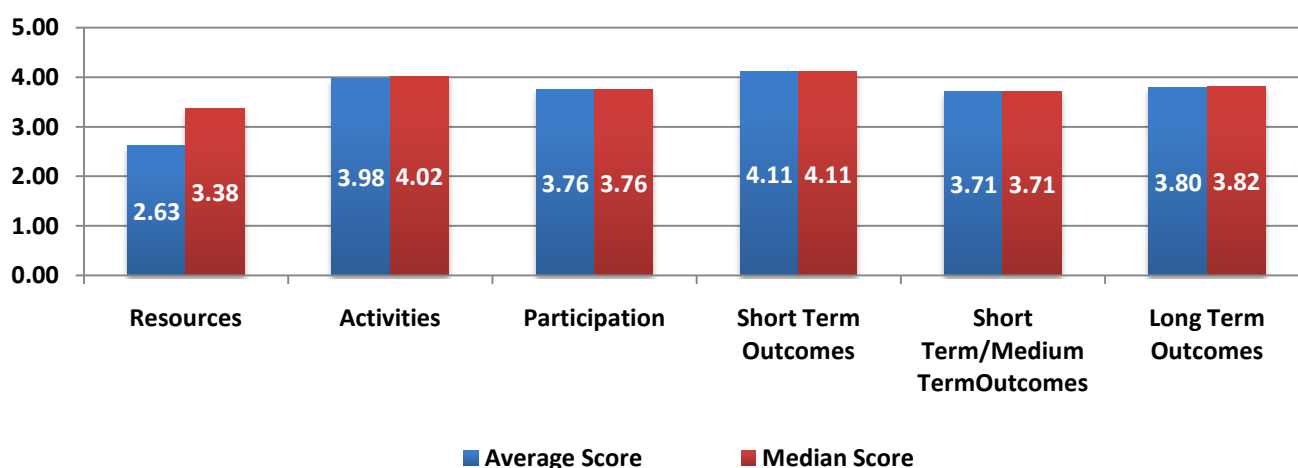
The categorization of the sub parameters based on the weighted score of each sub parameter is shown in the table below. 13 out of 18 sub parameters have weighted score of less than total impact of Studies.

Table 22: Classification of sub parameters of Studies based on the total impact score of 3.91 out of a maximum of 5

Sub parameters- Weighted score is less than total impact score	Score	Sub parameters- Weighted score is more than total impact score	Score
Adequate allocation of human resources	3.25	Contribution of the Studies in protection of consumer interest	3.93
Adequate allocation of financial resources	3.5	Approach and methodology adopted in the studies	4
Quality of partner's deliverables in terms of coverage of Terms of reference	3.5	Comprehensive coverage of intended aspects of scope of Studies	4.02
Reports being an actionable document	3.61	Report structure in terms of understand ability and sequence of the topics	4.05
Coverage of case studies /analytical examples/ national/international practices/ state of the art technologies	3.63	Presentation, clarity and coherence of the topics in the report	4.05
Contribution of the Studies in improving the financial viability of the Power Sector	3.63	Contribution of the Studies in creating awareness	4.05
Contribution of the Studies in adoption of best practices/ state of the art technologies	3.66	Clarity, focus and relevance of objectives of studies	4.17
Relevant Expertise of partners	3.75	Contribution of the Studies in enhancing knowledge	4.17
Adequacy of the participation of ERCs	3.76	Relevance of selected topics	4.41
Contribution of the Studies in formulation of regulations/ policies/ orders/ guidelines/approach papers	3.76		
Contribution of the Studies in the rationalization of the tariff	3.76		
Quality of the reports in terms of in-depth analysis of the subject	3.88		
Positive impact of the studies on environment	3.88		

A brief summary of categorization of categories, sub categories, parameters and sub parameters for the Studies is represented in the table below:

Table 23: Weights and weighted average score of each sub parameter for the Studies

Q. No.	Sub category	Parameter	Sub Parameter	Weight	Weighted average score
			INPUT CATEGORY		
Q A	Resources	Financial Resources	Adequate allocation of financial resources	2.5%	3.50
Q B	Resources	Human Resources	Adequate allocation of human resources	2.5%	3.25
Q C	Resources	Partners	Relevant Expertise of partners	2.5%	3.75
Q D	Resources	Partners	Quality of partner's deliverables in terms of coverage of Terms of reference	2.5%	3.50
		Sub Total		**10.0%**	**3.50**
			OUTPUT CATEGORY		
Q1	Activities	Topic Selection	Relevance of selected topics	10.0%	4.41
Q2	Activities	Objective Definition	Clarity, focus and relevance of objectives of studies	5.0%	4.17
Q3	Activities	Scope of the Study	Comprehensive coverage of intended aspects of scope of Studies	5.0%	4.02
Q4	Activities	Report Structure	Report structure in terms of understandability and sequence of the topics	5.0%	4.05
Q5	Activities	Content	Approach and methodology adopted in the studies	8.0%	4.00
Q6	Activities	Content	Coverage of case studies /analytical examples/ national/international practices/ state of the art technologies	8.0%	3.63
Q7	Activities	Content	Quality of the reports in terms of in-depth analysis of the subject	8.0%	3.88
Q8	Activities	Content	Presentation, clarity and coherence of the topics in the report	8.0%	4.05
Q9	Activities	Content	Reports being an actionable document	8.0%	3.61
Q10	Participation	Involvement of the Stakeholders	Adequacy of the participation of ERCs	5.0%	3.76
		Sub Total		**70.0%**	**3.96**
			OUTCOME CATEGORY		
Q11	Short Term	Creating Awareness	Contribution of the Studies in creating awareness	2.5%	4.05

Q. No.	Sub category	Parameter	Sub Parameter	Weight	Weighted average score
Q12	Short Term	Knowledge Enhancement	Contribution of the Studies in enhancing knowledge	5.0%	4.17
Q13	Short Term/Medium Term	Adoption of Best practices	Contribution of the Studies in adoption of best practices/ state of the art technologies	2.5%	3.66
Q14	Short Term/Medium Term	Policy formulation	Contribution of the Studies in formulation of regulations/ policies/ orders/ guidelines/approach papers	2.5%	3.76
Q15	Long Term	Impact on consumer interest	Contribution of the Studies in protection of consumer interest	2.5%	3.93
Q16	Long Term	Economic impact	Contribution of the Studies in improving the financial viability of the Power Sector	1.25%	3.63
Q17	Long Term	Economic impact	Contribution of the Studies in the rationalization of the tariff	1.25%	3.76
Q18	Long Term	Environmental impact	Positive impact of the studies on environment	2.5%	3.88
Sub Total				**20.0%**	**3.91**
IMPACT SCORE OF STUDIES→ 3.91					

The total impact score of the Studies is computed based on the weights assigned to the sub parameters. Weighted score of each sub parameter is computed by multiplying the average score of the sub parameter multiplied with the assigned weight. The sum of the weighted scores of each sub parameter gives the total impact score of the Studies. **The impact score of the Studies is found to be 3.91 out of a maximum of 5.** Scores given by respondents to different sub parameters of the Studies shows that Studies are appreciated by the respondents. Based on the scores received from the respondents, a total impact score of 3.91 out of a maximum score of 5 is calculated for the Studies. This score indicates that the Studies conducted by the Secretariat of FOR have a high perceived impact on the ERCs.

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Figure 29: Evaluation Framework for Impact Assessment of Studies
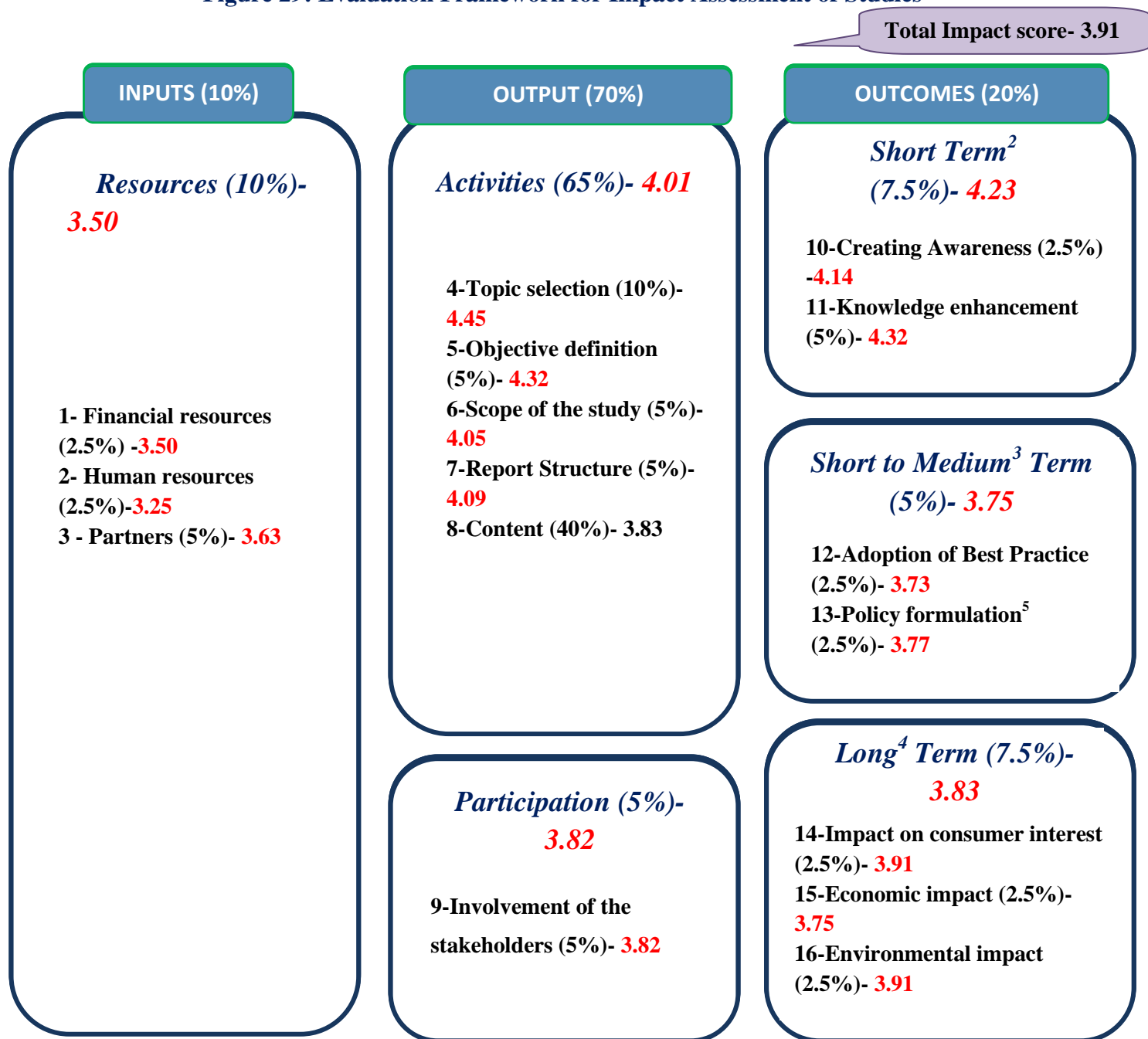
Total Impact score- 3.91

INPUTS (10%)

Resources (10%)- 3.50

1- Financial resources (2.5%) -**3.50**
2- Human resources (2.5%)-**3.25**
3 - Partners (5%)- **3.63**

OUTPUT (70%)

Activities (65%)- 4.01

4-Topic selection (10%)- **4.45**
5-Objective definition (5%)- **4.32**
6-Scope of the study (5%)- **4.05**
7-Report Structure (5%)- **4.09**
8-Content (40%)- 3.83

Participation (5%)- 3.82

9-Involvement of the stakeholders (5%)- **3.82**

OUTCOMES (20%)

Short Term[2] (7.5%)- 4.23

10-Creating Awareness (2.5%) -**4.14**
11-Knowledge enhancement (5%)- **4.32**

Short to Medium[3] Term (5%)- 3.75

12-Adoption of Best Practice (2.5%)- **3.73**
13-Policy formulation[5] (2.5%)- **3.77**

Long[4] Term (7.5%)- 3.83

14-Impact on consumer interest (2.5%)- **3.91**
15-Economic impact (2.5%)- **3.75**
16-Environmental impact (2.5%)- **3.91**

Note: 1. Values in parentheses in black colour indicate the weights of the parameter/sub-category/category.
2. Values in red colour indicate the average scores of the parameter/sub-category/category.
3. Short term indicates a period less than 6 months from the date of publishing of the Study reports.
4. Medium term indicates a period from 6 months to 3 years from the date of publishing of the Study reports.
5. Long term indicates a period more than 3 years from the date of publishing of the Study reports.
6. Policy formulation covers formulation of regulations/ policies/ orders/ guidelines/ approach papers.

