

Globalization and Technology Transfer in 3rd World Organization: A Case of the Oil and Gas Industry in South South Nigeria

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Abstract: *As the quest for knowledge and improved ways of doing things continually evolves among industries. The acquisition of modern technology becomes the drive of organization to meet with the demand of the competitive force on the global market. Therefore, this study examines globalization and technological transfer in 3rd World organization with emphasis on Nigeria. The work considered selected multinational cooperation operating in the South-South region of Nigeria. Three multinational organization that was considered for the study are NLNG, NNPC, SPDC and Agip. A sample size of 150 person(s) gotten through cluster sampling method was used. Questionnaire was employ as the instrument for the study. The four (4) likert scale of very high extent (VHE) 4, high extent (HE) 3, low extent (LE) 2, and very low extent (VLE) 1, was adopted and mean, standard deviation and chi-square were the statistical tool used for the data analysis. The result and findings of the study showed there is technical training and workshop given to staff and vendors on specific project. The recommendation was that Government should employ stringent measures to ensured registered or Licensed operators are willing to meet up with the standard of the agreement or else loss their license and too monitor her personnel that they do not compromise and thwart the effort so far made.*

Keywords: *Globalization, Multinational Cooperation Technology transfer, Third World Organization.*

INTRODUCTION

Throughout the ages, knowledge sharing have played significant role in achieving a sustainable socio-economic development. The increasing pace of globalization in all sphere of life and the advancement in technology have push the Third World country which Nigeria is one into hennaing the benefit from the abundance innovations and technological resources globally. The world being truly a global village, hence it encourages and enhance trade of goods and man power as well as technology transfer. Globalization in the words of Anuowom (2007) "is the right connection between national economics through commerce, investment and capital flows made possible by technical improvement and the transformation of the world of telecommunication into a global village. Globalization becomes the means of human resource capital brought through technological transfer which endanger economics development and growth. In its definition, it is "the intensification of Worldwide social relations that link distance localities in such a way that local happenings are shaped by events occurring many miles away

and vice versa". As in (Oyegun & Okoro, 2023). Simply put, it encompasses the domestic, regional and international centre state of affairs be it economic, political, environmental, technological, cultural and social life. The point is that globalization is an article of change that have impress on every sphere of life. Browom with it reformative transformation that advances the global ways of doing things. To this end, the Wide world become technological evolving and knowledge acquisition becomes inevitable by nation especially developing countries to meet with current trends. This is because, in modern times, global technologies, have turn out to be a substantial implement for businesses to weather workable conglomerates and put together a massive value connection with other businesses (Ikegwuru, 2022).

Technology according to the United Nation Draft International code of conduct on the transfer of technology (TOT) as in Ajibo et al (2019) is "systematic knowledge for the manufacture of a product, for the application of a process or for the rendering of a service exclusive of transactions involving the mere sales or mere lease of goods". Again OECD manual defines technology to be "the state of knowledge concerning ways of converting resources into outputs". The implication of technology is that it brings about advancement in know-how and the appropriation of resources for effective output.

Technology transfer can be referred to contract or agreement including renewals, trade involving the transfer of systematic knowledge for the manufacturing of product, the application of the process or rendering of service including management contracts as well as transfer assignment or licensing of all forms. It is otherwise called (TOT) meaning transfer of technology. It is also defined as the flow of know-how, technology and technical knowledge among institutional or organizational environment (Bozeman, 2000). Again it can be viewed as the import of know-how, technology and skill set between organizations from one sitting to another. It can best be described as the embryo to third world industrialization. Oyedoyin et al (2013) remarked that technology transfer simply is a process of communication that evolves out of research findings or new information being put into practice. This paper takes a view at globalization and how transfer of technology have fairs in Nigeria with particular emphasis on the oil and gas industry in the country, which have contributed greatly to the main stay of the nation economy. Given the impact that oil and gas industry have had on nation through their international oil companies (IOCs) where their operations are carried out globally on transfer of technology.

