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Impact of Total Quality Management on Mineral Resources Development in Pakistan

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Abstract
This study determines the effects of Total Quality Management (TQM) practices on the mineral resources development (MRD) in Pakistan. It also studies the role of Federal and Provincial governments as well as investors in moderating TQM practices and MRD. The study also underpins contextual major issues in the mineral sector of Pakistan. In order to achieve these objectives, quantitative data has been obtained randomly through survey from 300 randomly selected research respondents such as managers, lease owners, geologists, mining engineers, mines workers etc. Statistical techniques have been used with the help of SPSS v.21. The findings of the study indicate that TQM practices such as top management, customer satisfaction, employee involvement, and continuous improvement have strong positive correlation and significant positive effects on MRD. Major issues include the lack of resources, organizations' emphasize on short term rather than long term gain, lack of top management commitment, and managers don't have adequate knowledge of TQM. Moderation analysis shows significant negative role of Federal and Provincial government, and low significant positive role of investors.
Keywords: Total Quality Management, Mineral Resources Development, TQM Practices, Federal/Provincial Government, Investors, Pakistan.

Introduction

A dramatic change has been noted around the globe in terms of business. Developed countries, kept on experiencing different management philosophies, strategies, practices, tools and techniques to enhance their effectiveness, productivity and quality as a whole of industry. Among other management philosophies they adopted and accepted Total Quality Management (TQM) as a management paradigm in an organization with its essential practices or elements, i.e. (Top Management's Leadership, Customer Satisfaction, Employee Involvement, Teamwork, Continuous Improvement, Training, Strategic Planning etc.) to advance the performance of an organization (Akgün, 2014; Ashref Abdelsalam Ali Elfaituri A, 2012). As part of this, TQM captured special attention because "Gurus" of TQM such as (B.Crosby ,1980, 1984, 1989; Deming, 1986, 1994; Feigenbaum, 1983; Juran & Godfrey, 1998), contributed with different ideas, frameworks, to increase business profit but importantly they all consent on that total quality can be achieved with the collaboration of top management to lower levels of the organization.

Moreover, in 2014, Oakland stated that TQM cannot be restricted to production or operations areas. Therefore, this study is undertaken to determine the expressive effect of its practices in the mineral sector of Pakistan. It can be defined "as a management approach aiming at long term success through continuous improvement, with the collaboration of every member of the staff, to meet the requirements of customers". Numerous authors like (Oakland, 2014; Chen & Chen, 2009; Li, Markowski, Xu, & Markowski, 2008; Cua, McKone, & Schroeder, 2001) have defined TQM in their own shades of concept but above all with similarities.

This indicates that developed countries introduced TQM and its practices to enhance the performance with the collaboration of every staff of the member. Whereas, founding fathers of quality shared different ideas, but importantly they agreed it could be achieved with the group effort of senior management to the lower level of the staff. Mix definition has been witnessed by different authors, but with similarities, and with a common aim to satisfy the customers, enhances productivity through continuous improvement.

Next, a number of researchers caught inspired by the success of TQM practices in different sectors like banking, manufacturing, services, education, textile etc. They decided to carry out research in mining/mineral sector like in 2014, Mohammad Jafari conducted research in mining industry of Iran. Likewise, Boateng - Okrah & Appiah Fening (2012) ascertains its implementation in mining company in Ghana. Moreover, Oguejiofor, (2009) used it as a tool in the Nigerian Coal Corporation. In 1999, Jackdell Stephen Mallo assessed how it can invigorate Federal/Provincial government, and the private investors towards achieving their objectives and goals. He recommended that, Federal/Provincial government must provide quality, transparent, and unambiguous mineral policy through which foreign investors could be motivated, as well as must be staffed with highly qualified members to train and re-train other member's about TQM. Similarly, Swiss (2014) highlighted it can

make a useful contribution to contemporary public management; if it is introduced without overselling, and with sensitivity to government's unique circumstances.

Furthermore, developing countries like Pakistan seem geared up to be in a league. Problem in Pakistan is "Everybody wants to go to heaven, but no one wants to die". (Prof Henry M. Bwisa, Nov, 2008). Number of studies have been conducted regarding TQM in different sectors of Pakistan like education, construction, textile, telecommunication, health, manufacturing and other business organizations (Tariq et al., 2016; Suleman & Gul, 2015; Arslan & Zaman, 2014; Nawaz & Ikram, 2013; Irfan, Ijaz, Kee, & Awan, 2012; Shahab Alam Malik, 2013; Malik, Malik, & Zia-ur-Rehman, 2013; Hasan, Sohail, Piracha, & Ahmad, 2013; Hassan, Mukhtar, Qureshi, & Sharif, 2012; Subhan, 2012; Irfan et al., 2012; Ismail, Khurram, & Jafri, 2011; Raja, Bodla, & Malik, 2011; Sajjad & Amjad, 2011; Muhammad Asif, 2011; Shafiq, 2011; S. A. Malik,muhammad, Iqbal, Shaukat, & Yong, 2010; Kureshi, Qureshi, & Sajid, 2010; Khan, 2010) but literature gives rare empirical evidence about implementation of TQM on mineral resources development in Pakistan. Likewise, two national mineral policies (NMP-1,1995; NMP-2, 2013) have been formulated by the government of Pakistan. Cleary police showed hunger and craving to achieve objectives which bridge towards development in the mineral sector because mineral resources are being considered bedrock of any country and contributions are on the higher side with respect to the economy. Undoubtedly, Pakistan is gifted with momentous mineral reserves.

Similarly, Pakhtunkhwa Policy (2014) has been formulated under the visionary leadership of Chair Imran Khan, and guidance of the Chief Minister Pervez Khattak to in line with indigenous demands and market conditions. Furthermore, KP is being preferred as a study area since, tremendous amount of natural minerals lays under the belt of its territory for instance soapstone, dolomite, gemstones, gold, copper, coal, gypsum, marble, chromium, salt, limestone, silver and pyrite. Along this, these minerals are of highly worth in terms of benefits; usages of these minerals are in industry, in our homes and play a vital role to increase the Gross Domestic Product (GDP) of a country.

