


**Human Resources Challenges for Engineering Firms (How to Attract & Retain Talents).
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Introduction

This paper will present an account of engineering Human Resource Management situation in FCIC countries, particularly in keeping their permanent, capable talented consultants from brain drain and suggest measures for managing sustainable engineering communities through capacity building.





Theme of the 2022 International Engineering Forum Istanbul

- FCIC is continuously promoting Consultants from member countries in line with its chartered functions through different conferences, training sessions and forums. Discussion on 'Human Resource Management (HRM) challenges for engineering Firms' is one of such vital issues at the moment.
- Consulting activity represents, especially for developing nations, a basic milestone for a healthy and sustainable development. It deserves serious attention at all levels.





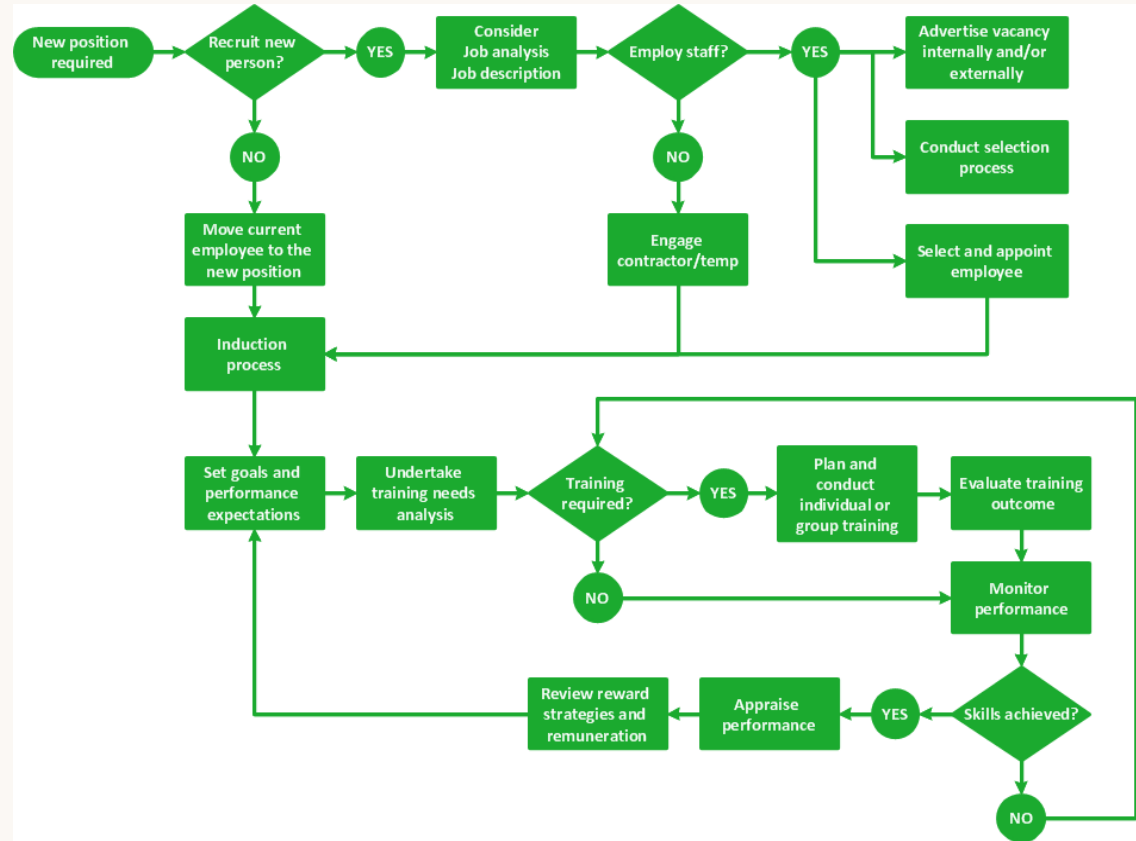
The principles of HR Management

The seven pillars of HRM are,



Recruitment and selection

People are the lifeblood of the organization and finding the best candidates is critical.



Performance management

Performance management of team members is important to achieve their best performance & to reward.





Learning and development

Learning & Development offers employees a way to bridge the skills gap and help become leaders.

Succession / Career planning

Succession planning results in the creation of a talent pool essential for any organization to prepare for retirement or departure of senior members.