Oyedoyin, Ilori, Oyebisi, Oluwale and Jegede (2013) in their study technology transfer process in Nigeria from R & D output entrepreneurship covered all the industrial research institutions with headquarters in South-Western Nigeria and again agricultural research institutes with crop utilization departments in the region. These institutes were Nigeria institute for oceanograph and marine Research (NIOMR), ladies, Nigerian Building and Road Research Institute (NBRRRI), Ota, Federal Institute for Industrial Research Oshodi (FIIRO), Lagos, Cocoa Research Institute of Nigeria (CRIN), Ibadan Engineering and Material Development Institute (EMDI), Akure National Institute for Horticultural Research (NIHORT), Ibadan, Forestry Research Institute of Nigeria (FRIN), Jericho, Ibadan Institute of Agricultural Research and Training (IAR&T), Ibadan and Nigerian Madural Medicine Development Agency (NNMDA), Lagos. Structured questionnaire technique, interview and secondary data were all instrument for the study. Analysis from properly filled questionnaire was done using descriptive and inferential statistics which were frequency counts, percentages, cross tabulations, correlation, regression analysis and analysis of

variance (ANOVA). The results showed that R & D transfer from the research institute (RI) to entrepreneur at NHORT was rated high (3.0) in the involvement of scientist in all process except in investment analysis which was low and rated at (2.0). at IAR & T, CRIN, FIRO, NIOMB, very high involvement of scientist in transfer of technology was rate at (3.0 – 5.0). While at FRIN and NNMDA, their involvement in identification of process equipment and raw material studies were rated very high at (4.0 -5.0) and (4.0-5.0) respectively. Notion that they were not involved in investment analysis whereas process engineers were never involved in transfer of technology at NNMDA to entrepreneurs. Engineers were highly involved (3.0-STO) in R & D transfer activities except in investment analysis where they score low in involvement at IAR. However, technology marketers were completely engaged in all the technology transfer at NHORT, FIRO, NIOMR and IAR & T whereas they were low at CRIN and totally not involved at FRIN and NNMDA respectively. The most frequently used technology transfer strategy was training workshops. It was notice finally that not every stakeholder were part and parcel in the innovation process and the R&D transfer.

Owolus, O.D (2012) carried out study on forecasting international technology transfer and international trade in Nigeria a time series analysis. The aim of the study was to examine the long-run equilibrium as well as to investigate the short-term impact of inward foreign direct investment (FDI) trade, domestic investment (DI) and economic growth on international technology transfer in Nigeria from 1970 to 2010, adopted to investigate the long-run equilibrium relationship was a multivariate cointegration technique as developed by Johnson and Juslius (1990). Again from the result analysis it affirmed the existence of cointegrating vectors in the systems of this nation at the period of the study. Also, short-term inward impact, trade and domestic investment on international technology transfer to Nigeria was ascertained via Granger causality test, based on vector error-correction model. The outcome of the test showed that a short-run causal effect either running unidirectionally or bidirectionally between the variables for the nation. Finally, all the variable in the Nigerian system were adjusting to equilibrium in the long-run, however, with the exception of domestic investment (DR), which failed to do the adjustment in the long-run. The findings indicate the need for Nigeria (and all developing countries) to provide policies that will attract FDI in the service sector, in bid to improve the infrastructural facilities, as well compliment the resource and market seeking FDI from developed economics, providing labour force expansion and adequate educational policy to elevate the stock of human capital in the nation was recommended.

Join Venture Agreement and Transfer of Technology in Nigeria

A joint venture is a business entity/agreement entered into or formulated by two or more parties to achieve a particular task or business goal while keeping their individual or separate identities. In bid, it is an agreement of shared purpose, goal while at same time maintaining individual business self identity. It could be informed by emerging market to gain profit, margin through their combining assets and operations, or to share the risk for major investment or project, or accessing skill and capabilities.

However, it could be said “it involves the join pooling of assets, production, finance, profit, risk, marketing, management, and servicing together to achieve a common purpose or objective” as in (Ajibo, et al., 2019). Simply put as a shared acquisition of process engender in achievement of set goals as well as associated risk. This implies that technology can be transferred in a Join venture agreement or arrangement by ways of

Liaisons, operational support and technical training (Ajibo, et al., 2019). (Oyedoyin, et al., 2013), remarked Joint venture as strategy for technology transfer, stressing further Ajibo enlightened that recipient country gets technical know-how in the area of marketing processes, maintenance processes, plant design and installation, spare parts acquisition, raw materials and production processes as in (UNCTAD, 2012).