Literature depicts studies have been carried out in different sectors in Pakistan, but limited comprehensive empirical studies available in the existing literature of TQM in the context of mineral sector. Whereas, mineral policies showed the government is highly motivated towards development in this sector. Thus, this study aims to invigorate the role of government, investors, and its effect on mineral resources development. This study also aims to identify the main barriers faced by the mineral sector while implementing quality initiatives.

Research questions of the study:

- Do the TQM practices create significant effects on mineral resource development?
- Does the Federal/Provincial government play any role in the implementation of TQM practices on mineral resource development?
- Do investors play any role in the implementation of TQM practices on mineral resource development?
- What are the main barriers faced by the mineral sector of Pakistan while implementing the TQM?

The objectives of the study are to:

- To determine the significant effect of TQM practices on mineral resources development.
- To analyze the significant role of moderator (Federal/Provincial) government between TQM practices and mineral resources development.
- To analyze significant role of moderator (investors) between TQM practices and mineral resources development.
- To indentify the main barriers faced by the mineral sector of Pakistan while implementing TQM.

Literature Review

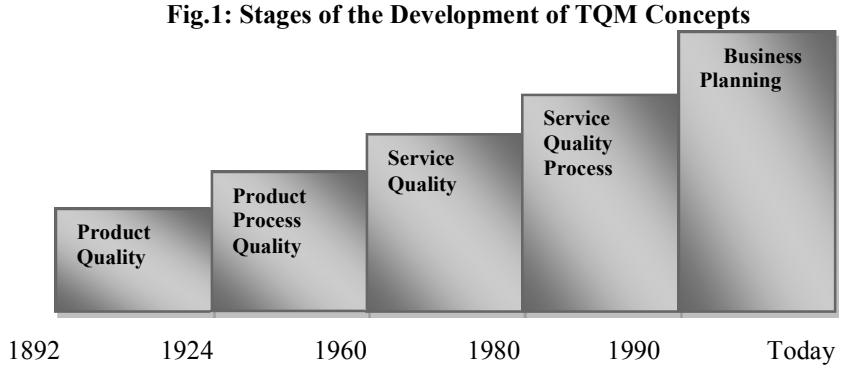
Total Quality Management

Total Quality Management (TQM) is about long term success, productivity, efficiency and adopting the attitude in which every member of the staff contributes to continuous improvement, it is all about pouring out fear and breach downward barriers (Abdulazeez & State, 2016). It is the comprehensive approach for improving strength, competitiveness, and flexibility through planning, understanding, and organizing each activity, and involving every member of the staff at each level. As part of this, it is beneficial to any types of organizations (Oakland, 2014). In 2007, Barrier G. Dale stated that TQM requires that quality management principles be supposed to apply at every level, and every branch of the organization with the involvement of employees and keeping in mind the needs of customers, put simply TQM act as both philosophy, and a deposit of guiding principles for managing an organization to the profit of all stakeholders.

Linguistically, word "Quality" arose from "Latin" which means "quails" literal meaning "what kind of" or "such as the thing really is". As part of this, it has variety of meaning and implies lots of effects to dissimilar people (Sherr & Gregory Lozier, 2015; Barrier G.Dale, 2007). Juran & Godfrey (1998) pointed out, TQM evolved from side to side in different steps, which consist of focal point on integrated strategic quality planning, strategic quality planning, product quality, product process quality, service quality, business planning and service

process quality.

Fig.1: Stages of the Development of TQM Concepts



Source: (Shafiq, 2011 ; Juran & Godfrey, 1998.p.14.16)

Moreover, division of TQM evolution consists of four phases or four fairly discrete stages 1) Inspection 2) Quality Control 3) Quality Assurance 4) Total Quality Management (TQM).

TQM Practices

Before an organization can rip the benefit from TQM implementation, some practices would need to be enshrined into the organization's culture (Oluseun, 2008). According to Hung, Lien, Yang, Wu, & Kuo (2011) TQM focuses on top management, customer satisfaction, employee involvement, and continuous improvement. This study uses, and discusses the main and most common practices of TQM in the current study.

Top Management

According to Suleman & Gul (2015) top management play a vital role in implementing TQM since it ensures better performance through influencing employees within an organization, he also stressed the fact that lack of top management commitment drives the organization to unsuccessful implementation of TQM. Ashref Abdelsalam Ali Elfaituri A (2012) highlight that major determinant of successful quality management implementation is by top management. In the existing literature most important thing suggested about the effective implementation of TQM is top management's leadership (Shafiq, 2011).

Customer Satisfaction

Ross (1995) highlighted *"Quality begins and ends with customer" as* cited in Ashref Abdelsalam Ali Elfaituri A (2012). Importantly, satisfaction of customers can be carried out by the commencement of top management (Kim, Kumar, & Kumar, 2012). Further, customer satisfaction must be planned into the whole system as the quality cannot be inspected into products or services (Oakland, 2014). On the other hand, mostly organization does not focus on customer satisfaction as much as they focus on their products, and services. Whereas, some countries namely Pakistan does not charge organizations for their poor performance, in some cases, this leads to customers misery (Norah Dhafer Al-Qahtani, 2015). For long-term organizational success customer satisfaction is considered to be an important requirement. This satisfaction requires the entire organization to be focused on customers needs (Dean & Bowen, 1994).

Employee Involvement

Employee involvement is consider to be critical elements of a good performance measurement and with TQM it is a process for empowering the employees to take part in daily decision making and improvement activities which are worthy for organization performance (Sherr & Gregory Lozier, 2015; Oakland, 2014). Moreover, (Arslan & Zaman, 2014) highlighted that leadership and employee involvement are the most commonly used practices of TQM, which he emerged from seven different studies during the literature review. Furthermore, designing products, managing processes, and dealing with quality data are the efforts play in employee involvement in quality implementation and they will favor the new organizational methods, models, and slot in new strategies for the organization. Employee involvement is beneficial since they are closer to problem or opportunity that makes them in a best position to participate in decisions and improvement activities (Akgün, 2014; Kim, Kumar, & Kumar, 2012; Ashref Abdelsalam Ali Elfaituri A, 2012). In contrary, point made by researchers like (Fuentes-Fuentes, Lloréns-Montes, & Albacete-Sáez, 2007; Hope & Mühlemann, 2001) in an environment where wage costs have grown, less employee involvement is also recorded on the lower level, and rewards are more related to employee performance.