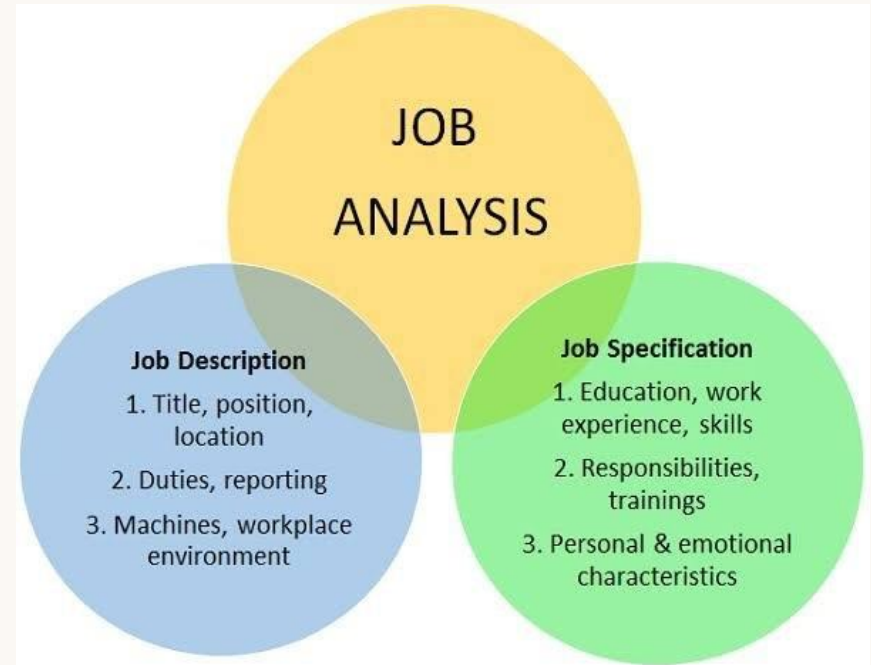
Compensation and Benefits

Appreciation and fair compensation are key to motivate and retain employees.



Human resource information system of HR data and analytics

For human resource management HRIS is the key element.

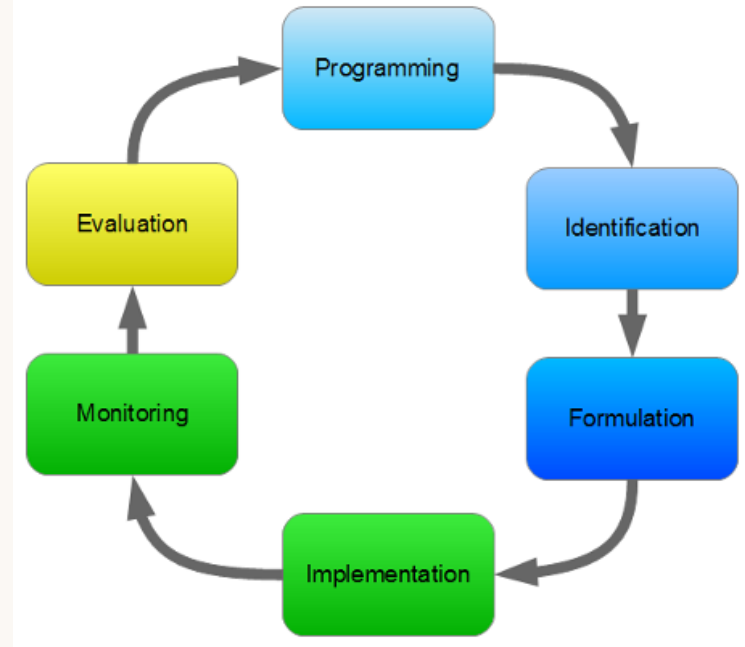


HRM Status in Consulting Services in FCIC Countries

- FCIC is comprised of 57 countries in four continents with a population of 1.25 billion and vast economic activities of (GDP US\$ 7.56 trillion (Nominal) and US\$22.149 trillion, (PPP) and annual investment in trade and industries by member nations (US\$ 50.0 billion) has a large . The number of engineering firms within the FCIC countries could be approximately 2,500. To facilitate the coverage of whole OIC area the FCIC has divided its areas into 10 regions.
- The FCIC does not only express or represent the interests of a profession, but rather that of an activity that has deep roots in the existence of the nations with a vast impact on the future.

Market Demand for Engineering Services

- The demand for engineering services in FCIC countries is on the rise due to rise in development activities required at all stages of project implementation.