In the Nigeria concept Joint venture agreement have forms a huge aspect and prominent part of the oil and gas business operation in the country. The Nigeria government have ceased this avenue in creating a transfer spillover of technology to indigenous firm in other that they might gradually acquire the know-how to manage a home-made or indigenous company that can compete in mixing oil and gas nationally and internationally through the acquisition of technology transfer by means of Joint venture operations.

In the words of Wabole (2019) “95 percent of the oil and gas service comprised be it onshore or swamp drilling well intervention and simulation activities are by Nigerians”. This is yielding positive return on the industry as could be seen by the entrance of such fair competitive indigenous oil companies as Seplat Eagery, Oando and consolidated oils among others. “Also, the subsidiary oil field are operated by Nigerias, adding up molecules of the unfinished oil barrels in the petroleum subdivision” according to Okoro and Ndukwe (2022). Conversely, Tesfayohannes and Termtime (2002) noted that the associated risk with the Joint venture kind of transfer of technology is not far from fear stems associated with the fragile socio-economic structure and stagnant government regulations. Succulently, the indigenous companies with few exceptions have engaged an established international oil firm as technical partners in their operations for which the government has been supportive of this (Nwachukwu, 2013). Nordas et al (2003) opined “16 indigenous Nigerian companies that have made commercial discoveries and 7 of them at the period in 2003 produce oil ranging from 800-35,000 barrels a day.

Licensing and Transfer of Technology in Nigeria

In business operations technology can always be licensed to interest parties seeking the technology. Beside licensing covers, a large spectrum of permissions granted for use of patents, technology and trademarks. For a license on technical know-how, information on manufacturing processes, drawings, diagrams, operating manuals, expertise, design, manufacturing capability, advise on necessary equipment, standard and quality control of product and engineering assistance, etc. are made accessible and transferred. Again, most organization grant exclusive or non-exclusive right as trademark owners or licensor to a Nigerian company to deploy the mark to manufacture and sell its goods and services. The trademark license agreement must be accompanied or followed by technical know-how by the licensor in bid to ensure that the produce goods and services for which the trademark is for use meet the specified standard. Ajibo et al further added that:

1. Patent license is for use for a specific purpose such as the health-related initiatives.
2. The know-how license, is a classified information and therefore not accessible to a non-party to the licensing agreement and
3. The technical assistance agreement, is usually tailored for the provision and supply of scientific and technological assistance and training.

To this end, it means a licensing agreement by a country or between companies enriches transfer to technology as well as remunerative value for transfer. According to Ajibo et al

in (Hockman, 2005) on the transfer of technology to Nigeria are registrable by NOTAP if wholly or partially related to the listed below:

1. The right to use potential inventions
2. The supply of basic or detailed engineering
3. The use of trademarks
4. The provision of operating staff or managerial assistance and training of personal
5. The supply of machinery and plant and
6. The supply of technical expertise in the form of the preparation of plans, diagrams, operating manual or other form of technical assistance of any decriptional whatsoever.

Finally, Okoro and Ndukwu (2022) added “implementation of the Nigeria local content act has ensured that substantial proportion of materials, engineering parts and human capital utilized in Nigeria oil and gas are domiciled in Nigeria. Supporting this view Oyedoyin et al (2019) stated “licensing of the R & D output is usually to one or more existing companies for the purpose of commercialization”.

Technology Transfer

Adequate technology transfer is one of the spin contributors of enhance economic development. UNCTAD (2012) described it to mean “all forms of technological exchange that lead to building the technological capacities of the user/recipient”. Oyedoyin et al added that it is a form of advocacy for change through adoption of technology. Ajibo et al in their view sees technology transfer “as a series of processes for exchanging or sharing knowledge, ideas, skills and technology with another entity, individual, or institution (such as university, a company, or a government entity) and acquisition by the other of such knowledge, ideas, skills, and technology.

The point here remains that there is no single port throw, which transfer can be achieved. The crux is that it aims to achieve certain objectives despite it channels (commercial or non-commercial, contractual or non-contractual). In bid, each nation manages the means of technology transfer via registration. In Nigeria, the national office for technology acquisition and promotion (NOTAP) is saddled with the registration of technology transfer agreement except other specification outside the schedule of registration (NOTAP). Therefore, technology transfer is a reflection of the country where the position of most domicile technology is form. The case of Nigeria is a dominant Western countries technology which is not far from our former colony. However, Asian nation have also been involved in technology transfer to Nigeria particular China and India. For the purpose of this paper the under listed transfer type are mentioned.

