# Evaluation of Formation Damage Models on Effective Wellbore Radius, Economics and Flow Productivity of Niger Delta Oil Reservoirs

**Nmegbu Chukwuma Godwin Jacob & Orisa Ebube Favour**
Department of Petroleum Engineering,
Rivers State University of Science and Technology,
Port Harcourt, Nigeria.
gnmegbu@gmail.com, ebubeorisa@yahoo.com

***Abstract***
*Formation damage can* ***incur c****onsiderable cost for remediation and deferred production. Thorough understanding of the formation damage mechanisms, stringent measures for its control and prevention, and effective and efficient treatments are the keys for optimum production strategies for oil and gas fields. Four formation damage models were numerically evaluated and matched to the conventional pressure buildup skin model using reservoir and well production data from five (5) different Niger Delta locations assigned ND-1, ND-2, ND-3, ND4 and ND-5. Sensitivity analysis conducted in ND-5 using Matlab R2007a revealed that skin magnitude predictions with the B-R model can be unstable for wellbore radiuses below 0.50 ft, while that for the Ozkan model revealed that there will no significant change in skin magnitude estimation regardless of the producing wellbore radius. Economic evaluation of these models showed that an average annual revenue loss of 29.24 million USD from the Furui et al model would be preferred over a 31.46 million USD and 32.44 million USD average annual revenue loss incurred from the Behr & Raflee and Ozkan models respectively.*

## 1. Introduction

The Niger Delta is a large acreage delta of hydrocarbon provinces sited on the Gulf of Guinea on the west coast of central Africa (Southern Nigeria). Its range lies within longitudes 4ºE – 9ºE and latitudes 4ºN - 9ºN, comprising an overall regressive clastic sequence that reaches a maximum thickness of about 12 km (Evamy *et al*., 1978). The sedimentary basin occupies a total area of about 75,000km$^2$, extending more than 300km from apex to mouth, and is at least 11km deep in its deepest parts. The province consists of known resources (cumulative production plus proved reserves) of 34.5BBO and 93.8TCFG (Ogedengbe *et al*., 2004). Agbada Formation is considered where petroleum in the Niger Delta is gotten from out of the sandstone and unconsolidated sands (Ogbedengbe *et al*., 2004). The reservoir quality of the sands is strongly dependent on the environment of deposition and the depth. (Daukaru 1975). Eocene and paliocene are the known reservoir rocks are often stacked, with thickness ranging from less than 15meters 50-10% having greater than 45meters thickness. (Evamy *et al*., 1978).
Although almost all of the more than 150 oil fields are essentially anticlinal structures, only about one fifth are unfaulted; gently dipping oval anticlines bordered on one side by a growth fault. The great majority of Nigerian fields however have at least one fault besides the major growth fault which influences accumulation (Daukoru, 1975).

On the delta flanks, statigraphic traps are likely as unoirtabt as stryctyrak traos (Beka and Oti, 1995). Sandstone pockets exist between diapriric structures in this region. The interbedded shale found in the agbada formation is the primary source rock in the Niger Delta. The shale gives three categories of seals along faults, interbedded sealing units against which reservoir sands are juxtaposed as a result of faulting, and vertical reals (Tuttle *et al.*, 1999).

The Niger Delta oil bearing rocks have been thought and proven to suffer some reservoir rock-related productivity problems. These problems span from sand production as a result of the unconsolidated nature of the reservoir rocks to formation damage or permeability impairment, possibly as a result of fines migration and other sources (Nmegbu and Meshack, 2018). In formation damage scenarios, well do not respond as expected in terms of productivity after work over operations and in cases of injection wells, excessive pressure build-up may be recorded. In such cases, a well previously producing at an excellent flow efficiency coefficient may record retardation in productivity with time. Surveys and analysis of flow in damaged systems show that a higher percentage of the zone open to flow into the wellbore does not contribute to the total flow and as such, a substantial volume of the reserve may be left unrecovered and trapped in potentially productive reservoirs. In most cases, complete restoration of the well productivity is usually not guaranteed but sound engineering techniques and recovery methods may prove fruitful. Formation damage intensity is usually measured during well tests. Analysis of pressure build-up or fall-off tests may provide a relative magnitude of the effect of skin or "damage". The accurate diagnostics of skin effect is usually hampered by the lack of sufficiently detailed information on the characteristics of the reference reservoir rock and fluid system. It is hence imperative that careful review well completion or work over operation report is performed to as to retrieve comprehensively reliable information on damage intensity so as to plan for potential mitigation techniques.