Continuous Improvement

Continuous improvement is endeavouring to achieve performance through addition of innovations in organizational processes (Bart, Boynton, 2000). According to Sherr & Gregory Lozier (2015) people, equipment, materials, suppliers, and producers are involved in the process of continuous improvement. In fact, TQM is concern with continuous improvement in all production process, from the very beginning phase of planning, and decision making until the execution phase, idea behind the continuous improvement is to avoid mistakes and to prevent defects (Oluwatoyin & Oluseun, 2014). Molina-Azorín (2009) makes the point that continuous

improvement of processes, and product quality is the path which leads to increase in revenues and reduction in costs. Importantly, Kumar (2005) spotlight on fact that employees must be educated to identify the opportunities for continuous improvement.

TQM and Performance

Numerous authors (O'Neill, Sohal, & Teng, 2016;Respati & Amin, 2014;christopher d. zatzick, 2012; Zhang, Linderman, & Schroeder, 2012;Li et al., 2008;Rahman & Bullock, 2005;Cua et al., 2001) have done their work on manufactruing firms to enhance its performance. Moreover, Maletič, Maletič, & Gomišček (2014) highlighted that the quality management orientation is an important predictor of maintenance performance, as well as quality management dimensions are positively related to maintenance performance. As part of this, strong foundation of quality management is the best route to improving performance. On the other hand Calvo-Mora (2013) stated TQM social factors (Top Management, focus on stakeholders etc) do have direct and significant impact on the effectiveness of the quality system as well as so do the technical factors (use of analysis, measurement problem-solving tools etc). Likewise, Rahman & Bullock (2005) demonstrates that hard elements of TQM (e.g. Process management) have a direct effect on organizational performance whereas soft elements (e.g. Leadership and People management) affect performance indirectly through hard TQM elements. In contrary, Kaynak (2003) pointed out that a relationship exists between the extent to which companies implement TQM and organization performance. Evaluation of top management's leadership is essential when the effectiveness of TQM is investigated. Taylor & Wright (2003) emphasised that top management must understand the nature and purpose of the TQM, its connection to ISO9000, and the probable benefits that can build up from its implementation. They also highlight the fact that top management should take charge of TQM, and ensure that maximum number of employees are involved in its implementation in order to drive success from it. In opposed, Rungtusanatham, Ogden, & Wu (2003) draw attention to as a community of scholars, to take up the challenges so that scholars can continue to advance theory development in TQM. Or else, the risk of relegating TQM to yet another fad whose time has passed.

Furthermore, Linderman (2004) argues that quality management creates knowledge, which lead the organization towards performance. Douglas & Judge Jr (1999) supported that there is a strong relationship between TQM practices, and organizational performance along this also support for the moderating influence of organizational structure on TQM implementation effectiveness. Next, Irani (2004) discussed that organizational culture play an important role in the successful implementation of TQM and its aspects (e.g customer satisfaction, top management, teamwork, continuous improvement) and, relationship exists between TQM and corporate culture.

TQM in Pakistan

Drastic changes around the globe in terms of business, and persistent outcomes of TQM practices provided by different authors, researchers from developed countries, and developing countries encouraged Pakistan to experiment, and inculcate the culture that would change the performance. Therefore, considerable amount of researchers carried out studies with TQM practices to investigate, and to explore its impact in different sectors of Pakistan.

Like (Suleman & Gul, 2015; Arslan & Zaman, 2014) have conducted research in education sector of Pakistan. Moreover (Shahab Alam Malik, 2013;Hassan et al., 2012; Subhan, 2012;Raja et al., 2011) carried out research in manufacturing sector. Whereas (Irfan et al., 2012;Ismail et al., 2011) done their research in hospitals. Furthermore (Irfan et al., 2012; Shafiq, 2011) have conducted research in textile sector. Numerous other researchers (Tariq et al., 2016;Norah Dhafer Al-Qahtani, Sabah Sa'ad Alshehri, 2015; Nawaz & Ikram, 2013;N. A. Malik et al., 2013; Irfan et al., 2012; Sajjad & Amjad, 2011) have explored the impact of TQM practices in different sectors of Pakistan with different objectives. However, limited research has been done in mineral sector of Pakistan; therefore this study is carried out to determine the significant effects of TQM in mineral sector.

Impact of Minerals

Minerals are considered as a backbone of the economy of any country, and play a significant role in the industrial and monetary advancement of the country. Therefore several researcher emphases on its importance on economic growth like Saadat (2016) pinpointed that Pakistan is recognized to have plentiful minerals resources but unfortunately their contribution in the financial system has not been explored significantly up till now. Likewise, Sarwar & Rahman, (2016) reported that mining assumes an indispensable part in the improvement of the country by giving businesses, by enhancing the personal satisfaction of the masses, and upgrading the framework by giving streets and making exchange great for the place. Furthermore, Pakistan can be unspoken to be a heaven for mineral resources, but its contribution to the GDP of the nation is very minute. The reason might be; lack of management and foreign investment in the country, improper monitoring and evaluation, insufficient tax compliance, political instability etc (Sohail, Huang, Bailey, Akhtar, & Talib, 2013). Pakistan is gifted with rich mineral resources, but due to mismanagement, lack of resources etc this sector is not contributing to GDP of the nation as it desired to contribute.