Methodology

The study covers major Join venture companies with headquarter in the South-South Nigeria in the oil and gas operation and the license operators in the region. The major Join venture were shell petroleum development company (SPDC) self-petroleum Nigeria limited, Nigeria Agip oil company limited, mobil producing Nigeria unlimited and Chevron Nigeria limited and 10 indigenou license holder were also considered to include Emerald petroleum, continental oil and gas, Cavendish petroleum, conoil producing limited, Nestoil, Seplat energy, Obekpa petroleum limited South Atlantic petroleum, moni Pulo limited and express petroleum gas co. the research instrument for the study were structured questionnaire technique, interview schedule as well as secondary information collected. A descriptive research survey design was used. The sample size of one

hundred and fifty person(s) was selected through a clustered sampling technique. The descriptive statistical tool was employed for data analysis of result from well structured questionnaire using inferential tool of frequency mean and standard deviation as well as chi-square at 0.05 significance level and 15 degree of freedom for testing the hypothesis.

DATA PRESENTATION, ANALYSIS AND DISCUSSION

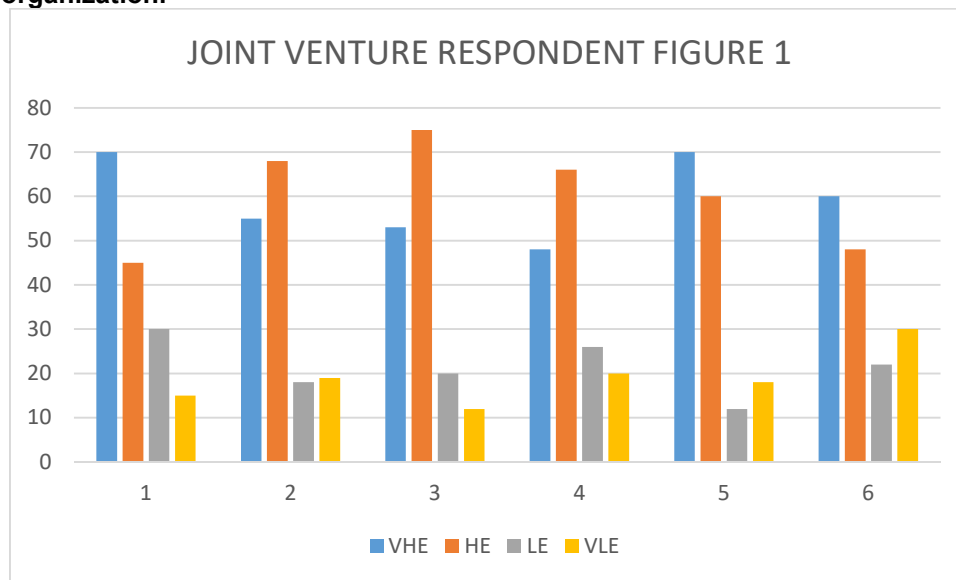
Table 1: Company Respondent

RESPONDENT	QUESTIONNAIRE	RETURN	NON RETURN	PERCENTAGE (%)
JOIN VENTURE	200	160	40	80
INDIGENOUS LICENSED HOLDER	200	160	40	80
TOTAL	400	320	80	80

