Chapter - 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 GENERAL RECOMMENDATIONS APPLIED TO CONSTRUCTION INDUSTRY

The ANOVA test shows that the stresses developed in engineers due to ORS, RE & LH are higher in Contractors’ organizations at all the levels. For other types of organizations the stresses developed in engineer due to ORS, RE & LH are not significant except in PMC Engineers due to ORS. The reasons behind this situation are that the Contractors’ projects are located in remote areas where infrastructural facilities are not available.

The conclusions and Recommendations given later from 5.5 in this thesis based on statistical analysis give an understanding of the parameters to be improved under ORS, RE and LH. The practical implication under each parameter in construction industry is explained below.

5.2 ORGANISATIONAL ROLE STRESS

1. **Inter Role Distance**: Provide facilities to the Engineers on Construction Projects to have contact with family members, parents, children, friends, society, etc as desired by engineers.

2. **Role Stagnation**: Provide opportunities to upgrade engineers’ education and skills by providing them training and also provide exposure to the new developments in the construction industry in terms of technology and management. This will help engineers to get suitable promotions.

3. **Role Expectation Conflict**: Avoid misunderstanding of engineers and provide clear cut job description of engineers to their bosses, peers and subordinates.

4. **Role Erosion**: Because of politics in the organization or because the work is entrusted to engineers without improving his qualifications and skills required for the job the role erosion occurs. To improve the situation of stresses occurred due to role erosion engineers capability must be analyzed initially before entrusting the work on him. Also avoid the organizational politics and improve fairness in internal dealings.

5. **Role Overload**: Engineers on construction projects are always scarce. Understaffing should be avoided. Engineers must be given the work as per qualification, skills and experience not for more than 8 hrs in a day. There must be one holiday in a week.

6. **Role Isolation**: Proper linkages with the role of the engineers should be established with the bosses, peers and subordinates through meetings at least once in every week. Meetings will avoid the feeling of isolation amongst engineers and helping environment will be created.

7. **Personal Inadequacy**: Training and exposure to improve qualifications and skills must be provided to remove stresses due to personal inadequacy.
8. **Self Role Distance**: Analyze engineers in terms of their likings and disliking in the work and provide them the jobs of their likings.

9. **Role Ambiguity**: To remove the stresses due to role ambiguity, role of each engineer must be available in writing to him.

10. **Resource Inadequacy**: Provide adequate resources to engineers to enable him to perform his role and also train him to use management techniques of resource allocation.

5.3 **ROLE EFFICACY**

1. **Centrality**: Make engineers realize the importance of his and each and every role in the organization. Provide incentives for engineer’s roles if performed professionally.

2. **Self Role Integration**: Work to each engineer must be given only after analyzing his liking, disliking and the aptitude towards that work.

3. **Proactivity**: Engineers must be trained for efficient and effective planning skills and appreciations must be given to the planning done professionally.

4. **Creativity**: Freedom must be given to engineers to work innovatively and their efforts must be appreciated by providing all the help for their innovation.

5. **Inter Role Linkages**: Formal and Informal meetings must be organized once in a week to remove isolation and distance amongst the engineers.

6. **Helping Relationship**: Helping culture should be inculcated in the organization by training engineers to understand the importance of help through examples by boss to subordinate and workers.

7. **Superordination**: Engineers must be made to understand the importance of social obligation and look beyond their organizational roles to be helpful to the society.

8. **Influence**: Organization must make a role influential by providing each engineering position through written power and accountabilities in their roles.

9. **Growth**: Organization must provide the potential for growth in engineers’ roles. For growth, continuing upgradation of qualifications and skills is a must.

10. **Confrontation**: A healthy confrontation culture must be inculcated in the organization by encouraging engineers to ask fruitful questions against any decision by the higher authority to achieve projects and organizations objectives.
5.4 LEARNED HELPLESSNESS

1. **External Specific Stable**: Provide adequate healthcare, education, entertainment facilities to engineers.

2. **Internal Specific Unstable**: Provide decent housing and food facilities. Provide efficient and effective communication facilities.