Role of Government

In every sector, government has to play an imperative role for the sake of development of a country. Therefore, government of Pakistan took initiatives, and first National mineral policy has been formulated in 1995 with the consensus of all the federating units named as NMP-1 presenting suitable institutional planning at federal and provincial levels; timely bound investment friendly regulatory regime, and globally competitive economic incentives. The broad goal is to increase the involvement of the mineral sector to the GDP by competent and maintainable improvement of mineral assets through mystery area speculation for the advantage of the general population of Pakistan with a specific end goal to achieve this objective. In order to reach this goal, after 18 years another national mineral policy came into existence in 2013 named as NMP-2. Likewise, government of KP took initiative and formulated KP mineral policy (2014). Undoubtedly, this policy is intended to guarantee that mineral sector development takes advantage of initiatives and coordinated effort at regional, national, and international levels that guarantee best practices and good governance for accelerated growth and development. Moreover, all three policies NMP-1 and 2, KP mineral policy have same objectives in common, to encourage international and national investors, to provide a sustainable environment, and both government bodies work collaboratively for the development of this sector.

Despite, mining segment at present contributes less than 1% to Pakistan's GDP however it can be raised to 10% to twenty percent in next ten years, which would be noteworthy for the financial advancement of the nation (Sohail et al., 2013).

TQM on Mineral Resources

Like other sectors TQM took place in mineral/mining sector as well like, few researchers namely Mohammadjafari (2014) conducted research in Golgohar mining and industrial company, Iran. They concluded that its implementation requires a complete change in the organization, particularly in terms of performance, organizational culture and its structure. Furthermore, Boateng‐Okrah & Appiah Fening (2012) determined the level at which TQM practices have been executed in a mining organization in Ghana. In this study, they came to realize that the organization has gone through the early stage of the TQM training of top and middle level management and are now at the point of transferring the knowledge to the rest of the employees in the company. In 2009, Oguejiofor attempted to entrench the TQM paradigm into the coal corporation in Nigeria. In this study, he said that specialized and authoritative issues of the coal company are required to be handled by TQM world view. Similarly, jackdell stephen mallo (1999) identified TQM as new management philosophy as the most important management technique capable of drastically minimizing or eliminating such impediments associated with mineral investment in Nigeria such as poor funding, unfavorable government policy/implementation, inadequate technological transfer, inadequate technological development, inadequate infrastructure development and low capacity utilization of mining/mineral processing industries. Moreover, his study also shows its competitive advantages in mineral sector like Quality Mineral Policy, Quality Employment, Quality Services, Quality Exploration/mineral development, Quality Mining/Mineral processing of products. As part of this, his findings also shows that how the entire mineral sector comprising the Federal Ministry of Solid Mineral Development, Federal Government Parastatals, and the organized private sector of mineral investment can implement the tools, techniques and project of TQM.

Clearly, research has been made on mineral/mining in different countries and indicated importance of TQM in this sector. Problems can be tackled through this paradigm. Therefore, this study has been undertaken in the mineral sector of Pakistan.

Framework

On the basis of extensive literature review number of researchers (O'Neill et al., 2016;DR.Majd Mohammad al-omoush, 2015; Respati & Amin, 2014; Maletič et al., 2014) adopted TQM and its practices to enhance the organizational performance, innovativeness, learning capabilities etc, their results showed a significant positive relationship between TQM practices and organizational performance. Similarly, researchers in Pakistan (Tariq, Asim, Javid, Bashir, & Awais, 2016; Suleman & Gul, 2015; Norah Dhafer Al-Qahtani, Sabah Sa'ad Alshehri, 2015; Arslan & Zaman, 2014; Nawaz & Ikram, 2013; Shafiq, 2011) conducted research in different sectors like Banking, Construction, Textile, and in Education. Their findings showed that there is a significant positive relationship between TQM practices and business results. However, the definition of TQM, contribution of pros and different findings of researchers in developed and developing countries, along with in depth review of literature motivates this study to adopt TQM practices.

Likewise, (Mohammadjafari, 2014;Boateng‐Okrah & Appiah Fening, 2012; Oguejiofor, 2009; jackdell stephen mallo,1999) adopted TQM in the mineral/mining sector, their findings revealed that TQM as the most important management technique capable of drastically minimizing or eliminating such impediments associated in the mineral/mining sector. Therefore, this study adopted TQM practices to determine their significant effect on mineral resources development.

Research model shows relationship between the independent variable TQM with its indicators (Top Management, Customer Satisfaction, Employee Involvement, and Continuous Improvement) and dependent

variable Mineral Resources Development with its indicators (quality service, quality mineral policy, quality mineral product) and moderating variables (Government and Investors).
On the bases of the above discussion, following model is proposed in figure as mentioned in section research model.