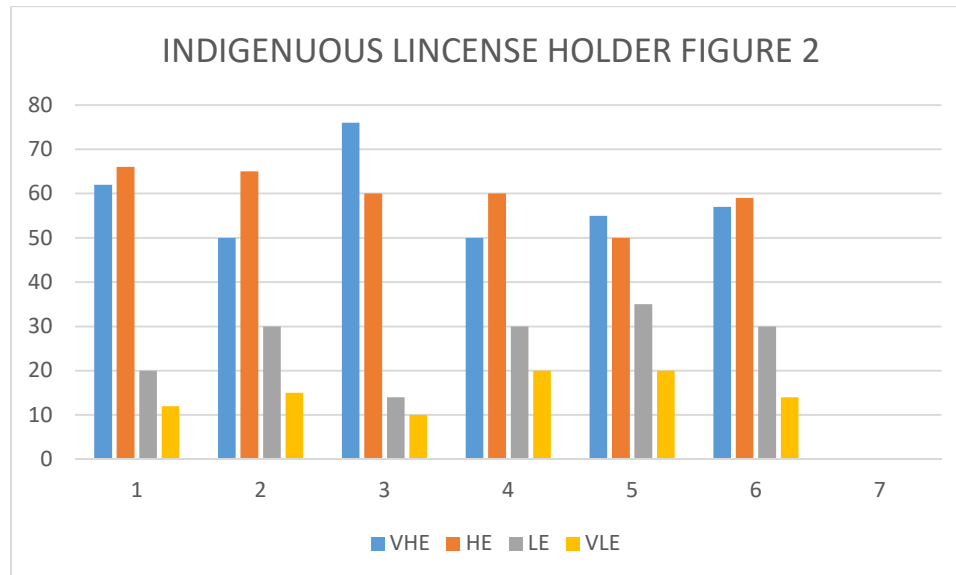
Researcher Field Source (2023)

Table 1 shows and even distribution of questionnaire of 200 each to the different category of respondent and both respondent have 160 returned questionnaire which represent 80 percent of the total of 200.

Research Q1: Hypothesis 1: The more the Joint Venture the more the transfer of technology in the organization.



Research Q2: The more the Licensed Indigenous Holders the more the transfer of technology in the Organisation



Discussion

In Table 2, 70 and 45 respondents agree to a very high extent and high extent that the company offers operational support to vendors while 30 and 15 respondent disagree to that to a low and very low extent respectively. Again, 55 and 68 respondent accepts that technical training and workshops are given to indigenous staff and vendor on specific projects while 18 and 19 respondents do not accept it is so. Which is low and very low extent respectively as to the former (55 and 68 very high extent and high extent). However, 53 and 75 respondent agreed to a very high extent and high extent that indigenous staff participate in place design and installation whereas 20 and 12 of the respondent object to the opinion which indicate low and very low extent. Furthermore, to very high extent and high extent, 48 and 66 respondent accepted that indigenous vendors provide equipment and spare parts from recommended OEM and manufacturer while to a low and very low extent 26 and 20 of the respondent do not accept. Also, 70 and 60 of the respondent to a very high extent and high extent agree that indigenous vendors participate in production process while 12 and 18 respondent disagree to a low and very low extent. In bid, 60 and 48 of the respondent indicates to very high extent and high extent that issues can be responded to on absent of expatriate worker and 22 and 30 of the respondent were not in agreement to that.

Finally, $X^2_{cal} < X^2_{tab}$ ($X^2_{cal} 37.640 > X^2_{tab} 25.000$) at 0.05 level of significance, 15 degree of freedom, the hypothesis is rejected by its setting, hence the new hypothesis should be the more the Joint Venture the less the transfer of technology.

Research question 2 table 3 shows that 62 and 66 respondents to a very high extent and high extent agree that the company have up to 85 percent indigenous staff at managerial level while 20 and 12 respondents to a low and very low extent disagree. Also, 50 and 65 respondents to a very high extent and high extent agree to the view that the company have the know-how regarding the operation while the other 30 and 15 respondents to a low and very low extent disagree. However, 136 respondents to a very high extent and

high extent noted that the company have trademark while 24 respondents of a low extent and very low extent had a contrary view. Again, 110 respondents agree to a very high extent and high extent that the company receives technical assistance and support but 50 differ on the option at low extent and very low extent. Furthermore, 110 respondents accepted to a very high extent and high extent that company have access to information on manufacturing process and on the contrary 55 respondents do not accept the option. Moreso, 116 respondents to a very high extent and high extent remarked that the company can do maintenance and installation whereas, 44 respondents said the different option which were of a low extent and very low extent respectively. The $X^2_{ca} > X^2_{tab}$ ($X^2_{cal}27.236 > X^2_{tab}25.000$) at 0.05 level of significance, 15 degree of freedom, the hypothesis is rejected in its settings, hence the new hypothesis should be the more the licensing agreement, the less the transfer of technology.

