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RESEARCH ARTICLE

THE EFFECT OF OPERATING COSTS ON OIL EXTRACTION UNDER UNPROVED RESERVES THE CASE OF MALAYSIAN PETRONAS FIRM -SUDAN

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Abstract

This research aimed to identify the extent to which the operating costs of oil extraction affect all unproved reserves. To reach this aim, the research used the descriptiveanalytical approach. The researchalso used the questionnaire method, as a research instrument, where, (45) questionnaire forms were distributed to a random sample of the employees working at the Malaysian Petronas Firm-Sudan in 2021. Using the Statistical Package for the Social Sciences program SPSS,the research has reached, the fact that modern devices prices are very high, which, cause the firmto incur ahuge amount of money. The research findings have reached,the fact that heavy machineries and equipment need paved roads. The research findings have also shown that the indemnity of the employees and experts causes the firm to incur more burden.The research recommended that oil fields should be guarded by the army in fear of being attacked by the armed movements. The researchalso recommendedthe preparation of maps and geological survey. The research as well, recommended halting the search work for oil during the fall.

Introduction:-

Arab native must have more interest in the research subject of this study, since it has a positive effect on the Arab nation in general, and oil producing Arab countries in particular. This is because our modern civilization is based completely upon communications and dynamics, for which, oil is the blood and soul, whetherin the realm of politics or war or otherwise, in the domain of peace and development. There are certainly many Arab countries, that oil constitutes their sole income. From this viewpoint, theresearchers have focused their attention, with a view to dealing with such accounting aspects, particularly, unproved oil areas, which is a subject that was not being investigated by any researcher.

Oil is a complicated mixture of carbohydrates, meaning that, it is a form of two components, one of which, is the carbon and the other is the hydrogen. Oil may be found in the form of a liquid (petrol) or crude oil. It may also be found in asolid state,which iscalled Kerogen. When, it was foundin gaseous state it is called natural gas, which is mixed with oil in varying degrees, and it may also exist separately from it.

In 1958, the Italian firm Agib won a concession forsearch works and exploration of oil in the red sea coast The firm hadfound some petroleum evidence in that area, before its works were haltedin 1962. In the mid-seventies the American firm Chevron won a wide concession area, including the south of Sudan and Abyei area, in addition to

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Elmuglad basin, which resulted in the exploration of huge oil reserves. This firm, however, quit the area on the pretext of lack of security.Other political aspects between the two countries may have impacted the scene. The result was to close the oil wells with enforced cement, so as not to allow the state- the landowner to easily extract oil. The firm has incurred the burdens of exploration and search works and drilling in consideration ofquitting the area and terminating the contract between the two parties. Until now, the American firm did not returnto continue its oil works in the Sudan.However, there is good news about the coming of American firms to extract oil in the Sudan in the light of freedom peace and justice.

Research Problem

The researcheswhich have been conducted in the fields of oil production in the Sudan on petroleum accounting did not investigate the operating costs of oil production or relate the same to the unproved reserves. To put the research problem statement into effect, the following main research question has been raised:

What is the extent of the effect of operating costs on oil extraction under unproved reserves?

Based on said main research question, the following sub-questions have been developed:

1. What is the effect of purchase of modern and advanced machineries and equipment on oil extraction under unproved reserves?
2. What is the effect of costs of salaries and wages of experts and employees on oil extraction under unproved reserves?
3. What is the effect of the cost of expenses of search works and survey and preparation of maps on oil extraction under unproved reserves?

Research hypotheses

First hypothesis: high purchase costs of modern and advanced machineries and equipment affect oil extraction under unproved reserves.

Second hypothesis: higher salaries and wages of experts and employees affect oil extraction under unproved reserves.

Third hypothesis: the costs andexpenses of search works and exploration affect oil extraction under unproved reserves.

Research Objectives:-

1. The research aimed to identify the reasons behind the lack of realization of large profits by Petronas firm in the Sudan.
2. The research aimed as well, to identify integrated information system about the oil fields in order to provide a clear idea for the management of Petronas in the Sudan.

Research Significance

1. The research acquires its significancethrough its substantial role in the limitation and identification of the problems encountering the extraction of oil and how to solve the same. This is in addition to identify the effect of operating costs on oil extraction under unproved reserves.
2. This research findings may attract the attention of the decision-makers in the Malaysian firm in the Sudan, in order to know more about this research subject and work to apply its findings.
3. The limitation of the attention of other researchers at the national level and their limited knowledge of the subject of operating costs on oil extraction under unproved reserves.

Research Limitation

1. **Spatial limitation**: the research is limited to the Malaysian Petronas firm-Sudan.
2. **Temporal limitation:** the field survey of the research conducted in 2021.