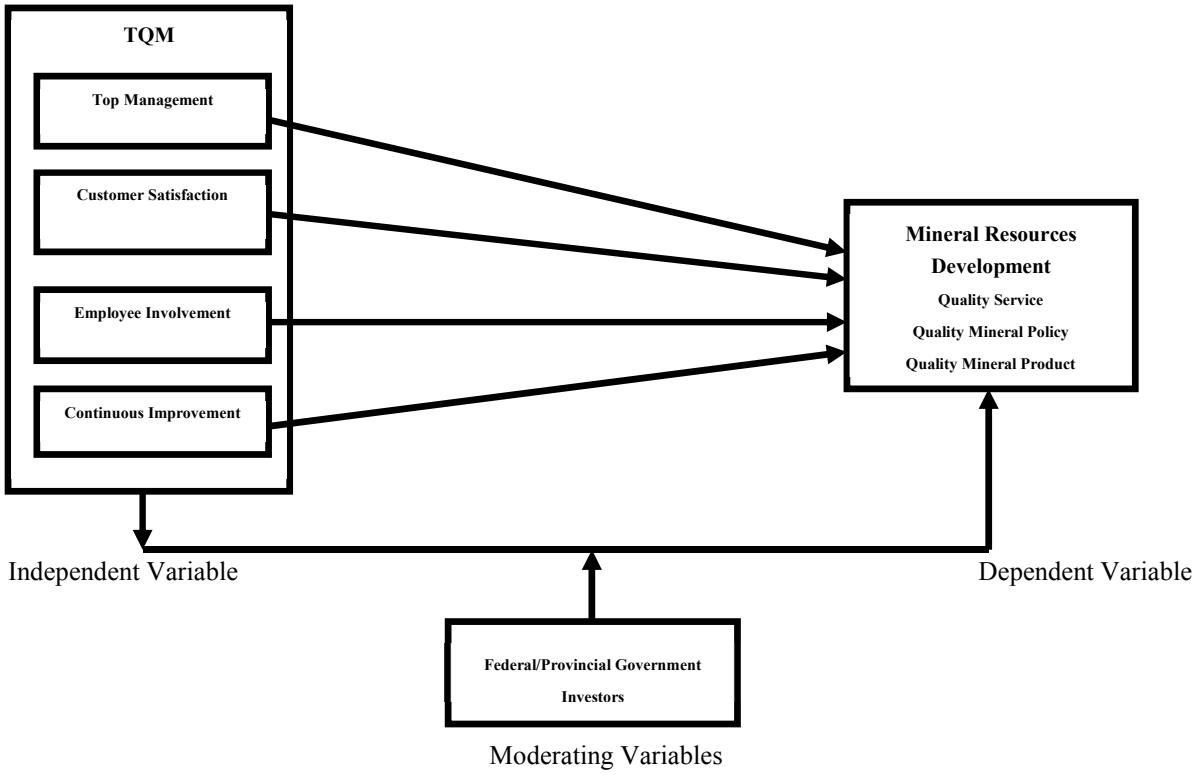


Fig.2: Research Model

Hypotheses

In order to meet the prime objectives of the study, hypotheses for the current study are developed.

H1: TQM has a significantly positive impact on MRD
H1a: Top Management Leadership has a significant impact on MRD.
H1b: Customer satisfaction has a significant impact on MRD.
H1c: Employee Involvement has a significant impact on MRD.
H1d: Continuous Improvement has a significant impact on MRD.
H2: Federal and Provincial Govt moderate the relationship between TQM indicators and MRD.
H3: Investors (National and International) moderates the relationship between TQM indicators and MRD.

Research Methodology

Structured review for the literature write-up is adopted; key words are used to find relevant articles i.e. Total Quality Management, Total Quality Management Practices, TQM and Organization Performance, TQM and Manufacturing Industries, and TQM in Mineral/Mining Sector etc. Moreover, the Association of Business Schools (2010, 2015) and impact factor of the journal has been set as parameter to select quality journals for this study. A total of 124 articles are selected out of which 82 articles are ranked four-grade (4*) and three-grade (3*) in ABS as showed in Figure 2.1(see Appendix-I). A total of 82 articles, published in 28 journals falling under the 7 subject categories i.e. international business and area studies, psychology (organizational), economics, econometrics and statistics, organization studies, operation research and management sciences, operation and technology management, information management. Furthermore, rests of the 36 articles are chosen on the basis of their journal impact factor. Articles published in 32 different journals falling under the categories i.e. journal of resources development and management, journal of education and practice, European journal of business and management etc. Key words used to explore and to select relevant articles i.e. mineral resources, economic growth, economic impact, development, natural resources, mining, etc as showed in Figure 2.2 (see Appendix-I).

Research Design

Current study is both descriptive and casual in nature, therefore the survey strategy has been adopted, along with a questionnaire as a tool for collecting data used to complete the survey.

Data Source

Primary data have been used in this study for analysis and its been gathered from different groups of people in the mineral sector through a questionnaire.

Questionnaire

The study used questionnaire as a tool for data collection from three different studies. Constructs adapted for using these studies are (TQM indicators such as Top management, Customer satisfaction, Employee involvement, Continuous Improvement as an independent variables, whereas, Mineral Resources Development with its indicators such as Quality Policy, Quality Product and Service as dependent variables). Survey strategy has been conducted in order to collect data from concern entities like (Mines workers, Lease owners, Mining Engineers, Geologists, Assistant Managers, Assistant Director, General Managers, Technical Advisors etc) as well as from main stakeholders like Pakistan Mineral Development Corporation (PMDC), Directorate General of Mines and Minerals, Hazara Division, Abbottabad (DGMM), and also from SNL financial named one of the fastest growing 2015 private company deals with several products including metals and mines. Furthermore, some questionnaires have been sent via-email using Google.doc, and some have been handed directly to the research respondents. Furthermore, both close ended and open ended questions have been used. Some open ended questions like using word “others” and “list down” have been used in current study to dig more information out from the respondents, which might be helpful in making future directions. While in close ended questions 5 point likert scale have been used i.e. strongly disagree, disagree, neutral, agree, and strongly agree.

Study Population

The population studied in this study covers three main organizations (PMDC, DGMM, and SNL), and 113 registered mines listed in the record of Directorate General Mines and Minerals Hazara Division, Abbottabad. All mines are presently active in Abbottabad District and Haripur District. Mines data in hard form have been gathered from Directorate General Mines and Minerals Hazara Division, Abbottabad.

Sample Size and Technique

It lies under the shade of probability sampling, and suited to attain the aims of the current study because all the mines are scattered in Abbottabad and Haripur district. Consequently, required sample has been drawn out using Krejcie & Morgan's (1970) table from the entire population due to time, financial, and human resources constraints. He recommended 89 sample size are required for the given population with the level of confidence 95%, and 0.05 degrees of accuracy/margin error. Which includes 86 mines, and three organizations, all the mines are registered and working under the DGMM.

Data Analysis

Demographic profile of respondents

The findings reveal that in the sample for the study males (98.3%) outnumbered females (1.7%) since typically females are not expected to work in the mineral sector while most of the work in the mineral sector is devoted to the field. Likewise (69.0%) of research respondents’ age from 20 to 30, the majority of the respondents (31.7%) have been mine workers, (15.3%) mining engineers, (13.7%) managers respectively. Whereas (83.0%) experienced in between 1 to 10 years and (42.7%) reported against the high school or equivalent degree as mentioned the majority of respondents have been mine workers, as expected mine workers are not well educated, whereas (39.3%) of the respondents having masters/m. Phil degree shows that a large number of research respondents are highly qualified which seemingly is good for mineral resources development. This shows that the research respondents have a good enough experience and knowledge which enabled them to judge the level of quality management in their organizations/mines.