Findings:

1. There was technical training and workshop given to staff and vendors on specific project.
2. Indigenous staff participate in plant designs and installation
3. Issues can be responded to on absent of expatriate worker.
4. The company have know-how regarding the licensed operation.
5. The company have up to 85 percent ingenious staff quota at the managerial level.
6. Also, the company is given the access to information on manufacturing process.

Conclusion

The contribution of the Joint Venture (JV's) agreement and Licensing agreement to the economic growth of any nation as in the South South Nigeria cannot be undermined despite that when it comes to related Transfer of Technology (TOT) it is in a slow pace or simply put 'piece meal' as such impact is not felt when compared to the expectation from the organisation.

Succinctly, the Nigeria Content Development and Monitoring Board (NCDMB) should intensify effort in ensuring operatives in the Oil and Gas business leaves up to their expectations.

Recommendations

1. The Nigeria Local Content board should increase monitoring to ascertain whether the JV's and Licensed companies are truly implementing the local content aspect of their agreement.
2. Companies should not be discouraged by staff who have acquired technical know-how leaving the company abroad or to other organisation.
3. NOTAP should monitor organisation carrying out operation whether they are still meeting the necessary requirement in line with current and best standard as to their operation and that the transfer technology are not obsolete.
4. Government should employ stringent measures to ensured registered or Licensed operators are willing to meet up with the standard of the agreement or else loss their license and too monitor her personnel that they do not compromise and thwart the effort so far made.

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Appendix

Table 2: Research Q 1: To what extent does Join Venture impacts technology transfer on the organization?

S/N	VHE	HE	LE	VLE	TOTAL	MEAN	SD	χ^2_{cal}	REMARK
1	70(45)	45(70)	30(25)	15(30)	160	3.06	0.20	10.180	Accepted
2	55(68)	68(55)	18(19)	19(18)	160	2.99	0.19	1.811	Accepted
3	53(75)	75(53)	20(12)	12(20)	160	3.06	0.20	6.904	Accepted
4	48(66)	66(48)	26(20)	20(26)	160	2.89	0.18	3.773	Accepted
5	70(60)	60(70)	12(18)	18(12)	160	3.14	0.20	6.055	Accepted
6	60(48)	48(60)	22(30)	30(22)	160	3.00	0.25	8.917	Accepted
TOTAL	356(362)	362(556)	128(114)	114(128)	960	3.03	0.19	37.640	

Researcher Field Source (2023)

Table 3: Research Q2: To what extent does Licensing impacts technology transfer on the organization?

S/N	VHE	HE	LE	VLE	TOTAL	MEAN	SD	χ^2_{cal}	REMARK
7	62(66)	66(62)	20(12)	12(20)	160	3.11	0.20	3.087	Accepted
8	50(65)	65(50)	30(15)	15(30)	160	2.94	0.19	2.071	Accepted
9	76(60)	60(76)	14(10)	10(14)	160	3.26	0.21	12.258	Accepted
10	50(60)	60(50)	30(20)	20(30)	160	2.89	0.19	3.190	Accepted
11	55(50)	50(55)	35(20)	20(35)	160	2.88	0.19	6.121	Accepted
12	57(59)	59(57)	30(14)	14(30)	160	2.93	0.52	0.599	Accepted
TOTAL	350(360)	360(350)	159(91)	91(159)	960	3.02	0.20	27.326	

Researcher Field Source (2023)

Questionnaire

S/N	Research Question One: To what extent does Join Venture impact technology transfer in the organization?	VHE	HE	LE	VLE
1.	Does the company offer operational support to vendors?				
2.	Technical training and workshop are given to indigenous staff and vendors on specifics project?				
3.	Does indigenous staff participate in plant design and installation?				
4.	Indigenous vendor procure equipment and spare parts from recommended OEM and Manufacturer?				
5.	Indigenous vendors participate in production process?				
6.	Issues can be responded to on absent of expatriate worker?				
	Research Question Two: To what extent does Licensing impact technology transfer in the organization?				
7.	Does the company have up to 85% quota indigenous staff at managerial level?				
8.	The company have the know-how regarding the licensed operation?				
9.	Does the company have a trademark?				
10.	The company receives technical assistance and support?				
11.	The company have access on information on manufacturing process?				
12.	The company can do maintenance an installation?				