Research Terminology

Oil: it is the oil crude, often found inside the earth, which has many derivatives, such as Benzene, Gasoline, Kerosene, and Natural gas.

Unproved Reserves
These are reserves in case of not proving the existence of oil inside the earth, or that which have no economic feasibility.

Conceptual framework and prior literature
Firstly, Conceptual framework
Concept of oil operating costs:
The concept of costs is one of the significant accounting and economic concepts. Generally, the concept of costs means, economic sacrifices incurred by the economic unit, in consideration ofa service or necessary benefit to achieve its objectives.However, the costs of oil extraction, on the other hand, include the costs of the procedure laid down or required to be laid down to affect the management of oil extraction, in addition to other costs,which include the preparation of maps and civil engineering works, (Abbas, 1968: 12). This is besides, the costs of contract of unproved areas, for instance, the lease premium, fees of brokerage, and registration fees and legal fees, and other actions that relating to the existing contracts, or under-signature contracts. That is to say, those actions, which do not serve a specific contract, but were designed to serve and help in the overall indirect works of the contract sections, for a specific period, which is distributed to all contracts, as per contribution of each contract, and as revenues expenditure that must be charged to the profit and loss account as general expenses, (Ahamed, 1974: 62).

The initial exploration costs, are, in fact, indirect costs, which is an annual expenditure. Contract costs for the all areas, or any part of it, are in this case, capitalized in accordance with the rules of the stock market, (Abu Al-Fotouh, 1977: 23). The researchers hold that the operating costs of oil, are very high, particularly, in the exploration stage. The firm incurs all the implications of oil extraction, particularly, when the extracted

Oil has no economic feasibility. All these high costs incurred by the firm in the hope of oil extraction. The state's landowners, on the other hand, do not incur any expenses. It is the firm which, incurs the expenses of paving the roads and bringing the machineries and equipment of exploration as well as foreign and local experts. This is in addition to incurring the expenses of building the houses, conveying electricity current,and other community services, such as schools, health center, security services. All these expenses were incurred by the firm, which extracts the oil. Definitely, it is a risk of losing much moneyand precious time.

The researchers also see that the entry of small firms into the process of oil exploration is injurious to their financial position, no matter how the firms do for the improvement of their works, since foreign employment, for instance, is of high value, and search for new areas spares no expenses. Moreover,they have to deal with natural barriers such as trees, small water streams and populated villages. All such expenses would be incurred by the firm.

The researchers are in the opinion that that the major problem, which encountering the oil exploration, in case there is no oil in the area, or if any, it is of no economic feasibility.Therefore, such situation may affect the financial position of the firm, in which case, the firm may early quit the area, so as not to encounter difficulties with the experts and employees as well as the expenses of the advanced machineries and equipment. Security issues may also encounter the oil producing firms, which deemed as the most threatening factor to stop the oil exploration, such as the case of American chevron. Political positions, on the other hand, may have a significant role in the continuity of the firms or otherwise, halting their operations of oil production, such as the case of Chevron.

The researchers see as well, that the existence of a proved oil in a specific area, yet remainobstinate for the oil producing firm to deal with, since the exploration devices hit and miss, as to whether, the oil is existed, or not, or not existed in economic terms.

Unproved reserves
The first step in the field of oil production lies in the exploration for it in a wide area on land or inside the oceans. A step which requires expending much money, the yield of which, may or may not exceed the expenditure on oil exploration. In this respect, the accountant may be faced by the problem of how deal with such expenses. There are some significant questions that impose themselves in this regard, the most significant of which, are the following: are the expenses of oil extraction deemed as revenues expenses or capital expenses?And when they deemed to be capital expenses,would they be distributed only to the producing areas or even to non-producing areas? (Khalid, 2001:50).However, these expenses as we said previously would be treated as revenuesexpenses and must be stated at the end of the year in the loss and profit account.

The researchers maintained that the expenses of exploration must be treated in this way, since there is a difficulty in the determination of what can be capitalized from them. These expenses, however, cannot be exclusively attributed to a specific asset. As regards to thecost ofmachineries and equipment of explorationthey would be treated as a debit in the machineries and equipment of exploration account, and credit in the fund or bank account.

Drilling and development expenses

Drilling and development are the one of the most significant stages of oil industry, since the activities of drilling are those which determine exclusively, the existence or nonexistence of crude oil in a specific area, (Mukhtar, 1991: 113). The function of the operations ofgeological and geophysical exploration that preceded the stage of drilling,is exclusively limited to determine the most appropriate place of drilling or to specify rock composition (depth) which may have contained oil.After this stage, the well will be drilled and the drilling into the depth of the land will be increased until it reaches the layer and composition required. At this point, the existence or nonexistence of oil could be verified. The researchers hold that in terms of practice, the operations of oil drilling are technically accurate, that they need skills and expertise that which costs a lot of money. When the operations of oil drilling disclose the oil exploration in economic quantities, such exploration should be developed and the well should be prepared for production.