5.2 Analysis for Capacity Building Programmes (CBPs):

The analysis of the survey results for the responses collected for the CBPs from Secretariat of FOR and the ERCs in India is described in this section. The impact score and the parameter-wise analysis for the CBPs conducted by Secretariat of FOR are as follows:

1. *CATEGORY- INPUTS*

a. *Sub Category: Resources*

Q. A) **How do you rate the adequacy of the allocation of the financial resources for the Capacity Building Programmes?**

Q. B) **How do you rate the adequacy of the allocation of human resources from the Secretariat of FOR in overall management of the Capacity Building Programmes**

Q. C) **How do you rate the experience/expertise of the partner relevant to the Programmes?**

Q. D) **How do you rate the performance of partner in conducting Capacity Building Programmes as per the agenda of the Programmes?**

It was observed that 100% of the respondents have given a score of 3 or above to the following sub parameters- adequate allocation of financial and human resources and experience and performance of partners. Results of survey for the resources sub category indicate a high level of satisfaction. However, in order to further improve the effectiveness of the programmes, there is scope for deploying more resources from Secretariat of FOR. The weighted average score for the above mentioned sub category is 3.77 out of a maximum of 5. The scores given by the respondents are depicted in the figure below:

Figure 30: Sub category- Resources: Scores given by the Respondents
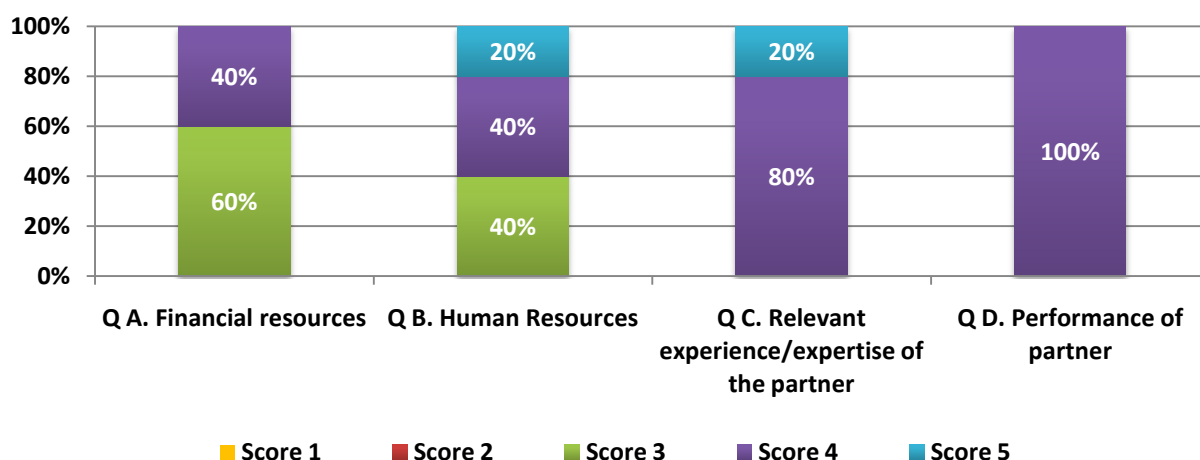
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2. CATEGORY- OUTPUTS

a. Sub Category: Activities

Q. 1) **How do you rate the selected topics for Capacity Building Programmes in terms of relevance to functioning of the ERCs?**

Q. 2) **How do you rate the trainers/ faculty in effective delivery/pedagogy of the training modules?**

Q. 3) **How do you rate the adequacy of the duration of the programmes for covering the various aspects related to the selected topic?**

Q. 4) **How do you rate the quality of the programmes in terms of comprehensive coverage of intended topics?**

Q. 5) **How do you rate the quality of the programmes in terms of presenting the case studies and analytical examples?**

Q. 6) **How do you rate the adequacy of the infrastructure and facilities available for the training programmes?**

Q. 7) **How do you rate the quality of the training materials provided?**

Q. 8) **How do you rate the quality of the training content in terms of covering any of the following aspects: national/international practices/ state of the art technologies in the power sector?**

Weighted average score for 'Activities' is found to be 4.08 which is higher than a total impact score of 4.01. The following observations can be listed from the survey-

I. 97% of the respondents have provided a score of 3 or above for the Delivery/pedagogy of training modules, Comprehensive coverage of intended topics, and available infrastructure and facilities. A high level of satisfaction can be seen which is supported by the following comments received during the qualitative discussion:

    i. Faculty and training materials provided were adequate.

    ii. Faculty was well prepared.

    iii. Faculty has good understanding of subject and was able to communicate the same.

II. 94% of the respondents have given a score of 3 or above for the sub parameters including- relevance of topic selection, presentation of case studies and analytical examples, quality of the training materials and coverage of national/international practices/ state of the art technologies. The survey results have shown that the respondents are highly satisfied with the above mentioned sub parameters. However, it was advised that participants should be given real world problems so that they gain the knowledge which can be used in their work domain. It was also suggested that the number of state specific case studies shall be increased. The exchange of state specific

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knowledge will help in better understanding and more options can be explored. In order to enhance the impact of the Programmes conducted by Secretariat of FOR ERCs have suggested the following list of topics-

    i. Optima Power Procurement Planning

      "Considering scheduling of power, purchase of power through all modes includes power exchanges and benefit through selling surplus"

    ii. Legal aspects in the Indian power sector

    iii. Financial or Tariff modelling

III.   91% of the respondents have rated duration of programmes as 3 or above out of 5. Further, it was suggested during the qualitative discussion that the programme duration should be increased. It was suggested that the CBPs should be conducted at least for 4-5 days for in depth understanding of the subject.

The key findings of survey results are shown in the following figure:

Figure 31: Sub category- Activities: Scores given by the Respondents

Q 8:Coverage of national/international practices/ state of the art technologies — 6%, 23%, 49%, 23%

Q 7:Quality of the training materials — 6%, 17%, 46%, 31%

Q 6: Available infrastructure and facilities — 3%, 46%, 49%

Q 5:Presentation of case studies and analytical examples — 6%, 20%, 60%, 14%

Q 4:Coverage of intended topics — 3%, 14%, 60%, 23%

Q 3:Duration of programmes — 9%, 23%, 37%, 31%

Q 2: Delivery/ pedagogy of training modules — 3%, 17%, 49%, 31%

Q 1: Topic selection — 6%, 6%, 31%, 57%

Legend: ■ Score 1 ■ Score 2 ■ Score 3 ■ Score 4 ■ Score 5

b. Sub Category: Participation

Q. 9) **How do you rate the appropriateness of number of participants invited from your Commission for the programmes?**

Q. 10) **How do you rate the quality of the class discussion in the programmes?**

It has been observed that only 89% of the respondents have rated the appropriateness of number of participants for the CBPs as 3 or above. This is further supported by the feedback received from ERCs. Some of the officers from ERCs have informed that the mix of participants was adequate and versatile. However, few other officers from ERCs had the opinion that mix of participants should be homogeneous for a particular programme to have the same level of initial understanding of the subject. One of the staff members had the opinion that the number of technical members shall be increased as they undertake many activities in the state. It was suggested during the qualitative discussion that since Secretary plays a crucial role in the functioning of the ERCs programmes should also be conducted at secretary level. Respondents were found to be satisfied with the quality of the class discussion as 100% of the respondents have rated it as 3 or above. It was informed that mix of backgrounds (financial/technical/ regulatory) of participants in programme provides an effective platform for exchanges of idea which can be improved further by involvement of International regulators. It was highlighted that the quality of the CBPs can be improved by conducting the programmes in universities which have specialized training facilities. Weighted average score calculated is 3.86 for Participation. Following findings have been depicted in the figure below:

Figure 32: Sub category- Participation: Scores given by the Respondents
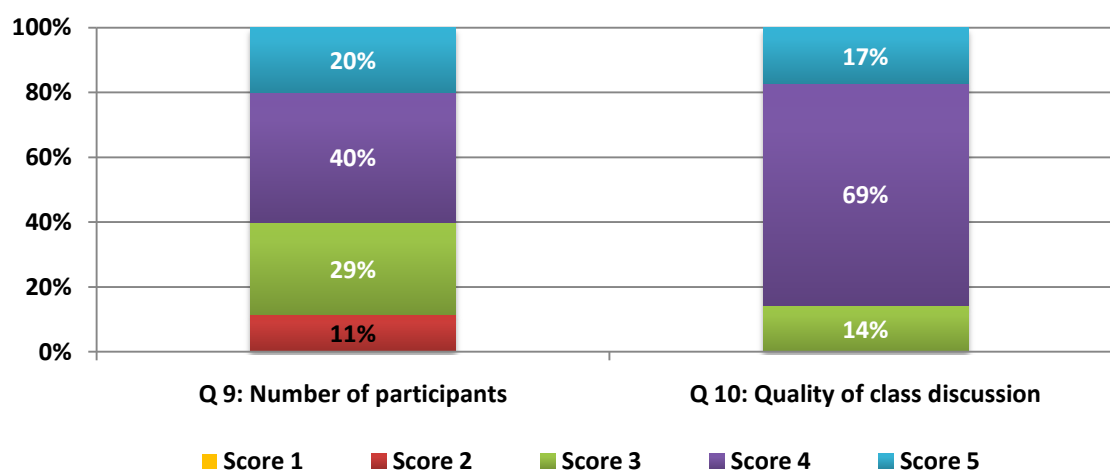
3. CATEGORY- OUTCOMES

a. Sub Category: Short Term Outcomes

Q. 11) **How do you rate the improvement in the skill set of participant after the programmes?**

Q. 12) **How do you rate the contribution of the programmes in creating awareness about the subject in the participant?**

Q. 13) **How do you rate the contribution of the programmes in enhancing the knowledge of the subject among the participants?**

Q. 14) **How do you rate the contribution of the programmes in enhancing the motivation level and propensity to take initiatives?**

The observation from the survey results are as follows: 100% of the respondents have given a score of 3 or above for contribution of CBPs in improvement of skill set and 97% of the respondents have provided a rating of 3 or above for the following sub parameters- Contribution of programmes in creating awareness, enhancing knowledge and enhancing motivation. Since the weighted average score is found to be 4.15, a high level of satisfaction can be seen for Short term outcomes.

Figure 33: Sub category- Short term outcomes: Scores given by the Respondents
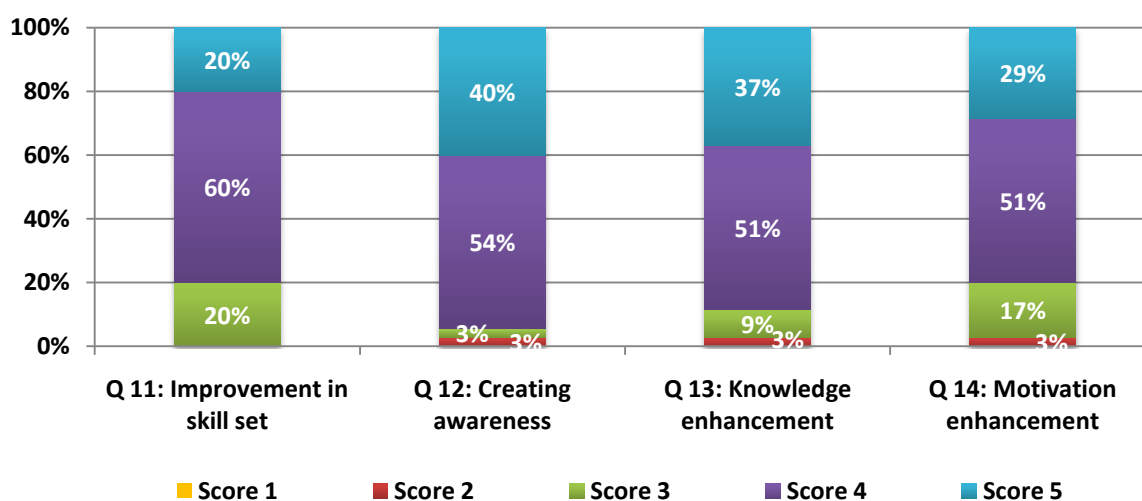
b. **_Sub Category: Short to Medium Term Outcomes_**

Q. 15) **How do you rate the contribution of the programmes in helping adoption of the best practices/ state of the art technologies?**

Q. 16) **How do you rate the contribution of the programmes in formulation of regulations/ policies/ orders/ guidelines /approach papers?**

It was observed that 100% and 97% of the respondents have given a score of 3 or above for contribution of Studies in adoption of best practices and contribution of Studies in formulation of

regulations, policies, orders, guidelines, approach papers respectively. This is further supported by the information received during the qualitative discussion that implementation of ideas discussed during one of the programme on international case studies on fuel audit had resulted into policy implementation and thus saving of money for their state. The average score for this sub category is 3.93.

Figure 34: Sub category- Short to medium term outcomes: Scores given by the Respondents
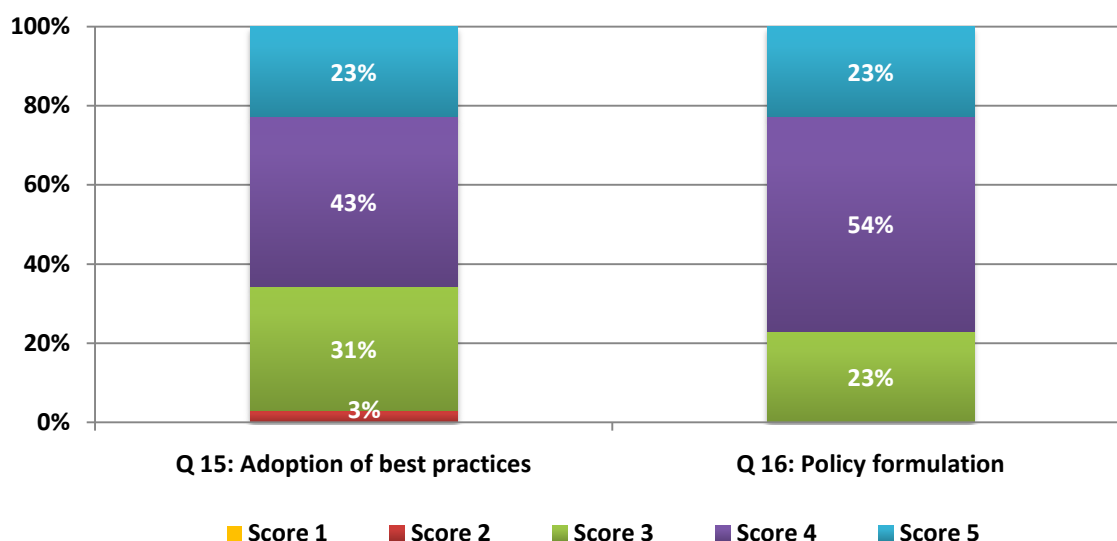
As illustrated in Figure 11 in Chapter 4, the three categories (Input, Output and Outcome) of evaluation framework for CBPs are categorised into five sub categories as follows:

1. Resources (Input)
2. Activities (Output)
3. Participation (Output)
4. Short Term Impact (Outcome)
5. Short/ Medium Term Impact (Outcome)

These sub categories are further classified into parameters. The sub parameters correspond to the questions in the questionnaire and weights are allocated to all the sub parameters. A group of sub parameters constitutes a parameter such that the sum of the weights of the sub parameter indicates the weight of the parameter.