3. **Internal Global Stable**: Provide adequate safety measures on work sites. Prevent consumption of Alcohol and drugs on construction sites.

4. **External Specific Unstable**: Provide adequate transportation and shopping facilities.

5. **Internal Global Unstable**: Provide adequate financial packages. Provide good training facilities.

6. **External Global Stable**: Provide decent and livable environment to engineers.

7. **Internal Specific Stable**: Provide 8 hrs working time with one holiday every week.

8. **External Global Unstable**: Provide banking facilities. Provide good educational facilities for engineers children.

5.5 CONCLUSIONS BASED ON BASIC STATISTICS AND DEMOGRAPHIC CHARACTERISTICS

i) Since the construction is mainly a male-dominated industry it is characterized by rough language, indecency and at times, alcoholism. Induction of more female engineers will make the work environment more sober and decent. This will also have a favourable impact on productivity.

ii) Master’s level education is very low (6.5%) in Developer’s and Government organizations. Also in contractor and PMC organizations the Masters level education is ranging from 25% to 35% which is also low as compared to Bachelor’s level.

This situation is due to the fact that construction business is not conducted by Professional Managers but it is being conducted by artisans (skilled workers) and experienced engineers.

If Master’s level education is made compulsory at least upto middle level engineers the business may be conducted by professionals and it would create conducive environment for better results.

The age distribution is very good in contractors’, PMCs’ and Developers’ engineers. While among Govt. engineers age distribution is not desirable as 94.5% engineers at bottom level are above 45 years of age. It means there is very low morale among Government engineers as they are not getting promotions even after long term experience.
Government needs to look after role stagnation factor to improve the productivity of engineers.

5.6 CONCLUSIONS AND RECOMMENDATIONS BASED ON THE MEAN VALUES OF ORS, RE AND LH VARIABLES

The above analysis shows that the null hypotheses related to ORS variables are not holding good so they are to be rejected.

The ORS variables to various types and levels of engineers are shown in the above table.

Most significant variables affecting all types and levels of engineers are RE, PI, RO and RS.

So these ORS variables are needed to be attended to improve the ORS environment in construction industry. This will also improve the total working environment in construction industry.
### Table-5.2
Most Significant RE Variables as per basic statistics of mean

<table>
<thead>
<tr>
<th></th>
<th>Centrality</th>
<th>Integration</th>
<th>Proactivity</th>
<th>Creativity</th>
<th>Inter-role Linkages</th>
<th>Helping Relationship</th>
<th>Subordination</th>
<th>Influence</th>
<th>Growth</th>
<th>Confrontation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall top level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall middle level</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall bottom level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PMC top level</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PMC middle level</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PMC bottom level</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CE top level</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CE middle level</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CE bottom level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DE top level</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DE middle level</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DE bottom level</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GE top level</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GE middle level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GE bottom level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>8</td>
<td>2</td>
<td>2</td>
<td>15</td>
<td>9</td>
<td>15</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>%</td>
<td>50</td>
<td>12.5</td>
<td>12.5</td>
<td>93.75</td>
<td>55.25</td>
<td>93.75</td>
<td>12.5</td>
<td>12.5</td>
<td>13.75</td>
<td>63.75</td>
</tr>
</tbody>
</table>

The above results shows that only RE variables viz. "Creativity" and "Helping Relationship" affect all types and all levels of engineers except PMC engineers.

This indicates that null hypothesises related to RE variables do not hold good and are to be rejected. Other RE variables viz. "Centrality" and "Inter Role Linkages" also affect the engineers as shown in the table above.

**So except these RE variables other RE variables** are required to be improved to improve the RE environment and hence total working environment in construction industry.
### Table 5.3
Most Significant LH Variables as per basic statistics of mean

<table>
<thead>
<tr>
<th></th>
<th>ESS</th>
<th>ISU</th>
<th>IGS</th>
<th>ESU</th>
<th>IGU</th>
<th>EGS</th>
<th>ISS</th>
<th>EGU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Overall top level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Overall middle level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Overall bottom level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>PMC top level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>PMC middle level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>PMC bottom level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>CE top level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>CE middle level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>CE bottom level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>DE top level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>DE middle level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>DE bottom level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>GE top level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>GE middle level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>GE bottom level</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>16</td>
<td>16</td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>%</td>
<td>100</td>
<td>100</td>
<td>50</td>
<td>75</td>
<td>81.25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The above result shows that the null hypotheses for LH viz. number 3, 6, 9 and 12 are found to be true and accepted. All types and all levels of engineers are affected by LH variables similarly. Viz. ESS, ISU, ISS and EGU.