Classification of oil reserves

Oil reserve is defined as the quetenites of oil, which are existed in economic quantities in oil traps and wells. These reserves can be extracted, using the available technical potentials under the existing circumstance. Despite the fact that there is more than one definition for oil reserve, however, all of them are similar in meaning, where, the all require the following (Omar, 2012: 275):

1. Reserve exploration should be done by drilling one or more of exploration well.
2. It should be extracted by available means and technology.
3. It should be in economic quantities.
4. It should be existed in the subsoil.

Classification of oil reserves are as follows

1. **Proved reserves**: are confirmed oil reserves, that existed in the subsoil.
2. **Unproved reserves**: are non-existed oil reserves in the subsoil, which are the research in question.
3. **Strategic reserves**: are those types of reserves that may be placed in the form of stock, and are not calculated and not referred to upon the estimation of oil reserves.
4. **Possible reserves:** they are part of unproved reserves.

The researchers see that most of oil exploration firmscame up with unsatisfied results, but insisted on reexploring oil for the second time, in the hope that the firm will find sufficient oil reserve in economic quantitiesto gain the blessings of such project,if Allah is willing.

Prior literature

Study of: Samir Ereshani, 2002: this study aims to analyze the extent of agreement of accounting rules used in the oil and gas industry in Syria with the similar rules used by United States firms.This is by comparing the accounting rules used by the Syria firm (SPC) as a government firm, and the accounting rules and polices used by production-sharing firms in Syria, which represented by **ynapmoC liO setarhpuE**, with the generally accepted accounting principles, **aciremA fo setatS detinU eht fo ynapmoC noitcudorP saGdna liO eht yb deilppa**, which is represented in the successful efforts and full cost methods.

Based on the results of the pilot testing, it has been found that expenses based on the accounting rules of the Syrian **gnirahs-noitcudorp**firms **fo selur gnitnuocca eht no desab sesnepxe eht naht rehgih erew** the full cost **dohtem %63 tuoba yb** , and more than the expenses that based on the accounting rules in accordance with the successful effortsmethod by about 40%. When the existed differences in the measurement of expenses were analyzed, the fact was that they have been basically related to the following four categories of expenses: amortization, exploration, operation and management.

Based on the referred to above findings, the research recommended the adoption of the generally accepted accounting principles, in the oil and gas industry, or the international financial reporting standards, particularly, the (IFRS60),which relates to extractive industries, in the industry of oil and gas production in Syria.

1. **Study of Ernst& Young, 2009**: this research aimed to identify the similarities and differences between the American generally accepted accounting standards in the industry of oil and gas production, and the international financial reporting standards. The research, on the other hand, investigated the accounting rules and policies, applied in the production sharing contracts. The research findings have shown that accounting treatment, using the international financial reporting standards, or the generally accepted accounting principles, under the production sharing contracts, is the same. Paid costs, under the production sharing contracts must be treated either,by using the full cost method or successful efforts, and the cost recovery of oil revenues must be registered as revenues and not as a recovery of capitalized costs.
2. **Study of PWC, 2011:** this research aimed to investigate the effects of the prospected international accounting standards, with respect to which, the International Accounting Standards Board has issued a draft in June 2010, regarding the accounting treatments currently used in the oil and gas production firms.The research has dealt with the concept of client provided by the said international standard under the production sharing contracts, in which the relationship between the investing firm and the local government was determined as a correlation between the provider of the services or goods and the client who receives the services or goods.

This research findings have shown that the concept of client according to the Standard, is not clear enough, therefore, the research demanded the managements of the production of oil and gas firms to investigate the provisions of each production sharing contract, separately and with due care. This is because of the great differences in the provisions of production sharing contracts. Taking into account that, the selection of accounting treatment for the production sharing contracts depends largely on the nature of the relationship, imposed by the contract between the local government and the investing firm. Where, the relationship between the investing firm and the local government is likewise that which between the provider of the services and goods, and the client who receives the services and goods. In this respect, the investing firm must consider its all costs as receivablesin the financial liability of the client, who receives the production (local government).The investing firm, must as well, recognize the revenues when the agreed upon provisions in the contract have been met, such as the termination of the seismological study, or the approval of the exploratory work program, and the termination of the development program or the starting up of production.