The parameter 'Content and Programme Delivery' has been categorised into sub parameters as shown in the figure below. The average score of these sub parameters from the respondents and the allocated weights are shown in Figure 35 and Figure 36 respectively. Based on the weights allocated to the sub parameters the weighted score of the Parameter is found to be 4.02 out of a maximum possible of 5.

Figure 35: Content and Programme Delivery - Average scores of sub parameters

Bars (Average Score):
- Q2:Effective delivery/pedagogy of the training modules — 4.06
- Q3:Adequacy of the duration of the programmes — 3.91
- Q4:Comprehensive coverage of intended topics — 4.03
- Q5:Presentation of the case studies and analytical examples — 3.83
- Q6:Adequacy of the available infrastructure and facilities — 4.37
- Q7:Quality of the training materials — 4.03
- Q8:Coverage of national/international practices/ state of the art technologies in the power sector — 3.89

Figure 36: Content and Programme Delivery - Weights assigned to sub parameters

Bars (Assigned Weights):
- Q2:Effective delivery/pedagogy of the training modules — 8%
- Q3:Adequacy of the duration of the programmes — 7%
- Q4:Comprehensive coverage of intended topics — 7%
- Q5:Presentation of the case studies and analytical examples — 7%
- Q6:Adequacy of the available infrastructure and facilities — 7%
- Q7:Quality of the training materials — 7%
- Q8:Coverage of national/international practices/ state of the art technologies in the power sector — 7%

CBPs conducted by Secretariat of FOR have proved to be useful as the ERCs are facing a challenge of lack of skilled manpower. The CBPs are even more important for the newly established commissions in India. The feedback received from the participants of CBPs provides the way forward to Secretariat of FOR to conduct the future CBPs. It is observed from the average scores given by the participants to the different sub parameters of CBPs that participants have appreciated the different aspects of the CBPs. As observed from the feedback given by the participants, CBPs conducted by Secretariat of FOR have helped the participants in providing information about their role as a regulator. The programmes were found to be informative. The visits conducted during the programmes (for ex: visits to Solar plants, IEX, NRLDC and meeting with CPUC Commission etc.) are also appreciated by the participants.

Based on the responses received during the survey it was observed that the weighted average scores (out of 5) for the 'Activities' and 'Short term outcomes' sub categories is more than the total impact score. The weighted average score, median and average scores for each sub category are represented in the graphs given below:

Figure 37: Capacity Building Programmes - Weighted Average Scores under different sub categories and Total Impact score (on a scale of 5)
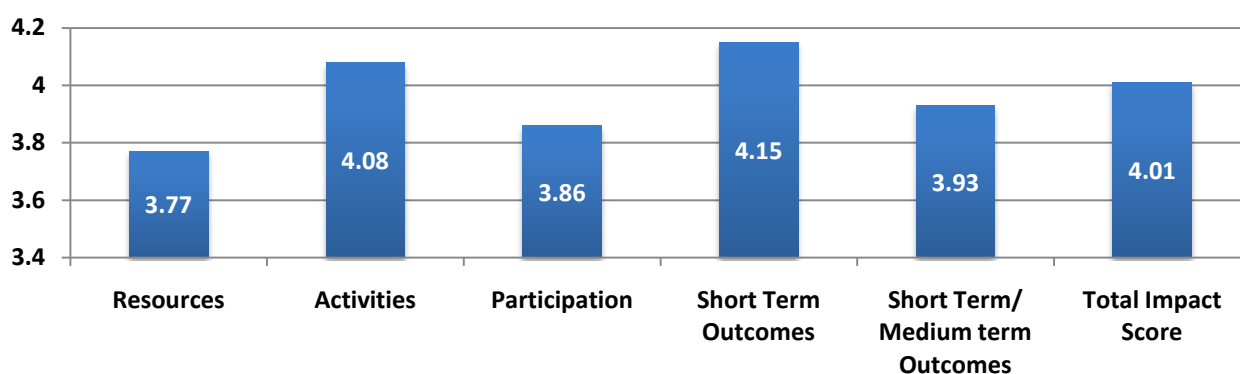
Figure 38: Capacity Building Programmes: Average Scores and Median Scores under different sub categories (on a scale of 5)
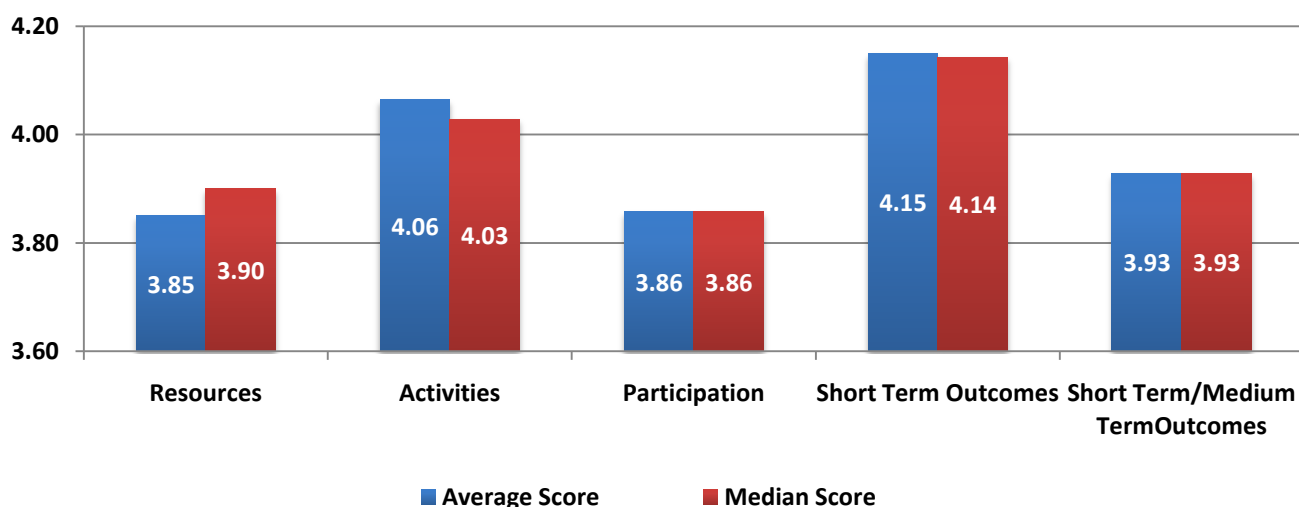
It was observed that 50% of the sub parameters have weighted score less than total impact score of CBPs and weighted score of remaining 50% of the sub parameters is more than total impact score of CBPs. Weighted scores of the sub parameters are shown in the table given below:

Table 24: Classification of sub parameters of CBPs based on the total impact score of 4.01 out of a maximum of 5

Sub parameters- Weighted score is less than total impact score	Score	Sub parameters- Weighted score is more than total impact score	Score
Adequate allocation of financial resources	3.40	Comprehensive coverage of intended topics	4.03
Appropriate participation of number of participants	3.69	Quality of the training materials	4.03
Adequate allocation of human resources	3.80	Quality of the class discussion	4.03
Presentation of the case studies and analytical examples	3.83	Effective delivery/pedagogy of the training modules	4.06
Contribution of the CBPs in adoption of the best practices/ state of the art technologies	3.89	Contribution of the CBPs in enhancing motivation	4.06
Coverage of national/international practices/ state of the art technologies in the power sector	3.89	Relevant Expertise/Experience of partners	4.20
Adequacy of the duration of the programmes	3.91	Contribution of the CBPs in enhancing knowledge	4.23
Performance of partners in conducting CBPs	4.00	Contribution of the CBPs in creating awareness	4.31
Contribution of the CBPs in improvement in the skill set	4.00	Adequacy of the available infrastructure and facilities	4.37

Sub parameters- Weighted score is less than total impact score	Score	Sub parameters- Weighted score is more than total impact score	Score
Contribution of the Studies in formulation of regulations/ policies/ orders/ guidelines /approach papers	**4.00**	Relevance of selected topics	**4.40**

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The table given below represents the categories, sub categories, parameters and sub parameters for the CBPs. It also indicates the weight assigned to each sub parameter and the average score of sub parameter based on the responses collected during the survey.

Table 25: Weights and average score of each sub parameter for the CBPs

Q. No.	Sub category	Parameter	Sub Parameter	Weight	Weighted average Score
INPUT CATEGORY					
Q A	Resources	Financial Resources	Adequate allocation of financial resources	5.0%	3.40
Q B	Resources	Human Resources	Adequate allocation of human resources	5.0%	3.80
Q C	Resources	Partners	Relevant Expertise/Experience of partners	2.5%	4.20
Q D	Resources	Partners	Performance of partners in conducting CBPs	2.5%	4.00
Sub Total				15.0%	3.77
OUTPUT CATEGORY					
Q1	Activities	Topic Selection	Relevance of selected topics	10.0%	4.40
Q2	Activities	Content and Program delivery	Effective delivery/pedagogy of the training modules	8.0%	4.06
Q3	Activities	Content and Program delivery	Adequacy of the duration of the programmes	7.0%	3.91
Q4	Activities	Content and Program delivery	Comprehensive coverage of intended topics	7.0%	4.03
Q5	Activities	Content and Program delivery	Presentation of the case studies and analytical examples	7.0%	3.83
Q6	Activities	Content and Program delivery	Adequacy of the available infrastructure and facilities	7.0%	4.37
Q7	Activities	Content and Program delivery	Quality of the training materials	7.0%	4.03
Q8	Activities	Content and Program delivery	Coverage of national/international practices/ state of the art technologies in the power sector	7.0%	3.89
Q9	Participation	Number of participants	Appropriate participation of number of participants	5.0%	3.69
Q10	Participation	Quality of class discussion	Quality of the class discussion	5.0%	4.03
Sub Total				70.0%	4.05
OUTCOME CATEGORY					

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Q. No.	Sub category	Parameter	Sub Parameter	Weight	Weighted average Score
Q11	Short Term	Improvement in skills	Contribution of the CBPs in improvement in the skill set	2.5%	4.00
Q12	Short Term	Creating Awareness	Contribution of the CBPs in creating awareness	2.5%	4.31
Q13	Short Term	Knowledge Enhancement	Contribution of the CBPs in enhancing knowledge	2.5%	4.23
Q14	Short Term	Enhancing motivation	Contribution of the CBPs in enhancing motivation	2.5%	4.06
Q15	Short Term/Medium Term	Adoption of Best practices	Contribution of the CBPs in adoption of the best practices/ state of the art technologies	2.5%	3.86
Q16	Short Term/Medium Term	Policy formulation	Contribution of the Studies in formulation of regulations/ policies/ orders/ guidelines /approach papers?	2.5%	4.00
Sub Total				**15.0%**	**4.08**
IMPACT SCORE OF CBPs→ 4.01					

Finally, a **total impact score of CBPs is calculated to be 4.01 out of a maximum possible score of 5.** This result shows a high level of satisfaction about the programmes conducted by the Secretariat of Forum of regulators.