The schematic diagram presents the project development cycle

Problems of HRM in Engineering and Technologies


There is an inherent shortage of talented engineering graduates in FCIC countries due to the factors not limited to the following:

- Number of projects has increased enormously.
- Lack of good quality engineering colleges & universities.
- Transfer of technology is not taking place.
- Supply of numbers of engineers may be adequate but the quality of expertise getting poorer due to inability of their employers to provide CPD. The employers in FCIC countries are facing problem of overhead expenses to retain staff and impart trainings in uneven competition.




KPI in HR for retention of Talents

Major KPI in HRM for retention of existing talents are summarized as:

- Retention of Talent envisaged mechanism for keeping an employee longer time with the firm.
 - Protect Absenteeism (employee turnover rate should be < 10% of employees).
 - Regular employee performance monitoring for outputs and quality.
 - Monitoring Employee satisfaction level.
 - Employee training & resource development.
- 



Action needed to improve Situation

- Assist the Engineering consulting firms in FCIC counties to follow credible institution building practices of human resource development.
 - Establish high quality educational institutes and universities under the auspices of OIC to continuously augment the stock of capable engineering talents.
 - Plan to include the rapid increase of enrolment of students in engineering programs.
 - Enriching the contents of engineering education to streamline the quality of engineering education in the FCIC countries.
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Action needed to improve Situation

Continuation...

- Engage & empower the local engineers with responsibility and authority to develop leadership & to reduce dependency on expatriates.
- Improve practice of scientific human resource management.





OIC Initiative to Increase Stock of Engineering Talents

OIC Center for Islamic Education have helped member countries setting up Technical Universities of repute in many Muslim Countries. Four such Universities are: Islamic University of Niger, Islamic University of Uganda (IUIU), Islamic University of Technology (IUT), Dhaka, and International Islamic University of Malaysia (IIUM).

There are some more in the pipeline such as King Abdullah bin Abdul Aziz University, Jeddah, Female Complex, Balkh University in Afghanistan, etc.





Experience of Bangladesh in Engineering Consultancy

Consulting Industry

Bangladesh has more than 100 engineering consulting firms of various sizes. The consultancy industry is the second largest employer of engineering graduates in the country.

Educational and Research Facilities

There are more than 30 Public Universities and Institutes and many more in private sector offering engineering and technology degrees. But except a few in the private sector, majority are much below standard.






Employment Opportunities of Engineering Graduates

More than 30% of graduates don't get job in the same passing year. About 10% tries to seek overseas job or take general administrative jobs. A small percentage of them pursue higher education. Providing entry level jobs for engineers is critical for skill development.

Demand –Supply of Quality of Engineers

The country has a very large number of projects being implemented and all engineering consulting firms are engaged. Their engineering staffs particularly at senior and mid-level positions are sometimes overloaded. The supply of skilled engineers is inadequate.






Continuation...

The limited number of experts acknowledged for their professional specialization are in high demand. The flock of such engineers usually practice free launching their CVs everywhere. Competing firms use their CVs for gaining higher scores in bidding. But once they win, they cannot make the experts available.

QCBS procurement method

Quality and cost based selection approach of donor aided project often becomes a problem for the consulting firm. The advertised project requires bests of experts with full of experience but must be at competitive price. Often QCBS projects lead to poor quality of workmanship due to 'paper tiger experts' engaged at cheaper price.



International Comparison of Engineering Development

- Engineering has got very strong relationship with the quality of infrastructure of a country, human resource base and most importantly with per capita and national GDP growth.
- Royal Academy of Engineering, London have undertaken a study under its Center for Economic and Business Research (CEBR) called “engineering and economic growth: a global view”, in 2016. The study aimed to highlight and explore the relationship between engineering and development.
- Infrastructure improvement is a product of engineering acumen and design. To facilitate the study the RAE has constructed an Engineering Index. The data were collected from 99 countries in 5 different regions across the globe for 2013-14 and constructed the Index.

Results of the Global Engineering Indexing

1. Sweden, Denmark, the Netherlands, Germany and Japan rank highest with scores above 70%.
2. CAETS (Council of Academies of Engineering and Technological Science) countries perform strongly securing top 15 positions.
3. From African region two countries Tunisia and South Africa scored just above 40%.