Field study:

Research sample community:

The research sample community comprises all the employees of the Malaysian Petronas- Sudan. As to the research sample it has been randomly chosen from among the research community. To effect the field study, the researchers distributed (50) questionnaire forms to the research community respondents, where, (45) employees are responded to the required information, that is to say, 90% of the respondents, which is deemed appropriate.

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noitacifilauq cimedacA.	Frequency.	Percentage.
Bachelor.	13	39,9
Higher Diploma.	13	28,9
Master degree.	11	24,4
PhD degree.	3	6,7
Others.	5	11,1
Total.	45	100

It is clear that from table (1), that 28.9% of the research sample are bachelor holders, and 28.9% their academic qualification is a higher diploma, while those who obtained a master's degree are 24.4% and those who hold PhD are 6.7% and those hold other qualifications are 11.1%.

Table 2:-frequencies for research sample individuals according to years of experience.

Years of experience.	Frequency.	Percentage.
Five years or less.	12,2	2,2
From 6 to 10 years.	8	17,8
From 11 to 15 years.	27	60
More than 15 years.	9	20
Total.	45	100

Research instrument
The research depended on the questionnaire technique, which is the primary instrument in the data collection. Regard had paid upon its formation to its ability to diagnose and measure the research variables. In the determination of the questionnaire variables, the researchers relied upon numerous research and studies. This is besides, benefitting from the viewpoints of academic peers in the same scientific specialization, where, their substantive remarks have taken into consideration. According to which, indispensable amendments have been made.

Description of the questionnaire
In the preparation of the questionnaire, the researchers depended basically on the five-point Likert scale. The questionnaire comprised two axes, the first of which contained the data of the academic qualification and the years of experience. The second axis contained "30" statements represent the three research hypotheses. To ascertain the apparent reliabilityof the questionnaire and the validity of its statements, in terms of wording and clarity, the same was presented to a number of arbitrators and some necessary amendments were made.

Measurement of validity and reliability of questionnaire statements:
Apparent validity
the validity and reliability of the measurement tool have been tested following numerous stages and steps. Starting from the process of the verification of the validity of the instrument, meaning that, to ensure its validity for measurement. In this regard, the researchers depended on the face validity, where, they presented their views to arbitrators of the same experience and specialization, and provided them with the research objectives and hypotheses. The arbitrators then expressed their views and suggestions, on the basis of which, the questionnaire validity took its final from, which has been distributed to theresearched sample.

Measuring Inter-item reliability:
the intrinsic validity of the questionnaire has been statistically tested, using the intrinsic validity equation

That is to say, validity = reliability. The reliability coefficient of the scale used in the questionnaire was calculated based on the split have method, in accordance withthe Spearman Brown formula, and the results were as in the following table:

Table 3:- Statistical reliability and validity of the answers of the sample survey individualsto the questionnaire.

intrinsic validity coefficient.	Validity coefficient.	Hypothesis.
82%	68%	First
87%	76%	Second
79%	73%	Third
92%	89%	Complete questionnaire

It is evident from table (3) that all reliability and validity coefficients of the answers of the sample survey individuals to the statements of research hypotheses, and to the complete questionnaire, was greater than 65%, which indicates that the questionnaire is statistically accepted.

Statistical methods used:
The Statistical Package for the Social Sciences program SPSS was used in the data analysis. Other statistical methods were also used, the most significant of which, are graphs, frequency distribution of answers, percentages, Pearson correlation coefficient, Spearman formula to calculate the reliability coefficient, arithmetic mean and chi-square test for the significance of the differences between the answers.

Presentation of research findings and hypotheses testing
First hypothesis
high costs of the purchase of modern and advanced machinery and equipment affect the extraction of oilunder unproved reserves of Petronas- Sudan.

Table (4):-This table shows the frequency and percentage of the answers of the research sample individualsabout the statements of the hypotheses.

I strongly Disagree.	I disagree.	Neutral.	I agree.	I strongly agree.	Statement.	Number.
			5 11.2%	40 88,9%	Machineries and equipment are imported from outside the Sudan, whichincreasesthe operating costs	1
		1 2.2%	5 11.2%	39 86.7%	The value of machineries and equipment is very high, which increases the operating costs.	2
		3 6.7%	4 8.9%	38 84.4%	The more increase in the quality of the machineries and equipment, the more increase in their cost, which affects the operating costs.	3
		3 6.7%	5 11.1%	37 82.1%	Relocation of the machineries and equipment inside the Sudan to the exploration area, increases the operating costs.	4
		5 11.2%	4 8,8%	36 80%	Security guard of the machineries and equipment,since the areas are unsafe, increases the operating costs.	5
1 2.2%		2 4.4%	7 15,5%	35 7.9%	Heavy rainfall in the oil areas leads to halt the work of the machineries and equipment,which increases the operating costs.	6
3 6.7%		3 6.7%	9 20%	30 66.6%	Developing modern machineries and	7

					equipment affects, the rise of operating costs.	
	3 6.7%		10 22.2	32 71.1%	Maintenance of the machineries and equipment, which exposed to malfunctioning, increases the operating costs.	8
1 2.2%	3 6.7%		8 17,8%	33 73.3%	Heavy machineries and equipment need paved roads, which increases the operating costs.	9
2 4.4%	4 8.9%	2 4.4%	2 4.4%	35 77.9%	Machineries and equipment that work in the field of exploration, need constant electricity, which increases the operating costs.	10