Figure 39: Evaluation Framework for Impact Assessment of Capacity Building Programmes (CBPs
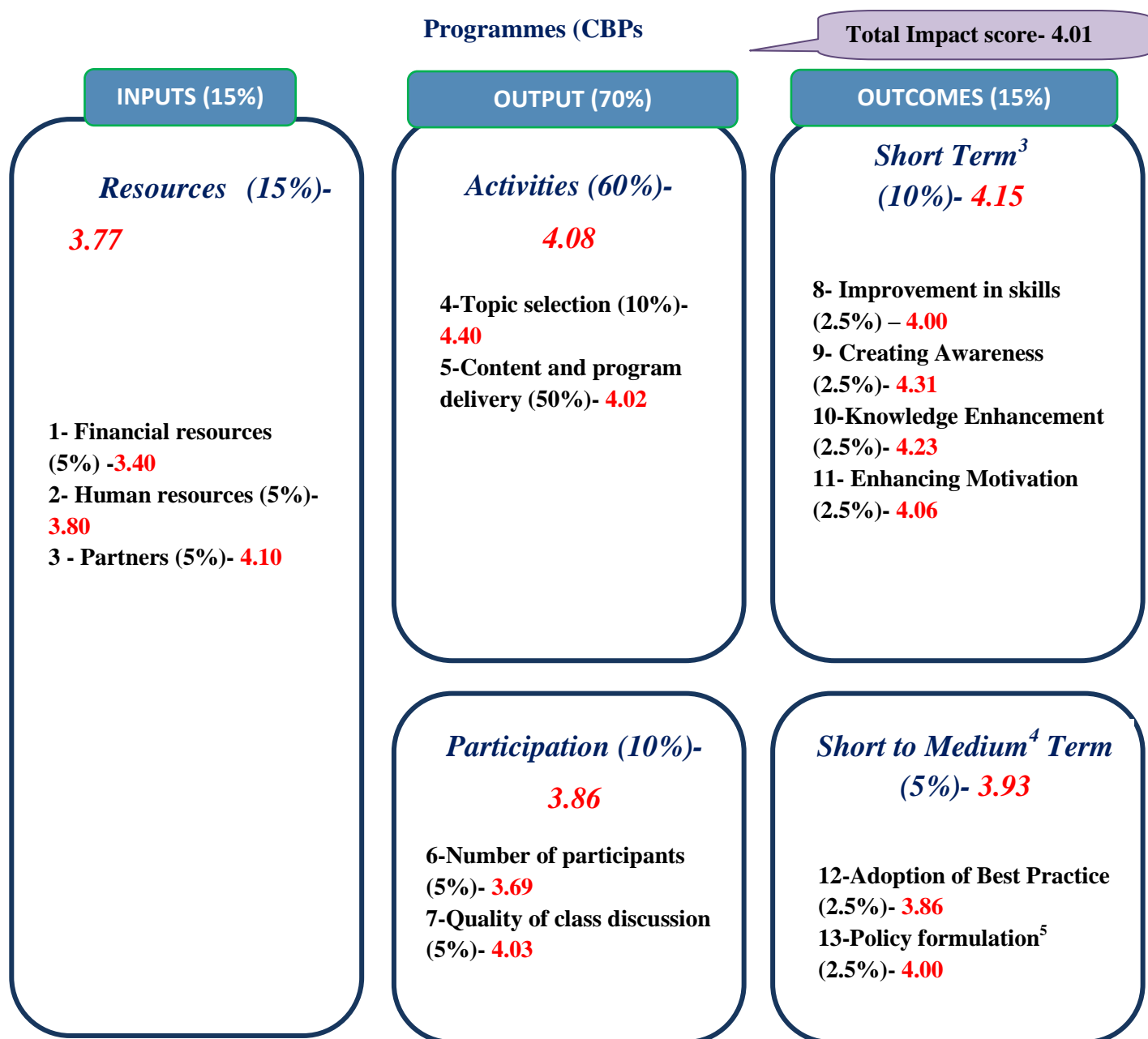
Total Impact score- 4.01

INPUTS (15%)

Resources (15%)- 3.77

1- Financial resources (5%) -3.40
2- Human resources (5%)- 3.80
3 - Partners (5%)- 4.10

OUTPUT (70%)

Activities (60%)- 4.08

4-Topic selection (10%)- 4.40
5-Content and program delivery (50%)- 4.02

Participation (10%)- 3.86

6-Number of participants (5%)- 3.69
7-Quality of class discussion (5%)- 4.03

OUTCOMES (15%)

Short Term[3] (10%)- 4.15

8- Improvement in skills (2.5%) – 4.00
9- Creating Awareness (2.5%)- 4.31
10-Knowledge Enhancement (2.5%)- 4.23
11- Enhancing Motivation (2.5%)- 4.06

Short to Medium[4] Term (5%)- 3.93

12-Adoption of Best Practice (2.5%)- 3.86
13-Policy formulation[5] (2.5%)- 4.00

Note:

1. Values in parentheses in black colour indicate the weights of the parameter/sub-category/category.
2. Values in red colour indicate the average scores of the parameter/sub-category/category.
3. Short term indicates a period less than 6 months from the date of conclusion of the programme.
4. Medium term indicates a period from 6 months to 3 years from the date of conclusion of the programme.
5. Policy formulation covers formulation of regulations/ policies/ orders/ guidelines/ approach papers.

Annexure 1- Questionnaire for Studies and CBPs for Secretariat of FOR

Survey for collection of information for impact assessment of Studies and Capacity Building Programmes carried out by FOR during the 11th plan period (FY 2007-08 to FY 2011-12)

Details of the respondent

First Name: _____ Middle Name: _____ Last Name: _____

Designation: _____

Organization: _____

Landline number: _____MobileNo:_____

Email ID: _____

Part (a): Impact Assessment of Studies conducted by FOR during the 11th plan period

Please provide the ratings for the different aspects of the Studies on a scale of 1 to 5 where a score of 1 indicates least satisfied and a score of 5 indicates most satisfied. Please provide your response by ticking on the appropriate score for each question.

Questions:

1. How do you rate the adequacy of the allocation of the financial resources for the Studies?

    | 1 | 2 | 3 | 4 | 5 |

2. How do you rate the adequacy of the allocation of human resources from the Secretariat of FOR in overall management of the Studies?

    | 1 | 2 | 3 | 4 | 5 |

3. How do you rate the relevant expertise of the partner for the Studies?

    | 1 | 2 | 3 | 4 | 5 |

4. How do you rate the partners' deliverables in terms of coverage of the terms of reference for the Studies?

    | 1 | 2 | 3 | 4 | 5 |

Part (b): Impact Assessment of Capacity Building Programmes conducted by FOR during the 11ᵗʰ plan period

Please provide the ratings for the different aspects of the Capacity Building Programmes on a scale of 1 to 5 where a score of 1 indicates least satisfied and a score of 5 indicates most satisfied. Please provide your response by ticking on the appropriate score for each question.

Questions:

1. How do you rate the adequacy of the allocation of the financial resources for the Capacity Building Programmes?

   | 1 | 2 | 3 | 4 | 5 |

2. How do you rate the adequacy of the allocation of human resources from the Secretariat of FOR in overall management of the Capacity Building Programmes?

   | 1 | 2 | 3 | 4 | 5 |

3. How do you rate the experience/expertise of the partner relevant to the Programmes?

   | 1 | 2 | 3 | 4 | 5 |

4. How do you rate the performance of partner in conducting Capacity Building Programmes as per the agenda of the Programmes?

   | 1 | 2 | 3 | 4 | 5 |

Date _____

Signature of the respondent_____

Annexure 2- Questionnaire for Studies and CBPs for Electricity Regulatory Commissions

Survey for collection of information for impact assessment of Studies and Capacity Building Programmes carried out by FOR during the 11th plan period (FY 2007-08 to FY 2011-12)

Details of the respondent

First Name: _____ Middle Name: _____ Last Name: _____

Designation: _____

Organization: _____

Landline number: _____ MobileNo:_____

Email ID: _____

Part (a): Impact Assessment of Studies conducted by FOR during the 11th plan period

Please provide the ratings for the different aspects of the Studies on a scale of 1 to 5 where a score of 1 indicates least satisfied and a score of 5 indicates most satisfied. Please provide your response by ticking on the appropriate score for each question.

Questions:

1. How do you rate the selected topics for Studies in terms of relevance to the Electricity Regulatory Commission (ERCs)?

    | 1 | | 2 | | 3 | | 4 | | 5 |

2. How do you rate the Studies' objectives in terms of clarity, focus and relevance to the ERCs?

    | 1 | | 2 | | 3 | | 4 | | 5 |

3. How do you rate the scope of the Studies in terms of comprehensive coverage of intended aspects of the selected topic?

    | 1 | | 2 | | 3 | | 4 | | 5 |

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4. How do you rate the structure of the reports in terms of understandability and sequence of the topics?

| 1 | 2 | 3 | 4 | 5 |

5. How do you rate the reports in terms of approach and methodology adopted?

| 1 | 2 | 3 | 4 | 5 |

6. How do you rate the reports in terms of coverage of any of the following: case studies /analytical examples / national/international practices/ state of the art technologies?

| 1 | 2 | 3 | 4 | 5 |

7. How do you rate the quality of the reports in terms of in-depth analysis?

| 1 | 2 | 3 | 4 | 5 |

8. How do you rate the reports in terms of presentation, clarity and coherence?

| 1 | 2 | 3 | 4 | 5 |

9. How do you rate the reports in terms of being an actionable document?

| 1 | 2 | 3 | 4 | 5 |

10. How do you rate the adequacy of the participation of ERCs?

| 1 | 2 | 3 | 4 | 5 |

11. How do you rate the contribution of the Studies in creating awareness about the subjects?

| 1 | 2 | 3 | 4 | 5 |

12. How do you rate the contribution of the Studies in enhancing the knowledge of the subjects?

| 1 | 2 | 3 | 4 | 5 |

13. How do you rate the study reports in helping adoption of best practices/ state of the art technologies?

| 1 | 2 | 3 | 4 | 5 |

14. How do you rate the contribution of the Studies in formulation of regulations/ policies/ orders/ guidelines / approach papers?

| 1 | 2 | 3 | 4 | 5 |

15. How do you rate the likely contribution of the Studies in terms of protection of consumer interest?

| 1 | 2 | 3 | 4 | 5 |

16. How do you rate the likely contribution of the Studies in improving the financial viability of the Power Sector?

| 1 | 2 | 3 | 4 | 5 |

17. How do you rate the likely contribution of the Studies in the rationalization of the tariff?

| 1 | 2 | 3 | 4 | 5 |

18. How do you rate the likely positive impact of the studies on the environment?

| 1 | 2 | 3 | 4 | 5 |

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Part (b): Impact Assessment of Capacity Building Programmes conducted by FOR during the 11th plan period

Please provide the ratings for the different aspects of the Capacity Building Programmes on a scale of 1 to 5 where a score of 1 indicates least satisfied and a score of 5 indicates most satisfied. Please provide your response by ticking on the appropriate score for each question.

Questions:

1. How do you rate the selected topics for Capacity Building Programmes in terms of relevance to functioning of the ERCs?

   | 1 | | 2 | | 3 | | 4 | | 5 |

2. How do you rate the trainers/ faculty in effective delivery/pedagogy of the training modules?

   | 1 | | 2 | | 3 | | 4 | | 5 |

3. How do you rate the adequacy of the duration of the programmes for covering the various aspects related to the selected topic?

   | 1 | | 2 | | 3 | | 4 | | 5 |

4. How do you rate the quality of the programmes in terms of comprehensive coverage of intended topics?

   | 1 | | 2 | | 3 | | 4 | | 5 |

5. How do you rate the quality of the programmes in terms of presenting the case studies and analytical examples?

   | 1 | | 2 | | 3 | | 4 | | 5 |

6. How do you rate the adequacy of the infrastructure and facilities available for the training progammes?

   | 1 | | 2 | | 3 | | 4 | | 5 |

7. How do you rate the quality of the training materials provided?

| 1 | 2 | 3 | 4 | 5 |

8. How do you rate the quality of the training content in terms of covering any of the following aspects: national/international practices/ state of the art technologies in the power sector?

| 1 | 2 | 3 | 4 | 5 |

9. How do you rate the appropriateness of number of participants invited from your Commission for the programmes?

| 1 | 2 | 3 | 4 | 5 |

10. How do you rate the quality of the class discussion in the programmes?

| 1 | 2 | 3 | 4 | 5 |

11. How do you rate the improvement in the skill set of participant after the programmes?

| 1 | 2 | 3 | 4 | 5 |

12. How do you rate the contribution of the programmes in creating awareness about the subject in the participant?

| 1 | 2 | 3 | 4 | 5 |

13. How do you rate the contribution of the programmes in enhancing the knowledge of the subject among the participants?

| 1 | 2 | 3 | 4 | 5 |

14. How do you rate the contribution of the programmes in enhancing the motivation level and propensity to take initiatives?

| 1 | 2 | 3 | 4 | 5 |

15. How do you rate the contribution of the programmes in helping adoption of the best practices/ state of the art technologies?

| 1 | 2 | 3 | 4 | 5 |

16. How do you rate the contribution of the programmes in formulation of regulations/ policies/ orders/ guidelines /approach papers?

1		2		3		4		5

Date _____

Signature of the respondent_____

Annexure 3: Evaluation Framework of Impact Assessment of Studies and CBPs across Chairpersons/ Members/ Officers levels

Total Impact score- 3.88

Figure 40: Evaluation framework for Studies -Responses by Chairpersons or Members[*]

INPUTS (10%)	OUTPUT (70%)	OUTCOMES (20%)

INPUTS (10%)

Resources (10%)

1- Financial resources (2.5%)
2- Human resources (2.5%)
3 - Partners (5%)

OUTPUT (70%)

Activities (65%)- 3.95

4-Topic selection (10%)- 4.37
5-Objective definition (5%)- 4.00
6-Scope of the study (5%)- 4.00
7-Report Structure (5%)- 4.00
8-Content (40%)- 3.84

Participation (5%)- 3.68

9-Involvement of the stakeholders (5%)- 3.68

OUTCOMES (20%)

Short Term[2] (7.5%)- 3.97

10-Creating Awareness (2.5%)- 3.95
11-Knowledge enhancement (5%)- 4.00

Short to Medium[3] Term (5%)- 3.66

12-Adoption of Best Practice (2.5%)- 3.58
13-Policy formulation[5] (2.5%)- 3.74

Long[4] Term (7.5%)- 3.76

14-Impact on consumer interest (2.5%)- 3.95
15-Economic impact (2.5%)- 3.63
16-Environmental impact (2.5%)- 3.84

Note: 1. Values in parentheses in black colour indicate the weights of the parameter/sub-category/category.
2. Values in red colour indicate the average scores of the parameter/sub-category/category.
3. Short term indicates a period less than 6 months from the date of publishing of the Study reports.
4. Medium term indicates a period from 6 months to 3 years from the date of publishing of the Study reports.
5. Long term indicates a period more than 3 years from the date of publishing of the Study reports.
6. Policy formulation covers formulation of regulations/ policies/ orders/ guidelines/ approach papers.