Table 1: Demographic Profiles of the Respondents

Profile	Response	Category	Frequency	Percentage
Gender	300	Male	295	98.3
		Female	5	1.7
Age	300	20-30	207	69.0
		31-40	66	22.0
		41-50	17	5.7
		Over 51	10	3.3
Position	300	Director	2	0.7
		Assistant Manager	10	3.3
		Manager	41	13.7
		Technical Advisor	26	8.7
		Lease Owner	11	3.7
		Seniors Clerk	23	7.7
		Mine Sirder	22	7.3
		Geologist	24	8.0
		Mining Engineer	46	15.3
		Mine worker	95	31.7
Experience	300	1-10	249	83.0
		11-15	23	7.7
		16-20	16	5.3
		21-25	4	1.3
		26-30	3	1.0
		More than 30	5	1.7
Employee. No	300	Less than 25	237	79.0
		25-100	24	8.0
		More than 100	39	13.0
Qualification	300	High School or Equivalent	128	42.7
		Bachelor Degree	54	18.0
		Master/M.Phil Degree	118	39.3
Organization	300	Public Sector	25	8.3
		Private	253	84.3
		Semi-Government	22	7.3

Reliability Analysis

Table 2 represents the evaluated values of Cronbach's coefficient alpha to look at the reliability and internal consistency of the measures. For the present specimen, the estimations of Cronbach's alpha vary from 0.644 to 0.900 which shows that the items form a scale that has reasonable internal consistency reliability. TQM practices (alpha = 0.900), Mineral Resources Development (alpha = 0.723), Federal and Provincial Government (alpha = 0.692) and Investors (alpha =.674).

Table.2: Reliability of measurement

Constructs		Valid N	Number of Items	Cronbach's Alpha
Total Quality Management		300	16	.900
	Top Management Leadership	300	04	.644
	Customer Satisfaction	300	04	.741
	Employee Involvement	300	04	.666
	Continuous Improvement	300	04	.862
Mineral Resources Development		300	06	.723
Federal and Provincial Government		300	03	.692
Investors		300	02	.674

Correlation Analysis

Table 3 shows the correlation between the variables. Overall TQM is positively correlated with MRD with a value of (0.798), whereas practices such as TM is positively correlated with MRD (Dep) with a value of (0.616); CS is positively correlated with high MRD (0.831), likewise EI is positively correlated with MRD (0.640) and CI is also positively correlated with MRD (0.608).

Table.3: Correlation Analysis

		TQM	TM	CS	EI	CI	MRD
TQM	Pearson Correlation	1					
	Sig. (2-tailed)						
TM	Pearson Correlation	.873**	1				
	Sig. (2-tailed)	.000					
CS	Pearson Correlation	.811**	.623**	1			
	Sig. (2-tailed)	.000	.000				
EI	Pearson Correlation	.858**	.774**	.516**	1		
	Sig. (2-tailed)	.000	.000	.000			
CI	Pearson Correlation	.844**	.591**	.588**	.644**	1	
	Sig. (2-tailed)	.000	.000	.000	.000		
MRD	Pearson Correlation	.798**	.616**	.831**	.640**	.608**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	300	300	300	300	300	300

**. Correlation is significant at the 0.01 level (2-tailed).

Regression Analysis

Regression analysis has been used to determine the significant effect of TQM practices on Mineral Resources Development as shown in table 5.7, which explains that 63.7% of variation of MRD is because of TQM, similarly table shows that TM value of R^2= .377, (P<0.001) means 37.7% of variation in MRD because of TM, CS value of R^2= .690, (P<0.001) and EI value of R^2= .410, (P<0.001) means 69.0% of variation because of CS whereas 41.0 % of variation because of EI in MRD and CI value of R^2= .370, (P<0.001) means 37.0% of variation because of EI in MRD. Adjusted R^2 supposes to be same as the values of R^2 or close to its value; values of adjusted R^2 are very close to it as showed in the table. Likewise, F statistic values indicate that how the independent variables jointly affect the dependent variable, and its values should be greater than (P<0.001) as values have been demonstrated in the table respectively. Whereas the beta's value β =.820 are also a significant level. To sum up on the basis of results shown in table H1 and its sub hypothesis H1a, b, c, and d are accepted.

Table.4: Regression Analysis

Model	IV	DV	R^2	Adj R^2	F *stat*	β	Sig
H1	TQM	MRD	.637	.636	523.170	.820	.000
H1a	TM	MRD	.379	.377	181.800	.572	.000
H1b	CS	MRD	.690	.689	664.455	.700	.000
H1c	EI	MRD	.410	.408	207.035	.590	.000
H1d	CI	MRD	.370	.368	175.124	.485	.000

***p<. 05, **p<. 01, ***p<. 001**

Moderation Analysis (Government Model 1)

Moderation analysis has been used with the help of Baron & Kenny (1986) method, using path diagram to analyze the significant role of moderator Federal and Provincial Govt between TQM practices and mineral resources development as showed in table 5. Moderation analysis table demonstrates the value of R^2=.655, (P<0.001) which explains that 65.3% of the variation on MRD is because of moderation (TQM*Mod1), similarly *F*=15.398, explains that the (TQM*Mod1) has an effect on MRD. Whereas the beta's value β = -.120 shows that there is the significant negative role of government, and its significant value is (*sig* = .000). On the basis of results shown in the table H2 has been accepted.