Table(5):- Arithmetic mean and standard deviation, in addition to degrees of freedom and the probability value of the chi-square test for the answers of the research sample individuals about the first hypothesis.

probability value.	**degrees of freedom.**	**chi-square value.**	**Standard deviation.**	**Arithmetic mean.**	**Statement.**	**Number.**
0,01	**1**	**41**	**0,4**	**4**	Machineries and equipment are imported from outside the Sudan, which increasesthe operating costs.	**1**
0,01	**1**	**33,8**	**0,3**	**4,1**	The value of machineries and equipment is very high, which increases the operating costs.	**2**
0,02	**2**	**62,8**	**0,3**	**4,1**	The more increase in the quality of the machineries and equipment, the more increase in	**3**

					their cost, which affects the operating costs.	
0,01	**2**	**28**	**0,5**	**4,3**	Relocation of the machineries and equipment inside the Sudan to the exploration area, increases the operating costs.	**4**
0,03	**3**	**34**	**0,7**	**4,4**	Security guard of the machineries and equipment, since the areas are unsafe, increases the operating costs.	**5**
0,02	**1**	**33**	**0,03**	**4**	Heavy rainfall in the oil areas leads to halt the work of the machineries and equipment, which increases the operating costs.	**6**
0,01	**2**	**50**	**0,02**	**4,3**	Developing modern machineries and equipment affects, the rise of operating costs.	**7**
0,03	**2**	**44**	**0,01**	**4,1**	Maintenance of the machineries and equipment, which exposed to malfunctioning , increases the operating costs.	**8**
0,02	**3**	**50**	**0,03**	**4**	Heavy machineries and equipment need paved roads, which increases the operating costs.	**9**
0,01	**2**	**36**	**0,02**	**4,2**	Machineries and equipment that work in the field of exploration,	**10**

					need constant electricity, which increases the operating costs.	

It is obvious that the Arithmetic mean in table(5) forall statements is greater than the hypothetical Arithmetic mean.This, however, indicates that the answers of the respondents are heading towardsthe positive direction, meaning that, they agree to these statements. As to the standard deviation of these statements, it is ranging from 0.3 to 1, and this indicates the homogeneity of the answers of the respondents. In view of the probability value forall statements it is less than 0.05 level of significance. This, however, indicates the existence of differences of statistical significance, that is to say, the answers of the respondents are biased towards one answer and not the others.

Based on these facts, the validity of the hypothesis provides for: highpurchase costsof modern and advanced machineries and equipment, affect oil extraction under unproved reservesof the Malaysian Petronas-Sudan, has been proved.

Table (4) reflects the following facts

1. That 88.9% of the respondents strongly agree that importing machineries and equipment leads to increase thecosts, while 11.2%say they agree.
2. That 86.7% of the respondents strongly agree that the value of machineries and equipment is high, which in turn affects the operating costs, while **11**.**2**% say they agree and **6**.**7**% are neutral.
3. That 84.4% of the respondents strongly agree that the more increase of the quality of the machineries and equipment, the more increase of their costs, while 8.9% say they agree and **6**.**7**% are neutral.
4. That **82**.**1**% of the respondents strongly agree that the relocation of the machineries and equipment inside the Sudan to the exploration areas, increases the operating costs, while **11**.**2**%say they agree and **6**.**7**% are neutral.
5. That 80% of the respondents strongly agree that the guard of machineries and equipment by the security forces increases theoperating costs, while 8.8% say they agree and 11.2% are neutral.
6. That 77.9% strongly agree that the heavy rainfall leads to increase the production costs, while 15.5% say they agree and 4.4% are neutral, whereas 2.2% are strongly disagree.
7. That 66.6% of the respondents strongly agree that the development of modern machineries and equipment affects the increase of operating costs, while 20% say they agree and 6.7% are neutral, whereas 6.7% are strongly disagree.
8. That 71.1%of the respondents strongly agree that the maintenance of the machineries and equipment that exposed to malfunctioning,increases the operating costs, while 22.2% say they agree, whereas 6.7% disagree.
9. That 73.3% of the respondents strongly agree that heavy machineries and equipment need paved roads, which increases the operating costs, while 17.8% say they agree and 6.7% they disagree, whereas 2.2% strongly disagree.
10. That 79.9% of the respondents strongly agree thatthe machineries and equipment that work in the field of exploration need public electricity, while 4.4% say they agree and 4.4% are neutral, and 8.9% are disagree, whereas 4.4% are strongly disagree.