[*] Response for the input parameters is intended only for Secretariat of FOR and response at Chairperson or Member level is not received. Scores given by Officers of secretariat of FOR has been considered as score of Input category in order to arrive at a total impact score.

Figure 41: Studies - Responses by Officers of ERCs

Total Impact score- 3.94

INPUTS (10%)	OUTPUT (70%)	OUTCOMES (20%)

Resources (10%)- 3.50

1- Financial resources (2.5%) -3.50
2- Human resources (2.5%)-3.25
3 - Partners (5%)- 3.63

Activities (65%)- 4.01

4-Topic selection (10%)- 4.45
5-Objective definition (5%)- 4.32
6-Scope of the study (5%)- 4.05
7-Report Structure (5%)- 4.09
8-Content (40%)- 3.83

Participation (5%)- 3.82

9-Involvement of the stakeholders (5%)- 3.82

Short Term[2] (7.5%)- 4.23

10-Creating Awareness (2.5%) -4.14
11-Knowledge enhancement (5%)- 4.32

Short to Medium[3] Term (5%)- 3.75

12-Adoption of Best Practice (2.5%)- 3.73
13-Policy formulation[5] (2.5%)- 3.77

Long[4] Term (7.5%)- 3.83

14-Impact on consumer interest (2.5%)- 3.91
15-Economic impact (2.5%)- 3.75
16-Environmental impact (2.5%)- 3.91

Note: 1. Values in parentheses in black colour indicate the weights of the parameter/sub-category/category.
2. Values in red colour indicate the average scores of the parameter/sub-category/category.
3. Short term indicates a period less than 6 months from the date of publishing of the Study reports.
4. Medium term indicates a period from 6 months to 3 years from the date of publishing of the Study reports.
5. Long term indicates a period more than 3 years from the date of publishing of the Study reports.
6. Policy formulation covers formulation of regulations/ policies/ orders/ guidelines/ approach papers.

Figure 42: Capacity Building Programmes (CBPs) - Chairpersons or Members of ERCs

s *

| Total Impact score- 3.88* |

INPUTS (15%)	OUTPUT (70%)	OUTCOMES (15%)

Resources (15%)

Activities (60%)- 3.88

Short Term[3] (10%)- 3.98

1- Financial resources (5%)
2- Human resources (5%)
3 - Partners (5%)

4-Topic selection (10%)- 4.13
5-Content and program delivery (50%)- 3.85

8- Improvement in skills (2.5%) – 3.93
9- Creating Awareness (2.5%)- 4.13
10-Knowledge Enhancement (2.5%)- 4.00
11- Enhancing Motivation (2.5%)- 3.87

Participation (10%)- 3.77

Short to Medium[4] Term (5%)- 3.97

6-Number of participants (5%)- 3.47
7-Quality of class discussion (5%)- 4.07

12-Adoption of Best Practice (2.5%)- 3.93
13-Policy formulation[5] (2.5%)- 4.00

Note:

1. Values in parentheses in black colour indicate the weights of the parameter/sub-category/category.
2. Values in red colour indicate the average scores of the parameter/sub-category/category.
3. Short term indicates a period less than 6 months from the date of conclusion of the programme.
4. Medium term indicates a period from 6 months to 3 years from the date of conclusion of the programme.
5. Policy formulation covers formulation of regulations/ policies/ orders/ guidelines/ approach papers.

* Response for the input parameters is intended only for Secretariat of FOR and response at Chairperson or Member level is not received. Scores given by Officers of secretariat of FOR has been considered as score of Input category in order to arrive at a total impact score.

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Total Impact score- 4.13

INPUTS (15%)	OUTPUT (70%)	OUTCOMES (15%)

Resources (15%)- 3.85

Activities (60%)- 4.22

Short Term[3] (10%)- 4.30

4-Topic selection (10%)- 4.63
5-Content and program delivery (50%)- 4.16

8- Improvement in skills (2.5%) - 4.11
9- Creating Awareness (2.5%)- 4.47
10-Knowledge Enhancement (2.5%) – 4.42
11- Enhancing Motivation (2.5%)- 4.21

1- Financial resources (5%) -3.40
2- Human resources (5%) -3.80
3 - Partners (5%)- 4.10

Participation (10%)- 3.95

Short to Medium[4] Term (5%)- 3.92

6-Number of participants (5%)- 3.89
7-Quality of class discussion (5%)- 4.00

12-Adoption of Best Practice (2.5%)- 3.84
13-Policy formulation[5] (2.5%)- 4.00

Note:

1. Values in parentheses in black colour indicate the weights of the parameter/sub-category/category.
2. Values in parentheses in red colour indicate the average scores of the parameter/sub-category/category.
3. Short term indicates a period less than 6 months from the date of conclusion of the programme.
4. Medium term indicates a period from 6 months to 3 years from the date of conclusion of the programme.
5. Policy formulation covers formulation of regulations/ policies/ orders/ guidelines/ approach papers.

Annexure 4: Evaluation Framework of Impact Assessment of Studies and CBPs across small or large states

Figure 44: Studies – Responses from small states7**

Total Impact score- 3.95

INPUTS* (10%)

Resources (10%)- 3.50

1- Financial resources (2.5%)- **3.50**
2- Human resources (2.5%)- **3.25**
3 - Partners (5%)- **3.63**

OUTPUT (70%)

Activities (65%)- 4.04

4-Topic selection (10%)- **4.25**
5-Objective definition (5%)- **4.25**
6-Scope of the study (5%)- **3.92**
7-Report Structure (5%)- **4.17**
8-Content (40%)- **3.95**

Participation (5%)- 3.50

9-Involvement of the stakeholders (5%)- **3.50**

OUTCOMES (20%)

Short Term[2] (7.5%)- 4.25

10-Creating Awareness (2.5%)- **4.17**
11-Knowledge enhancement (5%)- **4.33**

Short to Medium[3] Term (5%)-3.88

12-Adoption of Best Practice (2.5%)- **3.83**
13-Policy formulation[5] (2.5%)- **3.92**

Long[4] Term (7.5%)- 3.81

14-Impact on consumer interest (2.5%)- **4.08**
15-Economic impact (2.5%)- **3.67**
16-Environmental impact (2.5%)- **3.83**

Note: 1. Values in parentheses in black colour indicate the weights of the parameter/sub-category/category.
2. Values in red colour indicate the average scores of the parameter/sub-category/category.
3. Short term indicates a period less than 6 months from the date of publishing of the Study reports.
4. Medium term indicates a period from 6 months to 3 years from the date of publishing of the Study reports.
5. Long term indicates a period more than 3 years from the date of publishing of the Study reports.
6. Policy formulation covers formulation of regulations/ policies/ orders/ guidelines/ approach papers.

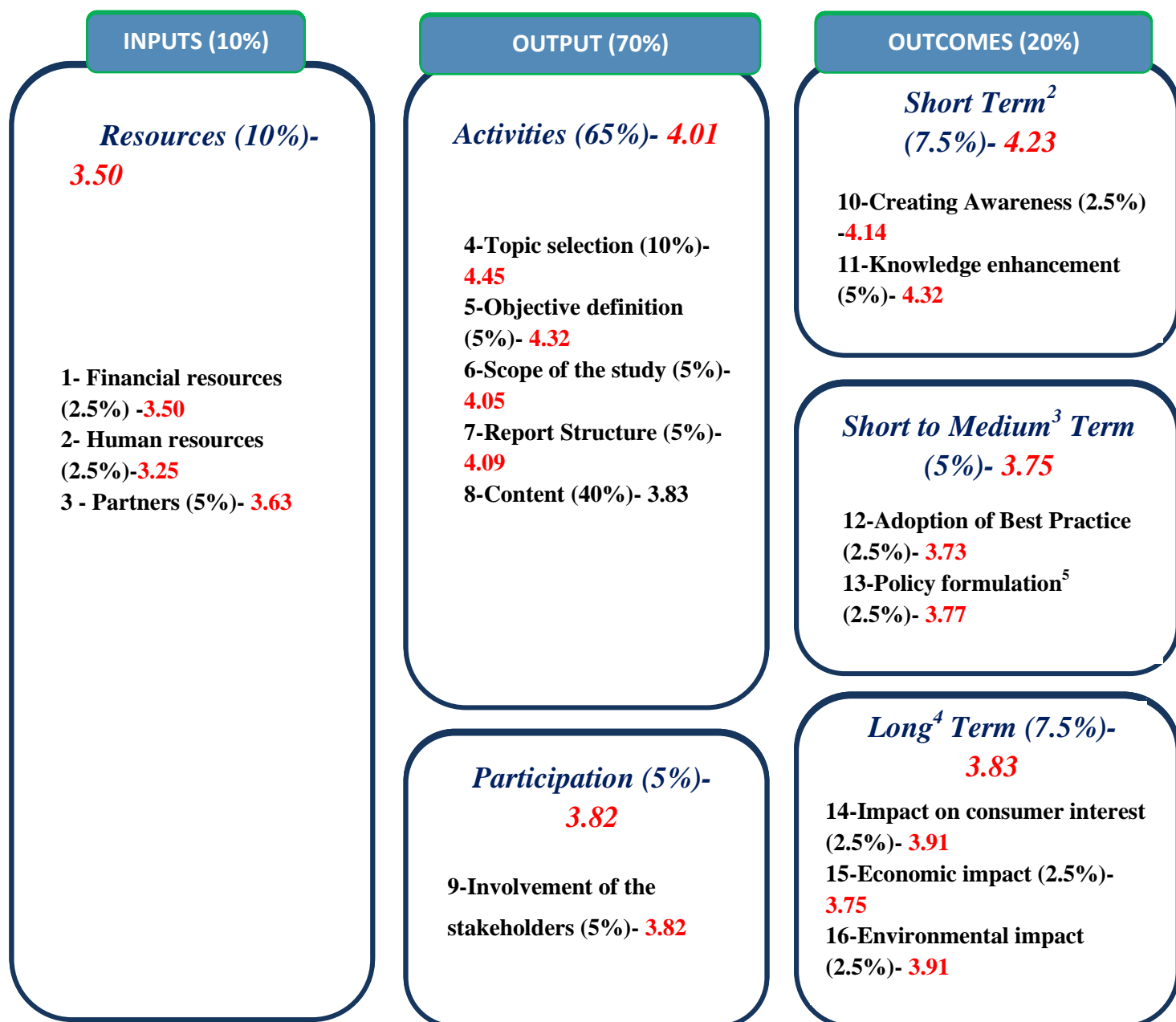*Separate score for the two levels are computed for Output and Outcome categories but the score for the Input category is kept constant where responses are received only from officers from Secretariat of FOR
**ERCs in North Eastern States and Union Territories are categorized under Small States. Other ERCs are categorized under Large States. Responses from FOR (under the Input category) are considered under both Small and Large States.

Figure 45: Studies - Responses from large states[*]

Total Impact score- 3.89

INPUTS* (10%)	OUTPUT (70%)	OUTCOMES (20%)

INPUTS* (10%)

Resources (10%)- 3.50

1- Financial resources (2.5%) -**3.50**
2- Human resources (2.5%)-**3.25**
3 - Partners (5%)- **3.63**

OUTPUT (70%)

*Activities (65%)-**3.96***

4-Topic selection (10%)-**4.48**
5-Objective definition (5%)- **4.14**
6-Scope of the study (5%)- **4.07**
7-Report Structure (5%)-**4.00**
8-Content (40%)- **3.79**

Participation (5%)- 3.86

9-Involvement of the stakeholders (5%)- **3.86**

OUTCOMES (20%)

*Short Term[2] (7.5%)-**4.05***

10-Creating Awareness (2.5%) -**4.00**
11-Knowledge enhancement (5%)-**4.10**

Short to Medium[3] Term (5%)- 3.64

12-Adoption of Best Practice (2.5%) - **3.59**
13-Policy formulation[5] (2.5%)- **3.69**