Table.5: Moderation analysis (Government Model 1)

Model	Moderation	DV	R^2	Adj R^2	F *stat*	β	Sig
Govt(mod1)	TQM*Mod1	MRD	.655	.653	15.398	-.120	.000

***p<. 05, **p<. 01, ***p<. 001**

Moderation Analysis (Investor Model 2)

Same method has been applied to analyze the significant role of Investors (National and International) between TQM practices and mineral resources development as showed in table 6. Moderation analysis table demonstrates the value of R^2=.660, (P<0.001) which explains that 65.7% of the variation on MRD is because of moderation (TQM*Mod2), similarly *F*=4.651, explains that the (TQM*Mod2) has an effect on MRD. Whereas the beta's value β = .057 that there is a low significant positive role of investors, and its significant value is (*sig* = .032). On the basis of results shown in the table H3 has been accepted.

Table.6: Moderation analyses (Investor Model 2)

Model	Moderation	DV	R^2	Adj R^2	F *stat*	β	Sig
Invt.(mod2)	TQM*Mod2	MRD	.660	.657	4.651	.057	.032

p<. 05,**p<. 01,p<. 001**

Barriers

The final section of the questionnaire has been devoted to barriers. Moreover, descriptive statistic has been applied to display the results. Table 7 shows whether investigate respondents consider hindrances as an issue or not.

Table.7: Summary of Barriers

Barrier	No Barrier	Weak Barrier	A Barrier	Strong Barrier	%
B1: Lack of top management commitment	17.0%	23.3%	32.7%	27.0%	28.3%
B2: Lack of resources	7.0%	17.3%	52.7%	22.7%	31.8%
B3: Managers don't have adequate knowledge of Total quality management TQM implementation	4.0%	17.3%	56.3%	22.3%	32.8%
B4: Lack of communication	1.0%	15.0%	54.3%	29.7%	35.5%
B5: Organizational emphasis on short-term profits rather than long-term gains	3.0%	12.7%	48.0%	36.3%	36.3%
B6: There is a lack of understandings of the benefits of Total quality management TQM.	1.3%	14.7%	48.3%	35.7%	36.4%
B7: Lack of a motivation and reward system	3.3%	13.7%	44.7%	38.3%	36.3%

Discussion of Findings

Primary goal of the study is to determine the significant effect of TQM practices on mineral resources development. The findings of the study indicate that there is a strong positive correlation between TQM and MRD ($r=0.79$, $p < 0.01$), and all selected practices have a strong positive correlation, while none is negative. Among other practices, customer satisfaction shows a strongest positive high correlation with MRD ($r=0.83$, $p < 0.01$). This shows the customer satisfaction dimension of TQM is more in contention when it comes to the development of the mineral resources.

Moreover, regression analysis shows that there is a significant positive impact of TQM practices in MRD in terms of quality service, quality mineral policy, and quality mineral product. This means more focused would be on TQM practices to establish growth in the mineral sector. This result concurs with the findings of Mohammadjafari (2014). They detailed that TQM usage requires a total change in the organization, especially in terms of performance, organizational structure and organizational culture in the mining and industrial organization. The review additionally underpins the discoveries of Boateng - Okrah & Appiah Fening (2012). They highlighted that the top administration must keep on accepting the duty of responsibility to quality approaches that arrangement with the mining organization for quality and fulfillments of clients' needs. The findings of the study also concur with the findings of Oguejiofor (2009). They announced that TQM worldview is expected to handle specialized and managerial issues of the Nigerian Coal Corporation. Correspondingly, the study is likewise in accordance with the findings of Jackdell Stephen Mallo (1999). He stated that TQM philosophy can lead to achieving corporate excellence in both services and wares in the solid minerals sector of the Nigerian economy.

The findings of the study concur with the discoveries of different studies (Irfan et al., 2012; Hassan et al., 2012;Subhan, 2012; Irfan et al., 2012;Sajjad & Amjad, 2011;Muhammad Asif, 2011; Shafiq, 2011;S. A. Malik et al., 2010) conducted in Pakistan and across the border in the context of organizational performance.

The second objective of the study is to identify the key barriers faced by the mineral sector while implementing quality initiatives. The findings indicate that there are major barriers which hinder the successful implementation of TQM. (31.8%) of the research respondents reported lack of resources, (32.8%) said manager's don't have adequate knowledge about the implementation of TQM, and (35.5%) indicate lack of communication between top management and employees, whereas, (28.3%) said lack of top management commitment, (36.3%) reported organization focus on short term profits rather than long term gain, (36.3%) lack of motivation and reward systems, and (32.8%) said managers do not understand the benefits of TQM. This study supports the findings of many previous studies due to cultural similarities carried out in different sector of Pakistan. For example the findings of the study concur with the findings of Suleman & Gul, (2015). They found similar issues faced by the schools, while implementing TQM. Based on their results, they strongly recommended that all the educational institutions should be bound by the competent authorities to adopt the paradigm of TQM. Similarly, this study corroborates the findings of (Shahab Alam Malik, 2013; Nawaz & Ikram, 2013;Shafiq, 2011).

Further, third objective of the study is to analyze the significant role of moderator Federal/Provincial

government between TQM practices and mineral resources development. The findings show significant negative moderation of government among its practices and MRD. This may be due to lack of resources which includes e.g. The capacity of the building, deficiency of knowledge, development of tools, training, lack of communication between top management and employees etc. Lack of the resources are the major impediments in the development of the mineral resources, number of previous studies indicated lack of the resources are potent barrier, therefore findings of the study concur the findings of (Shahab Alam Malik, 2013; Nawaz & Ikram, 2013) . Likewise, the findings of the study corroborate the findings of (Sarwar & Rahman, 2016; Sohail et al., 2013; Boachie, 2012; Oguejiofor, 2009; Bachh, 2003; jackdell stephen mallo, 1999) Fourth objective of the study is to analyze significant role of moderator investors between TQM practices and mineral resources development. The outcomes of the study showed, significant low positive moderation of investors between TQM practices and MRD. The results show low positive moderation. Cause might be barriers as discussed earlier. The findings of the study concur with the findings of Saadat, (2016). She indicated that gross domestic investment shows the negative contribution, and it may be preferable to a less degree of investment than the required layer of investment on mineral resources of Pakistan, and she reasoned that there is demand to investigate the tie-up between the mineral resources and economic development and also look into the reason behind negative relationship. The findings of the study are consistent with the (Sarwar & Rahman, 2016;O.M, 2014;Sohail et al., 2013; jackdell stephen mallo, 1999) .