Second hypothesis: costs increase in the salaries and wages of the experts and employees affects the oil exploration under the unproved reserves.

Table (5):-This table shows the frequency and percentage of the answers of the research sample individualsabout the statements of the hypothesis.

I strongly disagree.	**I disagree.**	**Neutral.**	**I agree.**	**I Strongly agree.**	**Statement.**	**Number.**
		1 2.2%	3 6,76.%	41 91,1%	Payment of the salaries and wages of the experts and employees on a monthly basis, affects the increase	1

					of operating costs.	
			5 11.2%	40 88.8%	Paying attention to the health of employees affects the increase of operating costs.	2
	1 2.2%	1 2.2%	4 8.8%	39 86.6%	Construction of residential buildings for experts and employees in unpopulated areas, affects the increase of operating costs.	3
	2 4.4%	3 6.7%	7 15.5%	33 73.4%	Remoteness of the exploration areas from the cities, needs the existence of aviation, which affects the increase of operating costs.	4
1 2.2%		3 6.7%	11 24.5	30 66.6%	Existence of employment in remote areas requires security guard by the national army, which increases the operating costs.	5
			9 20%	36 80%	Due to the large number of employees, supervisors are appointed, which increases the operating costs.	6
	2 4,4%	3 6,7%	8 17,8%	32 71.1%	Due to the large number of employees and workers, there arises a need for four-wheel drive cars, which increases the operating costs.	7
	3 6,7%	4 8,9%	7 15,5%	31 68,9%	Due to the large number of employees, more fuel for vehicles is required, which increases the operating costs.	8

	3 6.7%	5 11.2%	7 15,5%	30 66,6%	Largeemployment requires water services and food, which increases the operating costs.	9
		1 %2,2		44 %97,8	Experts and employees end of service indemnity, costs the firm huge amounts of money, which increases the operating costs.	10

Table (5) reveals the following

1. That 91.1% of the respondents strongly agree that the monthly payment of the salaries and wages of experts and employees affects the increase of operating costs, while 6.7% say they agree and 2.2% are neutral.
2. That 88.8% of the respondents strongly agree that paying attention to the health of the employees affects the increase of costs of production, while 11.2% say they agree.
3. That 86.6% of the respondents strongly agree that the construction of residential building for the experts and employees, increases the operating costs, while 8.8% say they agree and 2.2% are neutral, whereas 2.2% disagree.
4. That 73.4% of the respondents strongly agree that the remoteness of the exploration areas from the cities needs the existence of aviation, which affects the increase of operating costs, while 15.5% say they agree and 6.7% are neutral, whereas 4.4% disagree.
5. That 66.5% of the respondents strongly agree thatthe existence of employment in remote areas requires security guard by the national army,while 24.5% say they agree and 6.7% are neutral, whereas 2.2% strongly disagree.
6. That 80% of the respondents strongly agree that due to the large number of the employees,supervisors are appointed, which increases the operating costs, while 20% say they agree.
7. That 71.1% of the respondents strongly agree that due to the large number of the employees and workers, there arises a need for four-wheel drive cars, which increases the operating costs, while 17.8%say they agree and 6.7% are neutrals, whereas 4.4% disagree.
8. That 68.9% of the respondents strongly agree that due to the large number of the employees, more fuel for vehicles is required, which increases the operating costs, while 15.5% say they agree and 8.9% are neutral, whereas 6.7% disagree.
9. That 66.6% of the respondents strongly agree that thelargeemployment requires water services and food, which increases the operating costs, while 15.5% say they agree and 11.2% are neutral, whereas 6.7% disagree.
10. That 97.8% of the respondents strongly agree that experts and employees end of service indemnity, costs the firm huge amounts of money, which increases the operating costs, while 2.2% are neutral.