Long[4] Term (7.5%)- 3.79

14-Impact on consumer interest (2.5%)- **3.86**
15-Economic impact (2.5%)- **3.71**
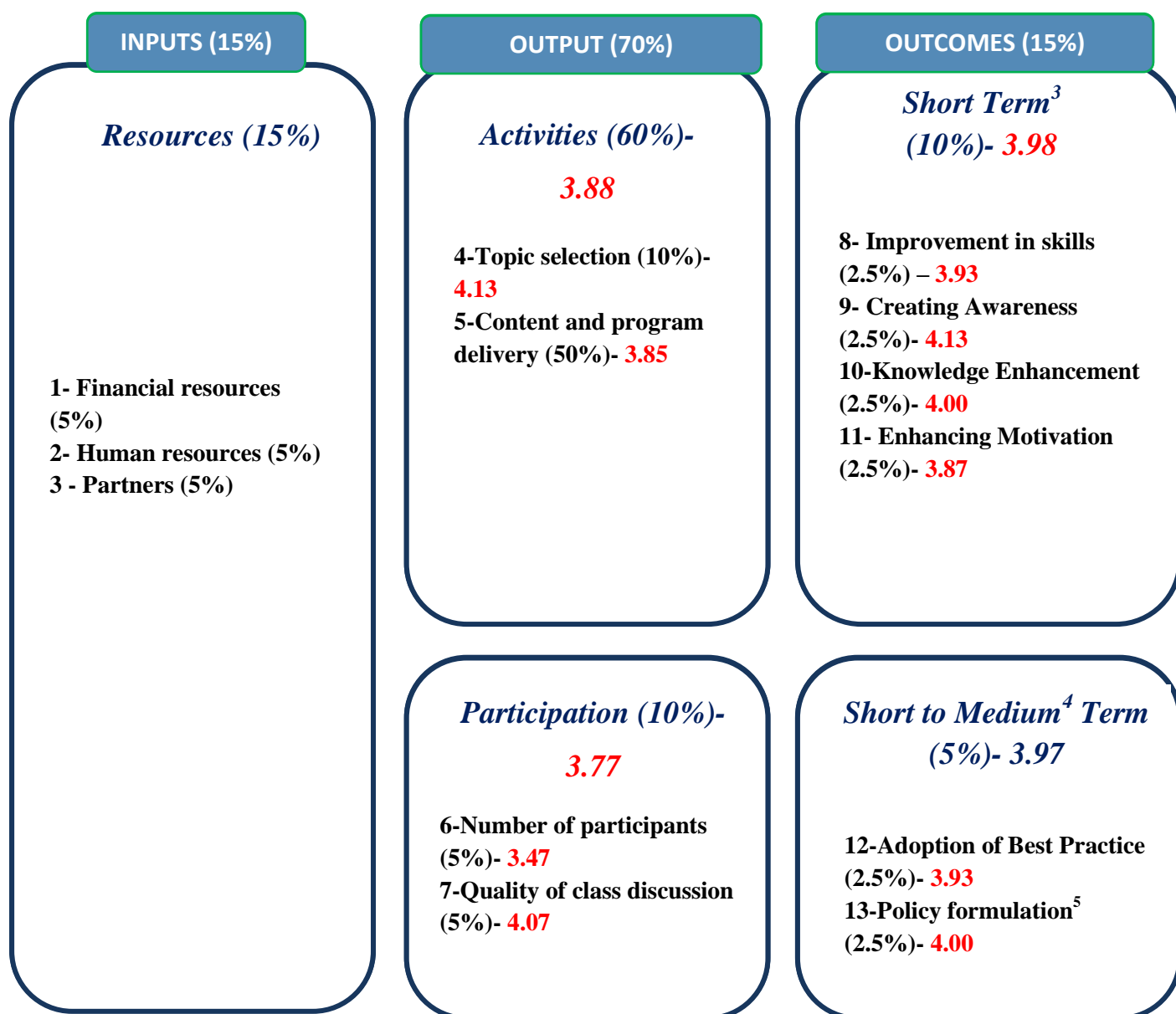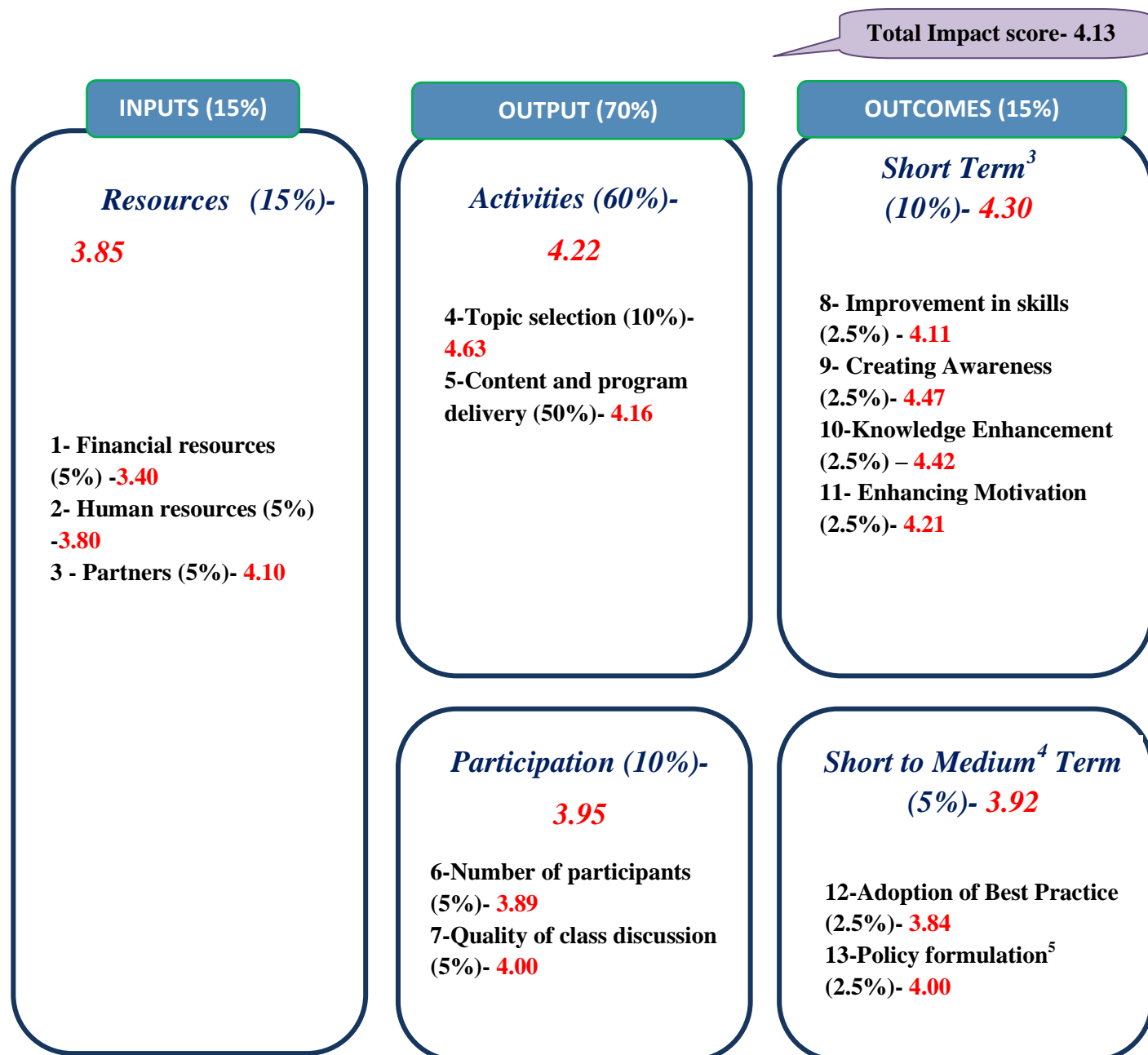16-Environmental impact (2.5%)- **3.90**

Note:
1. Values in parentheses in blue colour indicate the weights of the parameter/sub-category/category.
2. Values in red colour indicate the average scores of the parameter/sub-category/category.
3. Short term indicates a period less than 6 months from the date of publishing of the Study reports.
4. Medium term indicates a period from 6 months to 3 years from the date of publishing of the Study reports.
5. Long term indicates a period more than 3 years from the date of publishing of the Study reports.
6. Policy formulation covers formulation of regulations/ policies/ orders/ guidelines/ approach papers.

*Separate score for the two levels are computed for Output and Outcome categories but the score for the Input category is kept constant where responses are received only from officers from Secretariat of FOR
**ERCs in North Eastern States and Union Territories are categorized under Small States. Other ERCs are categorized under Large States. Responses from FOR (under the Input category) are considered under both Small and Large States.

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Figure 46: Capacity Building Programmes (CBPs) - Responses from small states[**]

Total Impact score- 4.09

INPUTS* (15%)	OUTPUT (70%)	OUTCOMES (15%)

INPUTS* (15%)

Resources (15%)- 3.85

1- Financial resources (5%) - **3.40**
2- Human resources (5%)- **3.80**
3 - Partners (5%)- **4.10**

OUTPUT (70%)

Activities (60%)- 4.11

4-Topic selection (10%)- **4.38**
5-Content and program delivery (50%)- **4.07**

Participation (10%)- 4.19

6-Number of participants (5%)- **4.13**
7-Quality of class discussion (5%)- **4.25**

OUTCOMES (15%)

Short Term[3] (10%)- 4.22

8- Improvement in skills (2.5%) – **4.00**
9- Creating Awareness (2.5%)- **4.38**
10-Knowledge Enhancement (2.5%)- **4.13**
11- Enhancing Motivation (2.5%)- **4.38**

Short to Medium[4] Term (5%)- 4.13

12-Adoption of Best Practice (2.5%)- **4.13**
13-Policy formulation[5] (2.5%)- **4.13**

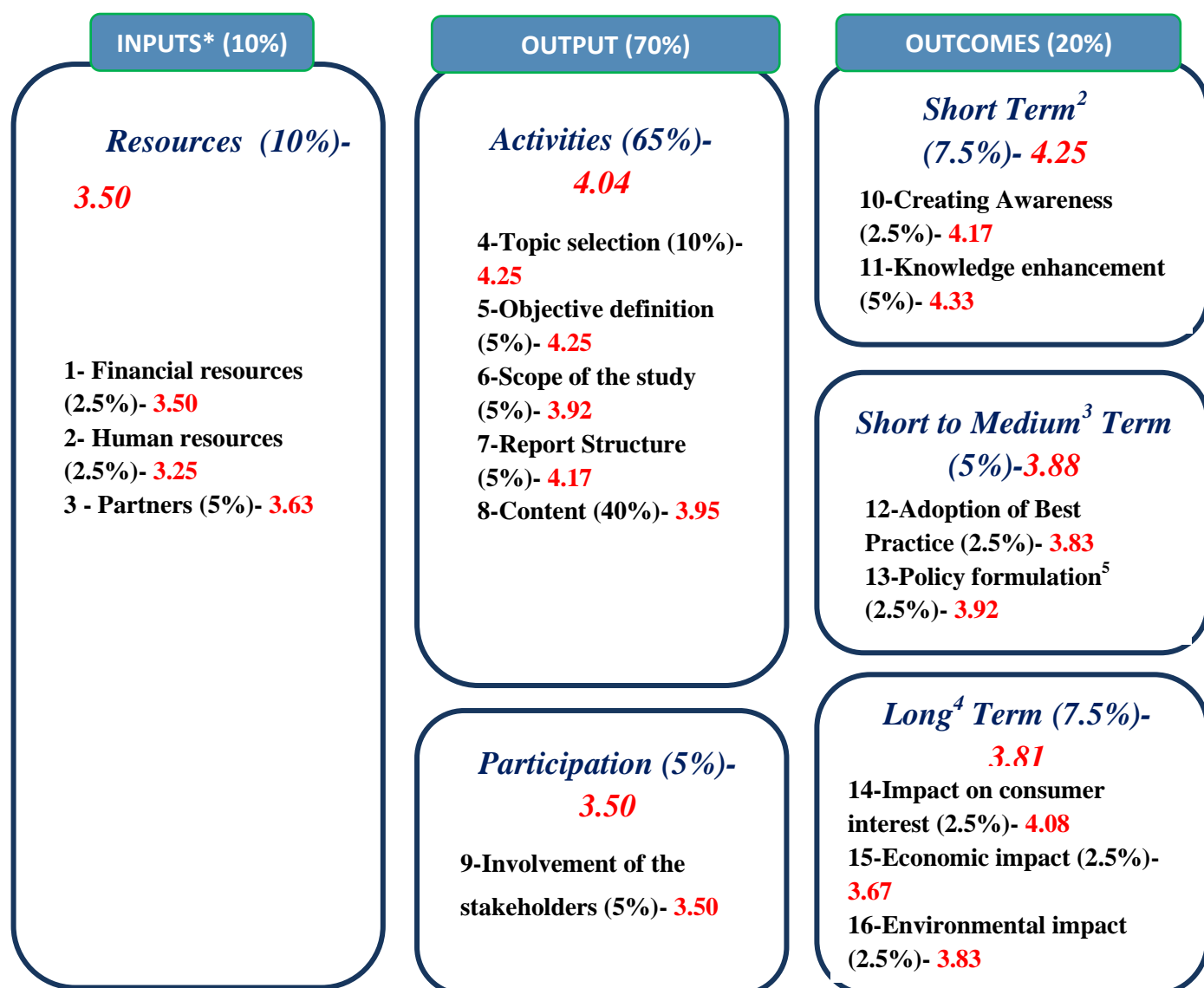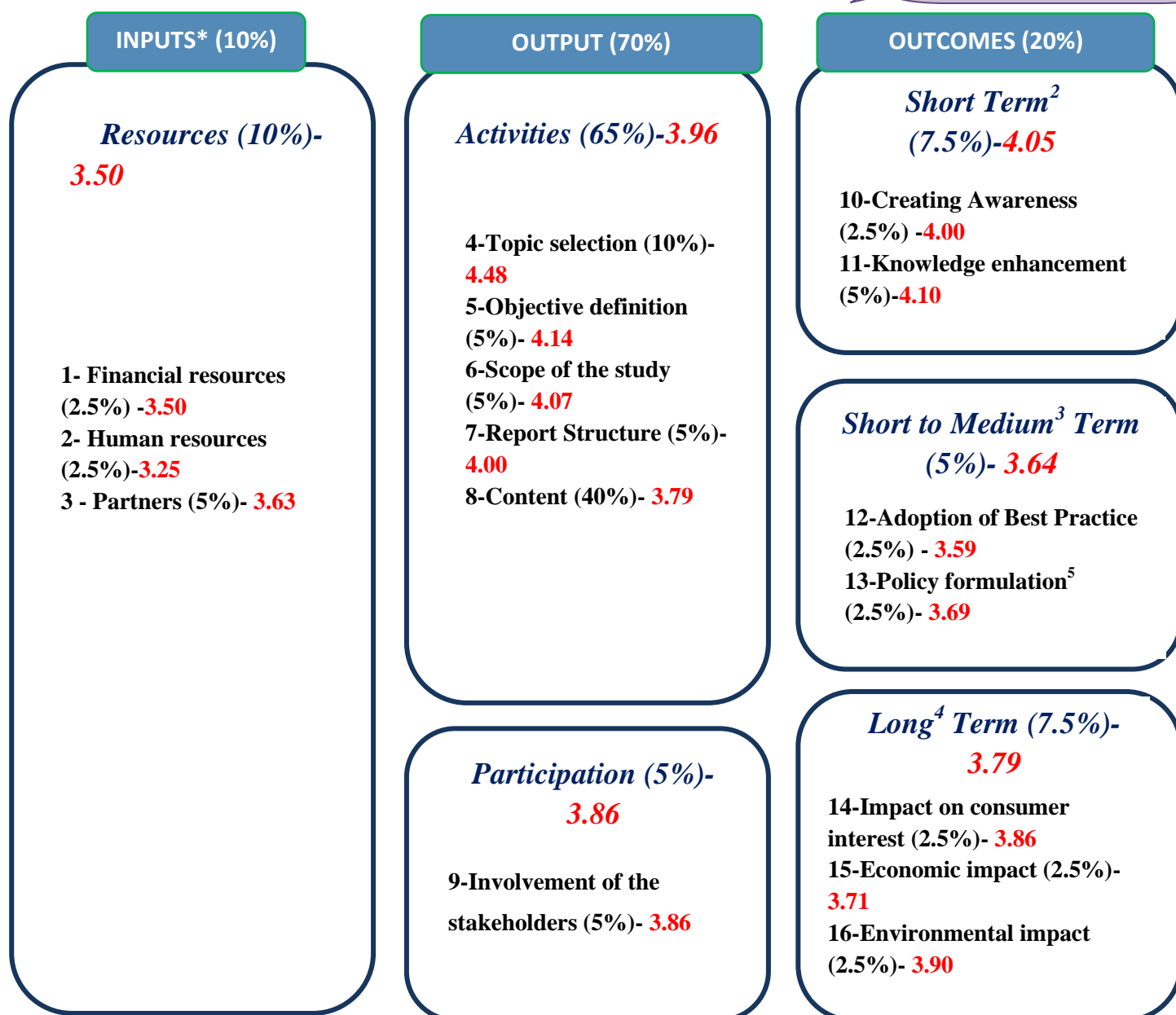**Note:**