Only ESU LH factor affects on Contractors’, Developers’ and Government Engineers at top middle and bottom levels additionally.

So these factors are required to be improved to improve the LH environment and in turn total environment in the construction industry.
5.7 CONCLUSIONS AND RECOMMENDATIONS FROM INTERCORRELATIONS BETWEEN LEARNED HELPLESSNESS (LH) AND ORGANISATION ROLE STRESS (ORS) VARIABLE

1) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variable (overall levels and types) at p < .05 with n=502.

If construction industry as a whole wants to improve the LH environment, their it has to improve following ORS dimensions as per following priority:

RA, REC, RI, PI and SRD

Also most affected LH factors by ORS dimensions are ISS, ESS, LHT, IGU and ISU. If care is taken to improve upon above LH factors and ORS dimensions the total scenario of CI will be improved.

2) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (overall top level) at p < .05 with n = 57

For the improvement in overall top level engineers in the LH environment only ORS dimensions as per following priority needed to be improved:

RS, SRD and RA

The LH factors are not requiring any major improvement as all the LH factors themselves are not much affected individually except ESS. This will improve the total working environment at over all top level Engineers.

3) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (overall middle level) at p < .05 with n=178

For improvement in the overall middle level engineers in the LH environment the ORS dimension as per following priority are needed to be improved:

ORST, SRD, RA, REC and PI

Also the LH factors in following priority needed to be improve for improving the above mentioned ORS dimensions:

ISS, ESS, LHT, ISU AND EGU

This will improve the total working environment at overall middle level engineers.

4) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (overall bottom level) at p < .05 with n=267

For overall bottom level engineers the LH environment can be improved by improving ORS dimensions in following priority viz:

RA, RE and PI
Also following LH factors are needed to be improve ORS environment in following priority viz:

ESS and ISS

This will improve the total working environment at overall bottom level engineers.

5) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (overall PMC Engineers) at p < .05 with n=143

For PMC engineers at all levels the LH environment can be improved by improving ORS dimensions in following priority viz:

RA, RS and PI

Also only LH factor (ISS) is needed to be improved for improving ORS environment.

This will improve the total working environment at all levels among PMC engineers.

6) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (overall Contractor’s Engineers) at p < .05 with n = 167

For Contractor’s engineers at all levels the LH environment can be improved by improving ORS dimensions in following priority viz:

REC, RI and PI

Also following LH factors are needed to be improve ORS environment in following priority viz:

ESS, LHT, ISU, IGU, ESU and EGS

This will improve the total working environment at all levels among Contractor’s Engineers.

7) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (overall Developer’s Engineers) at p < .05 with n = 145

For overall Developer’s Engineers the LH environment can be improved by improving only RA ORS dimensions.

Also only ESS LH factor is needed to be improved for improving ORS environment

This will improve the total working environment at all levels among Developers’ Engineers.
8) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (overall Government’s Engineers) at p < .05 with n = 47

For overall Government Engineers the LH environment can be improved by improving ORS dimensions in following priority viz:

RA, RO and REC

Also following LH factors are needed to be improve ORS environment in following priority viz:

ISS, LHT and ESS

This will improve the total working environment at all levels among Government Engineers.

9) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (PMCE top level) at p < .05 with n = 10

For PMC Engineers at top level only (IRD) ORS dimension is needed to be improved for improving LH environment

Also no LH factors are needed to be improved to improve ORS environment

The improvement in IRD dimensions will improve the working environment among PMC Engineers.

10) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (PMCE middle level) at p < .05 with n = 42

For PMC engineers at middle level the LH environment can be improved by improving ORS dimensions in following priority viz:

SRD and RA

Also following LH factors are needed to be improve ORS environment in following priority viz:

IGS, LHT & ESS

This will improve the total working environment among PMC Engineers.

11) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (PMCE bottom level) at p < .05 with n = 91

For PMC Engineers at bottom level only ORS dimension (RA) is required to be improved for improving LH environment.
Also only LH factor (ISS) is needed to be improved to improve ORS environment. This will improve the total working environment among PMC Engineers at bottom level.

12) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (Contractor’s Engineers top level) at \( p < .05 \) with \( n = 16 \)

For Contractor’s engineers at top level the ORS and LH environments are quite good. Except for slight improvement in IRD, RE, RA, RS & RO nothing is affecting the good working environment among Contractor’s Engineers.

13) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (Contractor’s Engineers middle level) at \( p < .05 \) with \( n = 69 \)

For Contractor’s engineers at the middle level the LH environment can be improved by improving ORS dimensions in following priority viz:

RI, RO and SRD

Also following LH factors are needed to be improve ORS environment in following priority viz:

ESS, LHT and ISU

This will improve the total working environment among Contractor’s Engineers at the middle level.

14) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (Contractor’s Engineers bottom level) at \( p < .05 \) with \( n = 82 \)

For Contractor’s engineers at the bottom level the LH environment can be improved by improving ORS dimensions in following priority viz:

RS and RA

Also following LH factor are needed to be improve ORS environment in following priority viz:

ESS only

This will improve the total working environment among Contractor’s Engineers at the bottom level.
15) **Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (Developer's Engineers top level) at p < .05 with n = 15**

Like Contractor's engineers at top level here also the total working environment is quite good among Developer's Engineers at the top level. Only SRD ORS dimension and IGS LH factor are needed to improve slightly.

16) **Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (Developer's Engineers middle level) at p < .05 with n = 54**

For Developer's Engineers at the middle level the LH environment can be improved by improving ORS dimensions in following priority viz:

RA and RI

Also only LH factor (ISS) is needed to be improved for improving ORS environment.

This will improve the total working environment among Developer's Engineers at the middle level.

17) **Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (Developer's Engineers bottom level) at p < .05 with n = 76**

For the Developer's Engineers at the bottom level the LH environment can be improved by improving ORS dimensions in following priority viz:

RA and RE

Also following LH factors are needed to be improve ORS environment in following priority viz:

ESU, ESS and ISU

This will improve the total working environment among Developer's Engineers at bottom level.

18) **Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (Government's Engineers top level) at p < .05 with n = 16**

For Government Engineers at top level the LH environment can be improved by improving ORS dimensions in following priority viz:

RA, REC, RS and SRD

Also following LH factors are needed to be improve ORS environment in following priority viz:
ESS, ESU and ISU

This will improve the total working environment among Government Engineers at top level.

19) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (Government's Engineers middle level) at $p < .05$ with $n = 13$

For Government Engineers at the middle level the total working environment is quite good.

Only ORS dimensions (PI and IRD) and only LH factor (ISU) needed to be improved for total working environment to become better.

20) Conclusions and recommendations from Intercorrelations between Learned Helplessness (LH) and Organisational Role Stress (ORS) variables (Government's Engineers bottom level) at $p < .05$ with $n = 18$

For Government Engineers at the bottom level all ORS dimensions and the LH factors (ESS and ISU) are needed to be improved for improving total working environment among Government Engineers at the bottom level.
5.8 CONCLUSIONS AND RECOMMENDATIONS FROM INTERCORRELATIONS BETWEEN LEARNED HELPLESSNESS (LH) AND ROLE EFFICACY (RE) VARIABLES

1) Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (overall levels and types) at p<.05 with n = 502

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Confrontation, Influence and Creativity

Also following LH factors are needed to be improved to improve LH environment in the construction industry with following priority:

EGS, EGU, IGS and ISS

This will improve the total working environment of construction industry.

2) Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (overall top level) at p < .05 with n= 57

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Centrality, Inter-Role Linkages, Influence and Confrontation

Also following LH factors are needed to be improved to improve LH environment in the construction industry with following priority:

EGS, ISS, EGU and IGS

This will improve the total working environment of construction industry.

3) Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (overall middle level) at p < .05 with n = 178

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Centrality, Superordination, Creativity, Proactivity and Growth

Also following LH factors are needed to be improved to improve LH environment in the construction industry with following priority:

EGS, ISS, EGU and IGS

This will improve the total working environment of construction industry.
4) Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (overall bottom level) at p < .05 with n = 267

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Centrality, Helping Relationship, Inter-Role Linkages, Superordination and Growth

Also following LH factors are needed to be improved to improve LH environment in the construction industry with following priority:

IGU, EGS, IGS and EGU

This will improve the total working environment of construction industry.

5) Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (overall PMC Engineers) at p < .05 with n = 143

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Centrality, Helping Relationship, Proactivity, Creativity and Growth

Also following LH factors are needed to be improved to improve LH environment in the construction industry with following priority:

IGS, IGU, EGS and ISU

This will improve the total working environment among PMC Engineers in construction industry.

6) Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (overall Contractor's Engineers) at p < .05 with n = 167

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Superordination, Proactivity, Helping Relationship and Confrontation

Also following LH factors are needed to be improved to improve LH environment in the construction industry with following priority:

EGS, EGU, IGS and ISS

This will improve the total working environment among Contractor's Engineers in construction industry.
7) **Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (overall Developer's Engineers) at p < .05 with n = 145**

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

- Centrality, Superordination, Helping Relationship, Influence and Creativity

Also following LH factors are needed to be improved to improve LH environment in the construction industry with following priority:

- IGS, EGS, ISS, EGU and IGU

This will improve the total working environment among Developers' Engineers in construction industry.

8) **Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (overall Government Engineers) at p < .05 with n = 47**

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

- Centrality, Inter-Role Linkages, Creativity, Helping Relationship, Influence and Confrontation

Also following LH factors are needed to be improved to improve LH environment in the construction industry with following priority:

- IGU, EGU, EGS and ISU

This will improve the total working environment among Government Engineers in construction industry.

9) **Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (PMC Engineers top level) at p < .05 with n = 10**

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

- Integration and Proactivity

Also all LH factors are needed to be improved to improve LH environment in the construction industry.

This will improve the total working environment among PMC Engineers in construction industry.
10) **Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (PMC Engineers middle level) at p < .05 with n = 42**

All RE dimensions except Integration are needed to be improved for improving RE environment in the construction sector.

Also all LH factors are needed to be improved to improve LH environment in the construction industry.

This will improve the total working environment among PMC Engineers at middle level.

11) **Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (PMC Engineers bottom level) at p < .05 with n = 91**

All RE dimensions are needed to be improved for improving RE environment in the construction sector.

Also all LH factors except EGU are needed to be improved to improve LH environment in the construction industry.

This will improve the total working environment among PMC Engineers at bottom level.

12) **Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (Contractor’s Engineers top level) at p < .05 with n = 16**

All RE dimensions are needed to be improved for improving RE environment in the construction sector.

Also all LH factors are needed to be improved to improve LH environment in the construction industry.

This will improve the total working environment among Contractor's Engineers at top level.

13) **Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (Contractors’ Engineers middle level) at p < .05 with n = 69**

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Centrality, Proactivity, Creativity, Superordination and Helping Relationship

Also following LH factors are needed to be improved to improve LH environment in the construction industry with following priority:
IGS, ISS, ESU and EGU
This will improve the total working environment among Contractor’s Engineers at middle level.

14) **Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (Contractor’s Engineers bottom level) at p < .05 with n = 82**

All RE dimensions are needed to be improved for improving RE environment in the construction sector.

Also all LH factors except ESS and ESU are needed to be improved to improve LH environment in the construction industry.

This will improve the total working environment among Contractor’s Engineers at bottom level.

15) **Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (Developers’ Engineers top level) at p < .05 with n = 15**

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Centrality, Proactivity, Creativity, Superordination and Helping Relationship

Also following LH factors are needed to be improved to improve LH environment in the construction industry with following priority:

EGS, IGU and EGU

This will improve the total working environment among Developers’ Engineers at top level.