Table (6), Arithmetic mean and standard deviation, in addition to degrees of freedom and the probability value of the chi-square test for the answers of the research sample individuals about the second hypothesis.

probability value.	**degrees of freedom.**	**chi-square value.**	**standard deviation.**	**Arithmetic mean.**	**Statement.**	**Number.**
0,02	2	62,8	0,5	4	Payment of the salaries and wages of the experts and employees on a monthly basis affects the increase of	1

					operating costs.	
0,02	2	62,8	0,4	4	Paying attention to the health of the employees affects the increase of operating costs.	2
0,02	2	48,9	0,4	4,1	Construction of residential buildings for experts and employees in unpopulated areas affects the increase of operating costs.	3
0,03	3	32,8	0,7	4,3	Remoteness of the exploration areas from the cities needs the existence of aviation, which affects the increase of operating costs.	4
0,01	4	37,6	0,8	4,2	Existenceof employment inremote areas requires security guard by the national army, which increases the operating costs.	5
0,03	3	33,5	0,4	4,1	Due to the large number of employees, supervisors are appointed, which increases the operating costs.	6
0,02	2	60,4	0,8	4	Due to the large number of employees and workers, there arises a need for four-wheel drive cars, which increases the operating costs.	7
0,01	1	55,4	0,7	4,2		8
0,02	2	40,3	0,5	4,1	Largeemployment requires water services and food, which	9

					increases the operating costs.	
0,03	3	35,4	0,4	4,3	Experts and employees end of service indemnity, costs the firm huge amounts of money, which increases the operating costs.	10

It is clear from table (6) that the Arithmetic mean forall statements is greater than the hypothetical Arithmetic mean.This, however, indicates that the answers of the respondents are heading towards the positive direction, meaning that, they agree to these statements. As to the standard deviation of these statements, it is ranging from 0.4 to 0.9, and this indicates the homogeneity of the answers of the respondents. In view of the probability value forall statements it is less than 0.05 level of significance. This, however, indicates the existence of differences of statistical significance, that is to say, the answers of the respondents are biased towards one answer and not the others.

Having regard to the said facts, the validity of the hypothesis, which provides for: higher salaries and wages of experts and employees affect the oil extraction under unproved reserves, has been proved.

The researchers agree with this finding because the wages of the experts are high, and paying attention to their health, and constructing residence for them greatly affect the increase of operating costs. This is in addition to the experts and employees end of service indemnity, which costs the firm more amount of money.

Third hypothesis: the increase of costs and expenses of search works and exploration affects oil extraction under unproved reserves.

Table (7):-This table shows the frequency and percentage of the answers of the research sample individuals about the statements of the hypothesis.

I strongly disagree.	I disagree.	Neutral.	I agree.	I strongly agree.	Statement.	Number.
		1 2,2%	3 6,7%	41 91,1%	Searchfor new areas needs strong machineries and vehicles, which increases the operatingcosts.	1
		1 2.2%	4 8.9%	40 88.9%	Search andexploration require the security guard, which increases the production costs.	2
				45 100%	Search and exploration requirethe preparation of maps and geological surveys, which increases the	3

					operating costs.	
		1 2.2%	3 6.7%	41 91.1%	Search andexploration require senior experts for whom large amounts of money must be paid, which increases theoperating costs.	4
		2 4.4%	4 8.9%	39 86.7%	The Survey and exploration process mayrequire the removal of some natural obstacles, which increasesthe operatingcosts.	5
		2 4.4%	3 6.7%	40 88.9%	Advanced survey devicesare of high price, which increasesthe operating costs.	6
	2 4.4%	8 17.7%	5 11.2	30 66.7%	The process of search and exploration may take a long time, which increases the operating costs.	7
		3 6.7%	75 11.2%	37 82.1%	Heavy rainfall in the oil areas leads to halt the process of exploration, which increases the period of time, which in turn increasesthe operating costs.	8
		2 4.4%	4 8.9%	39 86.7%	The remoteness of exploration areas from urban areas, requires the provision of food stuff and waters, which increases the operating costs.	9
4	2	6	5	27	The outbreak of	10

8.9%	4.4%	15.5%	11.2%	60%	wars between tribes is dangerous for the process of exploration, which increases the operating costs.	

Table (7) discloses the following:

1. That 91.1% of the respondents strongly agree that the searchfor new areas needs strong machineries and four-wheel drivevehicles, which increases the operatingcosts, while7.6% say they agree and 2.2% are neutral.
2. That 88.9% of the respondents strongly agree that search and exploration require the security guard, which increases the production costs, while 8.9% say they agree and 2.2% are neutral.
3. That 100% of the respondents strongly agree that search and exploration require the preparation of maps and geological surveys, which increases the operating costs.
4. That 91.1% of the respondents strongly agree that search and exploration require senior experts, which increases the operating costs, while 6.7% say they agree and 2.2% are neutral.
5. That 86.7% of the respondents strongly agree that the survey and exploration process may require the removal of some natural obstacles, which increases the operating costs, while 8.9% say they agree and 4.4% are neutral.
6. That 88.9% of the respondents strongly agree that advanced survey devices are of high price, which increases the operating costs, while 6.7% say they agree and 4.4% are neutral.
7. That 66.7% of the respondents strongly agree thatthe process of search and exploration may take a long time, which increases the operating costs, while 11.2% say they agree and 17.7% are neutral, whereas 4.4% disagree.
8. That 82.1% of the respondents strongly agree that heavy rainfall in the oil areas leads to halt the process of exploration, which increases the operating costs,while 11.2% say they agree and 6.7%are neutral.
9. That 86.7% of the respondents strongly agree that the remoteness of exploration areas from urban areas, increases the operating costs, while 8.9% say they agree and 4.4% are neutral.
10. That 60% of the respondents strongly agree that the outbreak of wars between tribes is dangerous for the process of exploration, which increases the operating costs, while 11.2% say they agree and 15.5% are neutral, whereas 4.4% disagree and 8.9% strongly disagree.