1. Values in parentheses in blue colour indicate the weights of the parameter/sub-category/category.
2. Values in red colour indicate the average scores of the parameter/sub-category/category.
3. Short term indicates a period less than 6 months from the date of conclusion of the programme.
4. Medium term indicates a period from 6 months to 3 years from the date of conclusion of the programme.
5. Policy formulation covers formulation of regulations/ policies/ orders/ guidelines/ approach papers.

*Separate score for the two levels are computed for Output and Outcome categories but the score for the Input category is kept constant where responses are received only from officers from Secretariat of FOR
**ERCs in North Eastern States and Union Territories are categorized under Small States. Other ERCs are categorized under Large States. Responses from FOR (under the Input category) are considered under both Small and Large States.

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Figure 47: Capacity Building Programmes (CBPs) - Responses from larger states[*]

Total Impact score- 4.00

INPUTS* (15%)	OUTPUT (70%)	OUTCOMES (15%)

Resources (15%)- 3.85

1- Financial resources (5%) -3.40
2- Human resources (5%) -3.80
3 - Partners (5%)- 4.10

Activities (60%)- 4.06

4-Topic selection (10%)- 4.42
5-Content and program delivery (50%)- 4.01

Short Term[3] (10%)- 4.14

8- Improvement in skills (2.5%) - 4.04
9- Creating Awareness (2.5%)- 4.31
10-Knowledge Enhancement (2.5%) – 4.27
11- Enhancing Motivation (2.5%)- 3.96

Participation (10%)- 3.77

6-Number of participants (5%)- 3.58
7-Quality of class discussion (5%)- 3.96

Short to Medium[4] Term (5%)- 3.88

12-Adoption of Best Practice (2.5%)- 3.81
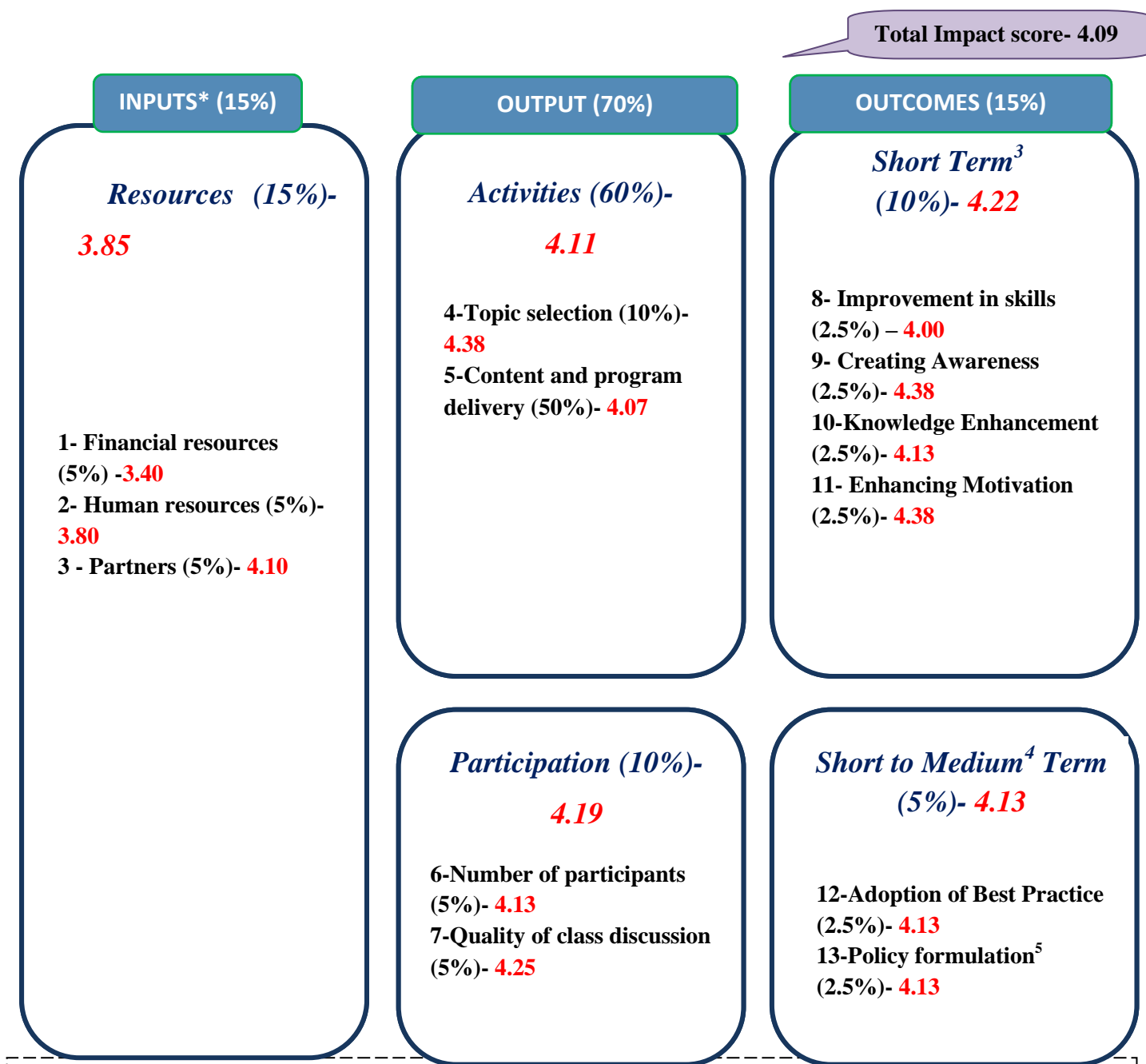13-Policy formulation[5] (2.5%)- 3.96

Note:

1. Values in parentheses in blue colour indicate the weights of the parameter/sub-category/category.
2. Values in red colour indicate the average scores of the parameter/sub-category/category.
3. Short term indicates a period less than 6 months from the date of conclusion of the programme.
4. Medium term indicates a period from 6 months to 3 years from the date of conclusion of the programme.
5. Policy formulation covers formulation of regulations/ policies/ orders/ guidelines/ approach papers.

*Separate score for the two levels are computed for Output and Outcome categories but the score for the Input category is kept constant where responses are received only from officers from Secretariat of FOR

**ERCs in North Eastern States and Union Territories are categorized under Small States. Other ERCs are categorized under Large States. Responses from FOR (under the Input category) are considered under both Small and Large States.

Annexure 5: Region wise comparison of average scores[*]

Table 26: Region wise comparison of average score of Parameters, Sub-category and Category for Studies

	Northern	Western	Southern	Eastern	North-Eastern	JERC-UTs
INPUT						
Financial Resources	3.5	3.5	3.5	3.5	3.5	3.5
Human Resources	3.25	3.25	3.25	3.25	3.25	3.25
Partners	3.63	3.63	3.63	3.63	3.63	3.63
Resources	**3.50**	**3.50**	**3.50**	**3.50**	**3.50**	**3.50**
INPUT	**3.50**	**3.50**	**3.50**	**3.50**	**3.50**	**3.50**
OUTPUT						
Topic Selection	4.50	4.71	4.29	4.33	4.20	4.50
Objective Definition	4.25	4.29	3.86	4.00	4.20	4.50
Scope of the Study	4.25	3.86	4.14	3.67	3.80	4.50
Report Structure	3.92	4.00	4.29	3.67	4.10	4.50
Content	3.83	3.51	4.09	3.53	3.92	4.10
Activities	**4.01**	**3.83**	**4.11**	**3.70**	**3.99**	**4.28**
Involvement of the Stakeholders	3.75	3.57	4.00	4.67	3.30	4.50
Participation	**3.75**	**3.57**	**4.00**	**4.67**	**3.30**	**4.50**
OUTPUT	**3.98**	**3.80**	**4.10**	**3.80**	**3.92**	**4.30**
OUTCOME						
Creating Awareness	3.92	4.14	4.00	4.00	4.00	5.00
Knowledge Enhancement	4.08	4.14	4.29	3.67	4.20	5.00
Short Term	**4.00**	**4.14**	**4.14**	**3.83**	**4.10**	**5.00**
Adoption of Best practices	3.83	3.14	3.57	3.67	3.70	4.50
Policy formulation	3.92	3.57	3.57	3.33	3.90	4.00
Short/ Medium Term	**3.88**	**3.36**	**3.57**	**3.50**	**3.80**	**4.25**
Impact on consumer interest	3.83	3.86	3.86	4.00	4.10	4.00
Economic Impact	3.92	3.29	3.86	3.50	3.50	4.50
Environmental impact	4.00	3.71	3.86	4.00	3.70	4.50
Long term	**3.92**	**3.54**	**3.86**	**3.75**	**3.70**	**4.38**
OUTCOME	**3.93**	**3.64**	**3.86**	**3.71**	**3.83**	**4.50**
Total Impact Score	**3.93**	**3.76**	**4.01**	**3.74**	**3.89**	**4.25**

[*] Response for the input parameters is intended only for Secretariat of FOR. Responses from FOR (under the Input category) are considered under all regions.

Table 27: Region wise comparison of average score of parameters, Sub-category and Category for CBPs

	Northern	Western	Southern	Eastern	North-Eastern	JERC-UTs
INPUT						
Financial Resources	3.40	3.40	3.40	3.40	3.40	3.40
Human Resources	3.80	3.80	3.80	3.80	3.80	3.80
Partners	4.10	4.10	4.10	4.10	4.10	4.10
Resources	**3.85**	**3.85**	**3.85**	**3.85**	**3.85**	**3.85**
INPUT	**3.85**	**3.85**	**3.85**	**3.85**	**3.85**	**3.85**
OUTPUT						
Topic Selection	4.25	4.83	4.43	4.00	4.20	4.67
Content and Program delivery	4.05	3.90	4.12	3.57	4.03	4.14
Activities	**4.07**	**4.02**	**4.16**	**3.63**	**4.05**	**4.21**
Number of participants	3.25	3.67	3.86	4.00	4.20	4.00
Quality of class discussion	4.08	3.67	4.00	4.00	4.40	4.00
Participation	**3.67**	**3.67**	**3.93**	**4.00**	**4.30**	**4.00**
OUTPUT	**3.99**	**3.95**	**4.11**	**3.70**	**4.10**	**4.17**
OUTCOME						
Improvement in skills	3.92	4.33	3.86	4.00	3.80	4.33
Creating Awareness	4.25	4.17	4.43	4.50	4.00	5.00
Knowledge Enhancement	4.17	4.33	4.57	3.50	3.60	5.00
Enhancing motivation	3.92	4.00	4.00	4.00	4.40	4.33
Short Term	**4.06**	**4.21**	**4.21**	**4.00**	**3.95**	**4.67**
Adoption of Best practices	3.83	3.50	3.86	4.00	4.00	4.33
Policy formulation	4.25	3.67	4.00	3.00	3.80	4.67
Short/ Medium Term	**4.04**	**3.58**	**3.93**	**3.50**	**3.90**	**4.50**
OUTCOME	**4.06**	**4.00**	**4.12**	**3.83**	**3.93**	**4.61**
Total Impact Score	**3.99**	**3.97**	**4.08**	**3.74**	**4.03**	**4.20**

Annexure 6: Comparison of average scores* based on power demand

Table 28: Based on Power demand*: Comparison of average score of parameters, Sub-category and Category for Studies

	High power demand states	Medium power demand states	Low power demand states
INPUT			
Financial Resources	3.5	3.5	3.5
Human Resources	3.25	3.25	3.25
Partners	3.63	3.63	3.63
Resources	**3.5**	**3.5**	**3.5**
INPUT	**3.5**	**3.5**	**3.5**
OUTPUT			
Topic Selection	4.44	4.44	4.40
Objective Definition	4.11	4.11	4.40
Scope of the Study	4.11	4.11	4.07
Report Structure	4.00	4.00	4.20
Content	3.88	3.88	3.88
Activities	**3.93**	**3.93**	**4.13**
Involvement of the Stakeholders	3.89	3.89	3.60
Participation	**3.89**	**3.89**	**3.89**
OUTPUT	**3.92**	**3.92**	**4.08**
OUTCOME			
Creating Awareness	3.78	3.78	4.27
Knowledge Enhancement	4.11	4.11	4.40
Short Term	**3.94**	**3.94**	**4.33**
Adoption of Best practices	3.78	3.78	3.93
Policy formulation	3.78	3.78	4.00
Short/ Medium Term	**3.78**	**3.78**	**3.97**
Impact on consumer interest	3.67	3.67	4.13
Economic Impact	3.89	3.89	3.77
Environmental impact	4.00	4.00	3.87
Long term	**3.86**	**3.86**	**3.88**
OUTCOME	**3.86**	**3.86**	**4.02**
Total Impact Score	**3.74**	**3.82**	**3.95**

*Note:
- Large power demand states have power demand of more than 45000 MU
- Medium power demand states have power demand more than 10,000 MU and less than 45000 MU
- Small power demand states have power demand of less than 10,000MU and include JERCs

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* Response for the input parameters is intended only for Secretariat of FOR. Responses from FOR (under the Input category) are considered under all categories of states.