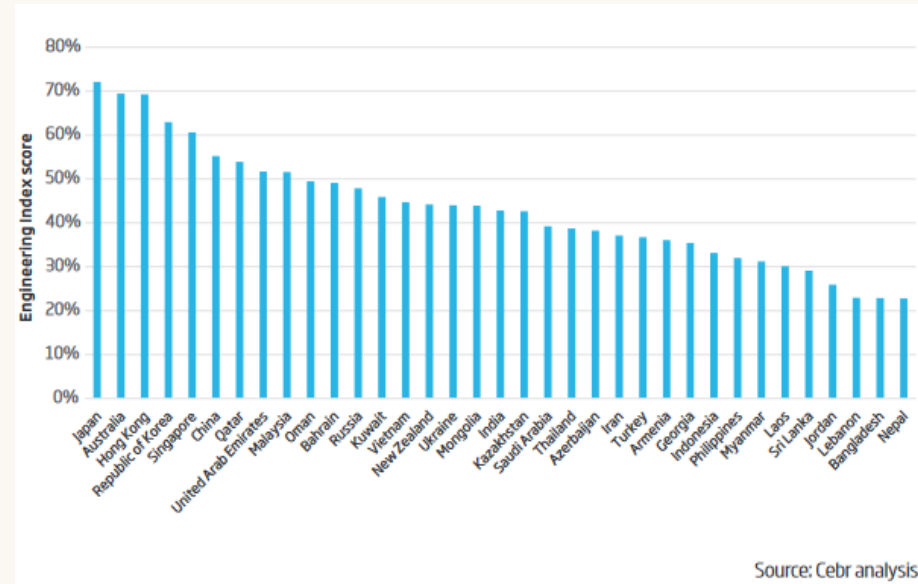


Fig: Engineering Index scores by country: Asia and Oceania

Engineering Index of Islamic Countries

The following table shows the engineering index for Islamic countries where out of 57 OIC countries only 24 were included due to unavailability of data.

The table shows Engineering Index and its relation with 4 indicators.

Table 12: Results of the Engineering Index of Islamic Countries

Country	Engineering Score (%)	Engineering Employment (%)	Quality of Infrastructure (%)	Digital Connectivity	Avr. GDP Growth 2003-07 (%)	GDP Per capita US\$(N)	GDP Per capita US\$(PPP)
Albania	34	31	39	35	5.6	5,626	14,095
Algeria	39	23	26	35	5.5	4,845	16,246
Azerbaijan	38	46	59	35	19.4	4,764	18,911
Bahrain	49	54	71	40	6.6	26,277	51,354
Bangladesh	23	38	14	35	6.1	2,780	7,900
Benin	18	38	5	35	3.9	1,040	2,546
Bosnia-Herzegovina	34	24	19	36	-	6,140	14,221
Burundi	20	43	12	35	-		
Egypt	28	24	21	35	4.7	2,501	14,045
Indonesia	33	43	37	35	5.3	4,290	14,009
Iran	44	26	39	35	5.6	4,961	22,320
Jordan	28	20	51	36	6.2	10,165	28,254
Kazakhstan	49	49	46	35	8.9	10,165	28,254
Kuwait	50	50	43	41	7.8	30,109	68,822
Malaysia	53	43	78	37	5.8	12,240	32,673
Morocco	38	28	49	35	4.4	3,625	9,400
Mozambique	22	29	10	35	7.6	481	1390
Nigeria	24	24	5	35	7.0	2,387	6,107
Oman	53	47	61	37	5.4	19,487	47,183
Qatar	33	74	78	41	7.0	68,977	133,357
Saudi Arabia	26	33	63	36	6.4	29,538	57,041
Tunisia	43	27	33	35	5.5	3,568	12,682
Turkey	59	30	61	37	6.4	11,602	29,741