Table (8):-Arithmetic mean and standard deviation, in addition to degrees of freedom and the probability value of the chi-square test for the answers of the research sample individuals about the third hypothesis.

probability value.	**degrees of freedom.**	**chi-square.**	**standard deviation.**	**Arithmetic mean.**	**Statement.**	**Number.**
0,02	2	62,2	4	4	Searchfor new areas needs strong machineries and vehicles,whichincreases the operatingcosts.	1
0,02	2	59,4	0,4	4,1	Search andexploration require security guard, which increases the production costs.	2
0,02	2	35,2	0,4	4,1	Search and exploration requirethe preparation of maps and geological surveys, which increases the operating costs.	3

0,03	3	36,5	0,3	4,3	Search andexploration require senior experts for whom large amounts of money must be paid, which increases the operating costs.	4
0,01	1	37,6	0,8	4,2	The Survey and exploration process mayrequire the removal of some natural obstacles, which increases the operatingcosts.	5
0,02	2	40,3	0,4	4	Advanced survey devices are of high price, which increases the operating costs.	6
0,02	1	55,4	0,9	4,3	The process of search and exploration may take a long time, which increases the operating costs.	7
0,01	3	60,5	0,3	4	Heavy rainfall in the oil areas leads to halt the process of exploration, which increases the period of time, which in turn increases the operating costs.	8
0,02	2	63,4	0,4	4,2	The remoteness of exploration areas from urban areas, requires the provision of food stuff and waters, which increases the operating costs.	9
0,03	2	30,3	0,2	4,3	The outbreak of wars between tribes is dangerous for the process of exploration, which increasesthe operating costs.	10

It is clear from table (8) that the Arithmetic mean forall statements is greater than the hypothetical Arithmetic mean. This, however, indicates that the answers of the respondents are heading towards the positive direction, meaning that, they agree to these statements. As to the standard deviation of these statements, it is ranging from 0.9 to 0.2, and this indicates the homogeneity of the answers of the respondents. In view of the probability value forall

statements it is less than 0.05 level of significance. This, however, indicates the existence of differences of statistical significance, that is to say, the answers of the respondents are biased towards one answer and not the others.

Having regard to the said facts, the validity of the hypothesis, which provides for: the increase of the costs of search works and exploration affect oil extraction under unproved reserves of the Malaysian Petronas firm-Sudan, has been proved.

This is, however, due to the fact that the new search areas requirefour-wheel drives vehicles and preparation of maps as well as the removal of natural obstacles that hinder the process of search works. The purchase of modern and advanced devices would also lead to increase the costs of the search. The researchers have agreed that the provision of waters and food stuff and construction of residences are necessary.

Research findings

The research has reached the following findings:

1. Importation of the machineries and equipmentfrom outside the Sudan,causes the firm to incur a huge amount of money.
2. Machineries of high-qualitycause the firm to incur a huge amount of money.
3. Heavy machineries and equipment require asphalt roads (paved road).
4. High salaries and wages of the experts and employees cause the firm to incur a huge amount of money.
5. Experts and employees end of service indemnity, exhausts the firm's budget.
6. The process of search and exploration, requires the preparation of maps and geological survey, which causes the firm to incur a huge amount of money.

Research Recommendations And Suggestions:-

1. The research recommended purchasing of modern machineries and equipment to enhance the quality of work and reduce the time factor, in the process of search and exploration.
2. The research recommended paving the roads that lead to the wells sites to facilitate the flow of movement.
3. The research recommended the preparation of maps and geological survey in an excellent manner to help in the process of search and exploration.
4. Payment of the salaries and wages of the experts and employees as soon as possible in order to lift their morale.
5. The research recommended avoiding search and exploration during the fall in order to evade losses**.**
6. The research recommended tightening the security guard by the national army,fearing that armed groups may attack oil sites.

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