Table 29: Based on Power demand: Comparison of average score of parameters, Sub-category and Category for CBPs

	High power demand states	Medium power demand states	Low power demand states
INPUT			
Financial Resources	3.4	3.4	3.4
Human Resources	3.8	3.8	3.8
Partners	4.1	4.1	4.1
Resources	**3.85**	**3.85**	**3.85**
INPUT	**3.85**	**3.85**	**3.85**
OUTPUT			
Topic Selection	4.50	4.22	4.40
Content and Program delivery	3.92	4.00	4.19
Activities	**3.99**	**4.03**	**4.21**
Number of participants	3.56	3.56	4.00
Quality of class discussion	3.88	4.00	4.30
Participation	**3.72**	**3.78**	**4.15**
OUTPUT	**3.94**	**3.98**	**4.20**
OUTCOME			
Improvement in skills	3.94	4.11	4.00
Creating Awareness	4.25	4.33	4.40
Knowledge Enhancement	4.31	4.00	4.30
Enhancing motivation	3.88	4.11	4.30
Short Term	**4.09**	**4.14**	**4.25**
Adoption of Best practices	3.56	4.00	4.20
Policy formulation	3.94	3.78	4.30
Short/ Medium Term	**3.75**	**3.89**	**4.25**
OUTCOME	**3.98**	**4.06**	**4.25**
Total Impact Score	**3.93**	**3.98**	**4.15**

*Note:
- *Large power demand states have power demand of more than 45000 MU*
- *Medium power demand states have power demand more than 10,000 MU and less than 45000 MU*
- *Small power demand states have power demand of less than 10,000MU and include JERCs*

Annexure 7: List of the Chairpersons/Members/ Officers of ERCs contacted for qualitative discussion

Table 30: List of officers from ERCs with whom qualitative discussions are conducted for Studies

S. No.	Name of the person	State	Name of the commission
1	Rakesh Sahni	Madhya Pradesh	Madhya Pradesh Electricity Regulatory Commission
2	Manish Shrivastava	Madhya Pradesh	Madhya Pradesh Electricity Regulatory Commission
3	Pravinbhai Patel	Gujarat	Gujarat Electricity Regulatory Commission
4	Virinder Singh	Punjab	Punjab Electricity Regulatory Commission
5	Rakesh Kumar	Arunanchal Pradesh	Arunanchal Pradesh Electricity Regulatory Commission
6	Muni Krishnaiah Tirupati	Jharkhand	Jharkhand Electricity Regulatory Commission
7	H. Than Thianga	Manipur & Mizoram	Joint Electricity Regulatory Commission (for the states of Manipur & Mizoram)
8	Nagalsamy Sellappan	Tamil Nadu	Tamil Nadu Electricity Regulatory Commission
9	Mandikal Ramakrishnappa Sreenivasa Murthy	Karnataka	Karnataka Electricity Regulatory Commission
10	Rajasekhar Devaguptapu	Delhi	Delhi Electricity Regulatory Commission
11	Abhishek Moza	Delhi	Delhi Electricity Regulatory Commission
12	Anand Kumar	Meghalaya	Meghalaya Electricity Regulatory Commission
13	Donray Awungshi Shishak	Nagaland	Nagaland Electricity Regulatory Commission
14	Er.Hekavi N Ayemi	Nagaland	Nagaland Electricity Regulatory Commission
15	S K Chaturvedi	Goa and UTs	Joint Electricity Regulatory Commission (for the state of Goa and UTs)

Table 31: List of officers from ERCs with whom qualitative discussions are conducted for CBPs

S No	Name of the person	State	Name of the commission
1	Manish Shrivastava	Madhya Pradesh	Madhya Pradesh Electricity Regulatory Commission
2	Virinder Singh	Punjab	Punjab Electricity Regulatory Commission
3	H. Than Thianga	Manipur & Mizoram	Joint Electricity Regulatory Commission (for the states of Manipur & Mizoram)
4	Rashmi Somasekharan Nair	Tamil Nadu	Tamil Nadu Electricity Regulatory Commission
5	Rajasekhar Devaguptapu	Delhi	Delhi Electricity Regulatory Commission
6	Chandra Shekher Sharma	Uttrakhand	Uttrakhand Electricity Regulatory Commission
7	Ajoy Sahu	Orissa	Orissa Electricity Regulatory Commission
8	Anand Kumar	Meghalaya	Meghalaya Electricity Regulatory Commission
9	S K Chaturvedi	Goa and UTs	Joint Electricity Regulatory Commission (for the state of Goa and UTs)

Case wise Statistics

Case Number	Actual Group	Predicted Group	Highest Group			P(G=g | D=d)	Squared Mahalanobis Distance to Centroid	Second Highest Group		Squared Mahalanobis Distance to Centroid	Discriminant Scores	
			P(D>d | G=g)									
			p	df			Group	P(G=g | D=d)		Function 1	Function 2
Original 1	1	1	.273	2	.919	2.597	2	.081	7.466	-1.933	1.644
2	1	1	.407	2	.895	1.798	2	.105	6.082	-1.872	1.303
3	2	2	.463	2	.654	1.538	1	.346	2.812	-.949	.486
4	1	1	.694	2	.848	.731	2	.152	4.166	-1.946	-.379
5	1	1	.694	2	.848	.731	2	.152	4.166	-1.946	-.379
6	2	2	.463	2	.654	1.538	1	.346	2.812	-.949	.486
7	2	2	.997	2	.962	.005	1	.029	6.994	.027	-.156
8	2	2	.309	2	.807	2.348	1	.193	5.213	-.909	-1.362
9	1	1	.931	2	.989	.143	2	.011	9.136	-2.869	.438
10	2	2	.997	2	.962	.005	1	.029	6.994	.027	-.156
11	1	1	.285	2	.770	2.512	2	.230	4.934	-1.876	-1.236
12	2	2	.997	2	.962	.005	1	.029	6.994	.027	-.156
13	2	2	.463	2	.654	1.538	1	.346	2.812	-.949	.486
14	1	1	.068	2	1.000	5.382	2	.000	25.226	-4.850	.731
15	1	1	.373	2	.999	1.971	2	.001	15.673	-3.866	-.427
16	2	1**	.520	2	.806	1.309	2	.194	4.159	-1.884	-.720
17	1	1	.273	2	.919	2.597	2	.081	7.466	-1.933	1.644
18	1	1	.204	2	.978	3.179	2	.022	10.737	-2.881	-1.585
19	2	2	.984	2	.961	.031	1	.032	6.863	-.027	-.332

20	2	2	.997	2	.962	.005	1	.029	6.994	.027	-.156
21	2	2	.997	2	.962	.005	1	.029	6.994	.027	-.156
22	2	3**	.055	2	.612	5.795	2	.388	6.705	1.986	-1.956
23	3	3	.055	2	.612	5.795	2	.388	6.705	1.986	-1.956
24	3	3	.125	2	.870	4.165	2	.130	7.959	1.959	1.914
25	3	3	.849	2	.987	.326	2	.013	9.065	2.943	.756
26	3	3	.691	2	.999	.740	2	.001	14.781	3.919	.115
27	3	3	.557	2	.990	1.172	2	.010	10.268	2.935	1.273
28	2	3**	.520	2	.776	1.310	2	.224	3.791	1.938	.408
29	2	2	.892	2	.969	.229	1	.024	7.646	.035	-.672
30	2	2	.314	2	.801	2.318	3	.196	5.139	.962	1.050
31	3	3	.632	2	.976	.918	2	.024	8.344	2.922	-.750
32	2	2	.428	2	.794	1.697	3	.204	4.419	1.023	.709
33	2	2	.398	2	.876	1.843	3	.123	5.778	1.064	-1.138
34	3	3	.691	2	.999	.740	2	.001	14.781	3.919	.115
35	3	3	.691	2	.999	.740	2	.001	14.781	3.919	.115

**. Misclassified case

Annexure 9: Case wise statistics for CBPs

Case wise Statistics

Case Number		Actual Group	Predicted Group	Highest Group			Highest Group	Second Highest Group			Discriminant Scores	
				P(D>d | G=g)		P(G=g | D=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g | D=d)	Squared Mahalanobis Distance to Centroid	Function 1	Function 2
				p	df							
Original	1	1	1	.841	2	1.000	.346	2	.000	15.695	-3.095	1.182
	2	2	2	.690	2	.949	.744	1	.031	7.587	-.103	-.128
	3	2	2	.690	2	.949	.744	1	.031	7.587	-.103	-.128
	4	1	1	.504	2	.917	1.370	2	.083	6.183	-1.551	.786
	5	2	2	.108	2	1.000	4.459	1	.000	20.035	-.191	-2.965
	6	2	2	.108	2	1.000	4.459	1	.000	20.035	-.191	-2.965
	7	1	1	.841	2	1.000	.346	2	.000	15.695	-3.095	1.182
	8	1	1	.504	2	.917	1.370	2	.083	6.183	-1.551	.786
	9	2	1**	.504	2	.917	1.370	2	.083	6.183	-1.551	.786
	10	2	2	.690	2	.949	.744	1	.031	7.587	-.103	-.128
	11	1	1	.841	2	1.000	.346	2	.000	15.695	-3.095	1.182
	12	1	1	.122	2	1.000	4.207	2	.000	23.599	-4.537	-.223
	13	1	1	.505	2	.864	1.365	2	.136	5.058	-1.646	.268
	14	2	2	.866	2	.976	.288	1	.018	8.251	-.198	-.646
	15	1	1	.894	2	.999	.225	2	.001	14.454	-3.190	.665
	16	2	3**	.037	2	.566	6.608	2	.434	7.138	2.890	-1.439
	17	2	2	.108	2	1.000	4.459	1	.000	20.035	-.191	-2.965
	18	2	2	.690	2	.949	.744	1	.031	7.587	-.103	-.128
	19	2	2	.470	2	.761	1.511	3	.238	3.833	1.441	-.525
	20	3	2**	.557	2	.918	1.172	3	.082	6.005	1.346	-1.042

21	2	2	.690	2	.949	.744	1	.031	7.587	-.103	-.128
22	3	3	.865	2	.998	.291	2	.002	12.628	2.979	1.398
23	3	3	.865	2	.998	.291	2	.002	12.628	2.979	1.398
24	2	2	.690	2	.949	.744	1	.031	7.587	-.103	-.128
25	3	3	.865	2	.998	.291	2	.002	12.628	2.979	1.398
26	3	3	.865	2	.998	.291	2	.002	12.628	2.979	1.398
27	2	2	.557	2	.918	1.172	3	.082	6.005	1.346	-1.042
28	3	3	.436	2	.970	1.662	2	.030	8.637	1.435	1.794
29	2	2	.557	2	.918	1.172	3	.082	6.005	1.346	-1.042
30	3	3	.865	2	.998	.291	2	.002	12.628	2.979	1.398

**. Misclassified case

Annexure 10: Structure Matrix of Studies and CBPs

Structure Matrix- Studies		
	Function	
	1	**2**
q12[a]	.566*	-.030
q14	.562*	-.208
q2[a]	.536*	.365
q13[a]	.484*	-.409
q4[a]	.384*	-.062
q16[a]	.353*	-.060
q5[a]	.273*	.214
q17[a]	.242*	-.071
q15[a]	.239*	.070
q10[a]	-.068*	.008
q8	.421	-.626*
q7[a]	.256	-.567*
q3	.482	.483*
q1[a]	.346	.470*
q9[a]	.044	-.456*
q11	.385	.431*
q6[a]	.365	-.374*
q18[a]	.040	-.072*

Structure Matrix- CBPs		
	Function	
	1	2
q2	.618*	-.051
q4	.516*	.019
q6[b]	.484*	.098
q7[b]	.441*	.075
q14[b]	.393*	-.121
q8[b]	.323*	.227
q5[b]	.307*	-.280
q11[b]	.247*	-.217
q13[b]	.216*	.040
q15[b]	.171*	-.004
q10	.415	.879*
q12[b]	.170	.291*
q9[b]	.033	.228*
q16[b]	.108	.172*
q1[b]	.054	-.085*
q3[b]	.009	-.021*