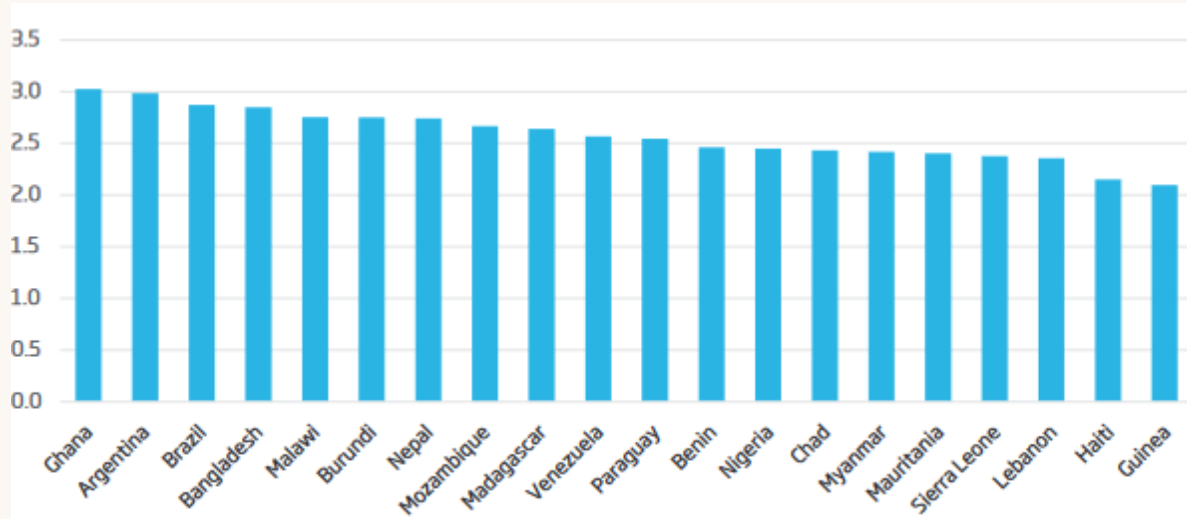


Results of Quality of Infrastructure and GDP per capita

Using the measure suggested by WEF Global Competitive Index on the quality of infrastructure, majority of highly scoring nations are developed countries. Bangladesh, Burundi, Mozambique, Benin, Nigeria, Chad and Lebanon are placed in the bottom 20 nations in terms of quality of infrastructure.



Results of Quality of Infrastructure and GDP per capita



Source: World Economic Forum Global Competitiveness Index

Fig: Bottom 20 countries by their score on the WEF GCI 'quality of overall infrastructure'

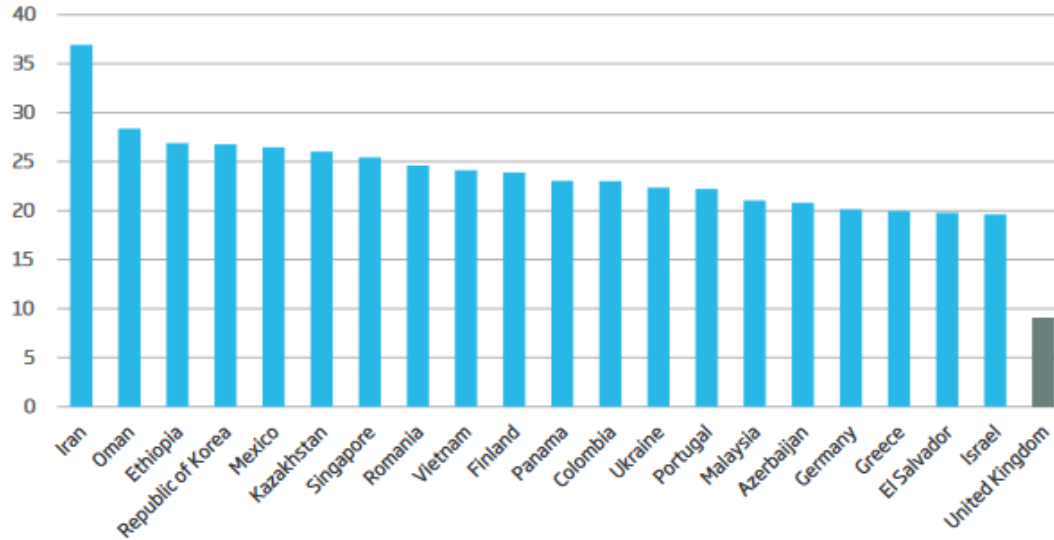


Engineering Indexing & Engineering Students Enrollment at Tertiary Level

The results of Indexing presented findings of number of engineering students in tertiary education across the 99 sample countries. It was found that while some countries have seen an increase in the number of engineering students, but they have not increased spending on university engineering departments.



Engineering Indexing & Engineering Students Enrollment at Tertiary Level



Source: UNESCO World Economic Forum, Cebr analysis

Fig: Top 20 countries by the percentage of students in tertiary education enrolled in engineering, manufacturing and construction programmes, United Kingdom included for comparison, latest year

Results of GDP per capita and Engineering Index

Comparisons provided by the Global Engineering Index, shows majority of the OIC countries are placed in the bottom 20 lists of poor-quality infrastructures.