16) **Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (Developers’ Engineers middle level) at p < .05 with n = 54**

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Centrality, Superordination, Creativity, Influence and Growth

Also following LH factors are needed to be improved to improve LH environment in the construction industry with following priority:

IGS, EGS and ISS

This will improve the total working environment among Developers’ Engineers at middle level.
17) Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (Developer's Engineers bottom level) at p < .05 with n = 76

All RE dimensions are needed to be improved for improving RE environment in the construction sector.

Also all LH factors are needed to be improved to improve LH environment in the construction industry.

This will improve the total working environment among Developer's at bottom level.

18) Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (Government’s Engineers top level) at p < .05 with n = 16

All RE dimensions are needed to be improved for improving RE environment in the construction sector.

Also all LH factors are needed to be improved to improve LH environment in the construction industry.

This will improve the total working environment among Government Engineers at top level.

19) Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (Government’s Engineers middle level) at p < .05 with n = 13

All RE dimensions are needed to be improved for improving RE environment in the construction sector.

Also all LH factors are needed to be improved to improve LH environment in the construction industry.

This will improve the total working environment among Government Engineers at middle level.

20) Conclusions and Recommendations from Intercorrelations between Learned Helplessness (LH) and Role Efficacy (RE) variables (Government’s Engineers bottom level) at p < .05 with n = 18

All RE dimensions except Integration and Creativity are needed to be improved for improving RE environment in the construction sector.

Also all LH factors except ESS are needed to be improved to improve LH environment in the construction industry.

This will improve the total working environment among Government Engineers at bottom level.
5.9 CONCLUSIONS AND RECOMMENDATIONS FROM INTERCORRELATIONS BETWEEN ORGANISATIONAL ROLE STRESS (ORS) AND ROLE EFFICACY (RE) VARIABLES

1) Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (overall types and levels) at \( p < .05 \) with \( n = 502 \)

All RE dimensions except Superordination are needed to be improved for improving RE environment in the construction sector.

Also all ORS dimensions except IRD are needed to be improved to improve ORS environment in the construction industry.

This will improve the total working environment of construction industry.

2) Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (overall top level) at \( p < .05 \) with \( n = 57 \)

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Growth, Creativity, Confrontation and Inter-Role Linkages

Also all ORS dimensions except RE, RO and RIN are needed to be improved to improve ORS environment in the construction industry.

This will improve the total working environment among overall Engineers at top level.

3) Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (overall middle level) at \( p < .05 \) with \( n = 178 \)

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Confrontation, Integration, Growth and Creativity

Also following ORS dimensions are needed to be improved to improve ORS environment in the construction industry with following priority:

RA, SRD, PI, RI, REC and RS

This will improve the total working environment among overall Engineers at middle level.
4) Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (overall bottom level) at p < .05 with n = 267

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Growth, Integration, Creativity and Influence

Also all ORS dimensions except IRD and RE are needed to be improved to improve ORS environment in the construction industry.

This will improve the total working environment among overall Engineers at bottom level.

5) Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (overall PMC Engineers) at p < .05 with n = 143

All RE dimensions except Centrality, Proactivity and Superordination are needed to be improved for improving RE environment in the construction sector.

Also all ORS dimensions except IRD and RIN are needed to be improved to improve ORS environment in the construction industry.

This will improve the total working environment among overall PMC Engineers.

6) Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (overall Contractor's Engineers) at p < .05 with n = 167

All RE dimensions except Superordinations are needed to be improved for improving RE environment in the construction sector.

Also all ORS dimensions except IRD and RE are needed to be improved to improve ORS environment in the construction industry.

This will improve the total working environment among overall Contractor's Engineers.

7) Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (overall Developer's Engineers) at p<.05 with n = 145

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Confrontation and Growth
Also following ORS dimensions are needed to be improved to improve ORS environment in the construction industry with following priority: REC, SRD and RIN

This will improve the total working environment among overall Developer’s Engineers.