Implications

This is among the far reaching studies about the impact of TQM with regards to the Pakistani mineral sector. This study contributes into the assortment of TQM learning by giving new empirical evidence from Pakistan, which is an under looked into creating nation. Therefore, implications have been allocated into three categories e.g. Academic, Managerial, and Policy.

Limitation

This study has made various commitments to the literature, yet it keeps a couple of inalienable confinements too. Foremost, is the sample size of the study, generalization of the findings could be improved by enlarging the sample size. Moreover, this study is limited to four core practices of TQM other practices could be studied. The restrictions of time and money related resources speak to limitations for most experts and this review was no exemption.

Recommendations

On the premise of the discoveries the study gives following recommendations for the viable use of TQM practices in the mineral area, and future directions have been placed for further research.

All the mineral/mining organizations (public or private) ought to be bound by the capable specialist to receive the philosophy of TQM at every level. Likewise, a unique group of mentors ought to be named to check the mineral/mining organizations to ensure its implementation. The proper training program regarding its implementation should be introduced so the top management and employees of the mineral sector may be prepared with the cutting edge strategies of TQM usage. As part of this, proper resources should be provided to mineral/mining organizations to promise effective implementation of TQM. Top management and employees play a crucial role in any sector therefore; proficient management and employees/workers should be appointed through proper channel on merit to make its implementation successful. Clients assume a crucial part in the development of mineral resources and in any organizations, proper customer complaints and feedback systems should be placed in organizations. Additionally, sustainable environment with resources should be provided to investors. Moreover, every stakeholder (customer, investor) should be made to be aware of the TQM practices towards attainment of mineral resource objectives. Political interference is sting to overall performance of an organization therefore; political interference should be encountered in order to make successful implementation of TQM.

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Appendix
Appendix-I

Figure 2.1:82 Articles published in 28 Journals, based on ABS

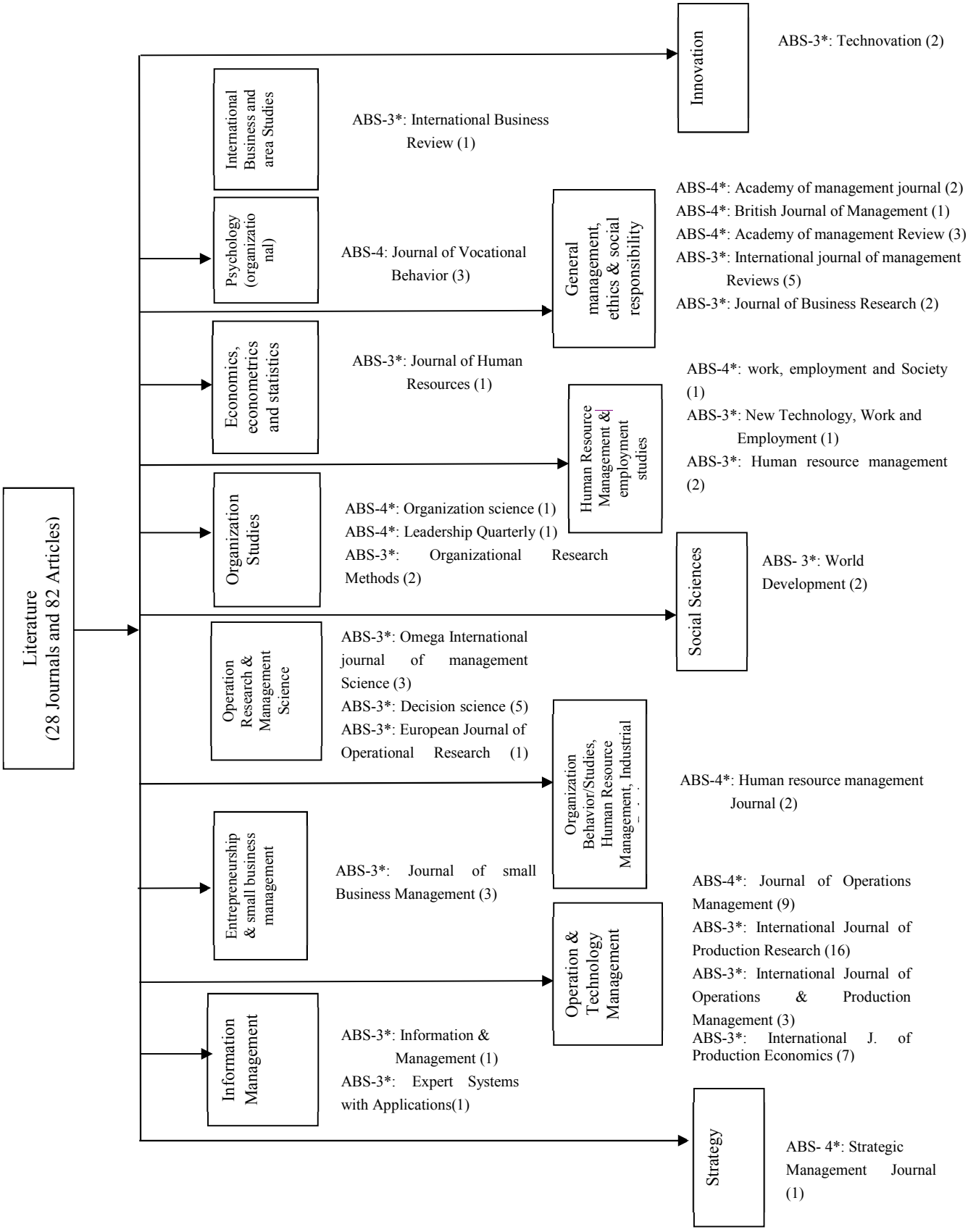

Figure 2.2: 36 Articles published in 32 Journals Based on Impact Factor