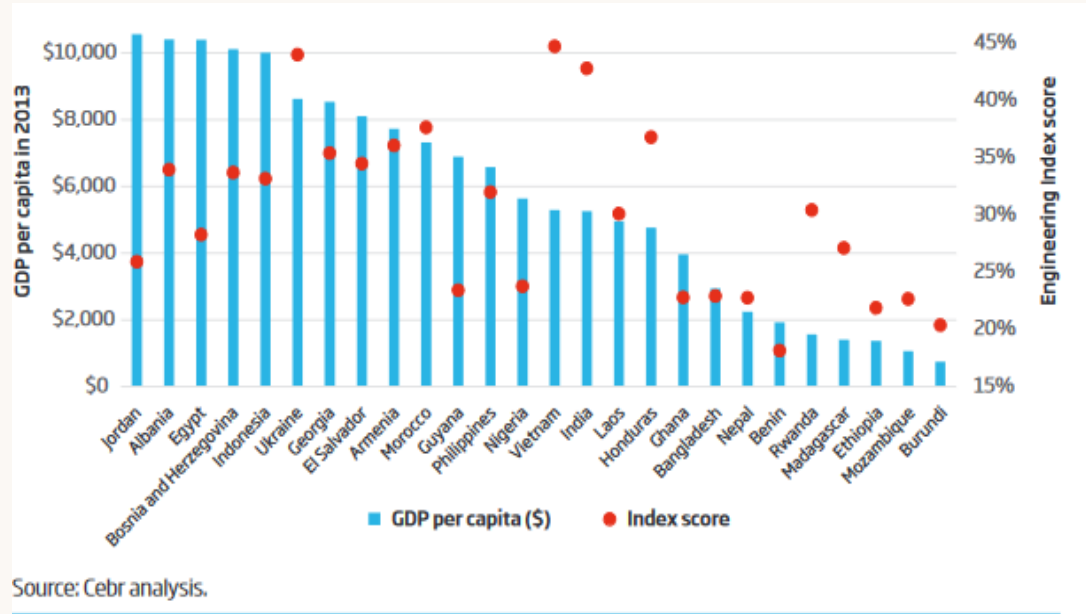



Fig: Bottom-ranked countries by GDP per capita (international \$ PPP terms, LHS) and Engineering Index

Conclusions and Recommendations

1. Greater Role of FCIC:

Engineering being the key player in the development activities of a country, the demand of high-quality engineers will always be increasing. To improve the engineering development in OIC countries the existing level of efforts, investment are marginal. Although the initiatives and efforts given by the IDB and OIC are appreciated in the global scenario, we need to do more. The IDB, FCIC, COMSTECH and other associated agencies under the unified banner must take greater roles and responsibilities promoting engineering capabilities in member countries.



Policy recommendation for enhancement and preservation of engineering resources in OIC countries:

2. Appreciation and encouragement to Resource development

For imparting training to staff the employers must bear the cost. On the job training requires continuity in service adding to payroll burden for idle time, other social costs and employee benefits. These add to the company operating cost. The employers are reluctant to spend on training in any form due to increased overhead. During the bidding for a project many firms prefer to include freelance experts on contract with low mark-up to win the job. On the other hand the consulting firms who maintain regular permanent staff propose their in-house experts with proper training and proven expertise loses the bid due to higher price under the current QCBS process of bid evaluation.






2. Appreciation and encouragement to Resource development

Continuation...

In the past there has been standard practice of preferring the permanent staff over temporary staff and where the client allowed extra 5% to 10% of allocated marks for permanent staff which to ensure proven performance with commitment. That somehow compensated for additional cost of in house training and resource development. Currently there is no distinction between full time staff employee and part time temporary staff in technical evaluation. To encourage staff training & skill development, FCIC needs to take up this issue with IsDB and other funding agencies. Otherwise every firm will go for street shopping and most of the times will end up with 'paper tigers' without having actual expertise.





3. Controlling unlawful migration of engineers to other firms

The donors and clients should not allow any expert to be proposed only on the basis of consent of persons concerned. This encourages unwanted and silent migration of company talented engineers. The practice should be stopped and mandatory requirement of written consent from his employer solicited before proposing the staff. This will guarantee the employers from risk of losing their experts and in turn encourage regular employment, training and development of expertise in real sense.





4. Reduce replacement burden of client

Individual has the right to look for better opportunity. But there needs be control on proposing one in new project proposal who is already working under contract for another employer or for the same client. This practice causes setback in the ongoing or in the new project due to need for replacement in at least one project. There should be restrictions on proposing any expert in new bids who is already working in projects under the same client or owner.





THANK YOU