8) **Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (overall Government Engineers) at \( p < .05 \) with \( n = 47 \)**

All RE dimensions except Inter-Role Linkages, Helping Relationship and Confrontation are needed to be improved for improving RE environment in the construction sector.

Also all ORS dimensions except RE are needed to be improved to improve ORS environment in the construction industry.

This will improve the total working environment among overall Government Engineers.

9) **Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (PMC Engineers top level) at \( p < .05 \) with \( n = 10 \)**

The RE and the ORS environments are very good among PMC top level Engineers. There is no need to improve any RE or ORS dimensions.

10) **Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (PMC Engineers middle level) at \( p < .05 \) with \( n = 42 \)**

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Helping Relationship, Confrontation and Integration

Also following ORS dimensions are needed to be improved to improve ORS environment in the construction industry with following priority:

RA, SRD and PI

This will improve the total working environment among PMC Engineers at middle level.
11) Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (PMC Engineers bottom level) at p<.05 with n = 91

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Influence, Confrontation, Creativity and RIL

Also following ORS dimensions are needed to be improved to improve ORS environment in the construction industry with following priority:

IRD, RE and RIN

This will improve the total working environment among PMC Engineers at bottom level.

12) Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (Contractor's Engineers top level) at p < .05 with n = 16

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Creativity and Confrontation

Also following ORS dimensions are needed to be improved to improve ORS environment in the construction industry with following priority:

PI

This will improve the total working environment among Contractor's Engineers at top level.

13) Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (Contractor's Engineers middle level) at p < .05 with n = 69

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Confrontation, Integration, Inter Role Linkages, Growth and Creativity

Also following ORS dimensions are needed to be improved to improve ORS environment in the construction industry with following priority:

REC, SRD, RO and RA

This will improve the total working environment among Contractor's Engineers at middle level.
14) Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (Contractor's Engineers bottom level) at $p < .05$ with $n = 82$

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Proactivity, Inter Role Linkages, Growth, Creativity and Influence

Also following ORS dimensions are needed to be improved to improve ORS environment in the construction industry with following priority:

RI, REC, PI and SRD

This will improve the total working environment among Contractor's Engineers at bottom level.

15) Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (Developer's Engineers top level) at $p < .05$ with $n = 15$

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Confrontation, Inter Role Linkages and Growth

Also following ORS dimensions are needed to be improved to improve ORS environment in the construction industry with following priority:

IRD, REC, RI and PI

This will improve the total working environment among Developer's Engineers at top level.

16) Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (Developer's Engineers middle level) at $p < .05$ with $n = 54$

Only Confrontation dimension of RE dimensions are needed to be improved for improving RE environment in the construction sector.

Only RE and REC dimensions of ORS dimensions are needed to be improved to improve ORS environment in the construction industry.

This will improve the total working environment among Developer's Engineers at middle level.
17) **Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (Developer's Engineers bottom level) at p < .05 with n = 76**

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Inter Role Linkages, Confrontation, Centrality and Growth

Also following ORS dimensions are needed to be improved to improve ORS environment in the construction industry with following priority:

REC, RIN and RO

This will improve the total working environment among Developer's Engineers at bottom level.

18) **Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (Government Engineers top level) at p < .05 with n = 16**

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Integration, Proactivity and Influence

Also following ORS dimensions are needed to be improved to improve ORS environment in the construction industry with following priority:

RS, RA, RI and RIN

This will improve the total working environment among Government Engineers at top level.

19) **Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (Government Engineers middle level) at p < .05 with n = 13**

Following RE dimensions are needed to be improved for improving RE environment in the construction sector with following priority:

Growth and IRL

Also RI dimensions of ORS dimensions are needed to be improved to improve ORS environment in the construction industry.

This will improve the total working environment among PMC Engineers at middle level.
20) Conclusions and Recommendations from Intercorrelations between Organisational Role Stress (ORS) & Role Efficacy (RE) variables (Government Engineers bottom level) at p < .05 with n = 18

All RE dimensions except Inter Role Linkages are needed to be improved for improving RE environment in the construction sector.

Also all ORS dimensions except RE are needed to be improved to improve ORS environment in the construction industry.

This will improve the total working environment among Government Engineers at bottom level.