Formation damage is very expensive to mitigate, especially in regions where it is inevitable (such as the Niger delta). Usually responsible for early abandonment of potentially productive pay zones, it stimulates delayed or reduced investment turnovers were incurred. Before the occurrence of this phenomenon, the reservoir rock and fluid system is essentially in a state of physio-chemical and thermodynamic equilibrium. This equilibrium is distorted during depletion, injection and mostly during the drilling operation. During drilling, to attain over balance, mud pressure usually exceeds the pore pressure to prevent formation fluid influx. The resultant differential pressure then promotes invasion of fine colloidal materials into the vicinity of the wellbore where permeability is altered and fluid flow channels are reduced. This implies that this phenomenon is inevitable, and as such, an economic analysis for this phenomenon is important for optimum well planning and development

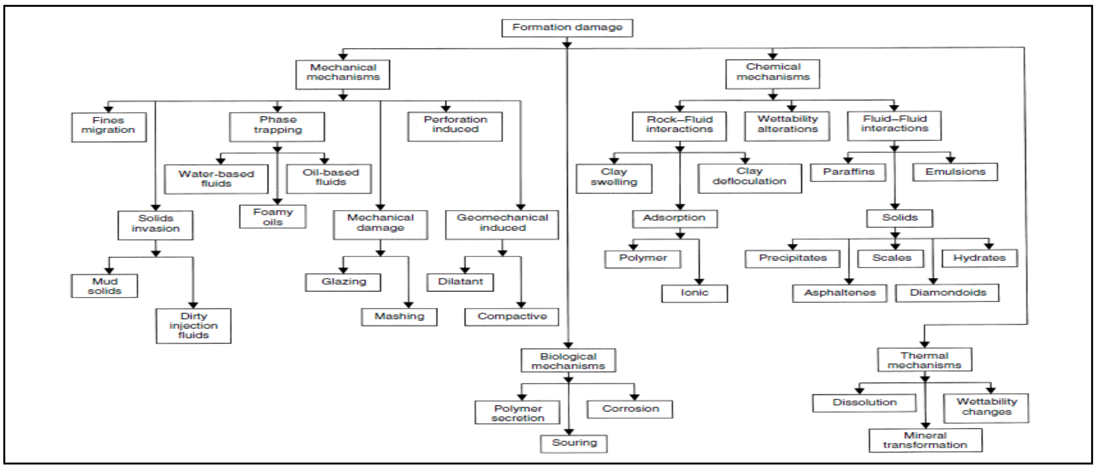


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**Figure 2.2 Classification and order of the Common Formation Damage Mechanisms**
Source: (Bennion, 1999)

Particle retention and accumulation in porous media can be caused a wide range of mechanisms that may include; (London-Van der Waals, double electrical layer, etc.), electrical forces multi particle bridging, size exclusion (large particles captured in small pore throats) and gravity segregation. (Seljakov and Kadet, 1996).
Fallah *et al.*, (2013) when deriving a mathematical model for particle suspension flow through porous medium outlined that transport of suspensions and emulsions in porous media occurs in numerous processes of in the disciplines of environmental, petroleum and chemical engineering. In their analysis, a mass balance particle transport equation that included filtration was expressed. Their steady-state transport equation was presented using an advective-dispersion model for particulate suspension. The model included transport parameters such as particle advective velocity, particle longitudinal dispersion coefficient and filter coefficient. However, the study recommended that investigated through particle longitudinal dispersion calculation from experimental data, directly. Besides, the numerical model has to be developed for general case of a transition filter coefficient.

Formation damage both undesirable economically and operationally, hence, it is considered as a difficult problem to the oil and gas industry (Leontaritis et al., 1994). As expressed by Amaefule et al., 1988, "formation damage is an expensive headache to the oil and gas industry." Formation damage assessment, control, and remediation are among the most important issues to be resolved for efficient exploitation of hydrocarbon reservoirs (Civan, 2005).formation damage does not occur naturally. Quite a number of operation failures and frequent overhauling of several production equipment attributed to sanding and other sand related problems have been a reason for concern in recent times within the Niger Delta. The unconsolidated nature of the reservoir sometimes proves adequate and efficient sand control measures incompetent. It is almost an impossible task controlling the rate of sand or fine migration from reservoir to the producing well, but several sand control measures such as sand screens and gravel packers have been able to reduce the detrimental effects of this phenomenon. The use of these restrictions impedes flow and as such, reduces expected projected turnovers. Hence, an adequate scrutiny of damage models will prompt the evaluation of sound engineering methods to mitigate sanding problems. This scrutiny will also to a large extent, inform good investment decisions in areas where formation damage is inevitable (area such as the Niger Delta).

## 2. Materials and Methods

Field parameters were collected form five (5) reservoirs at different locations within the Niger Delta as recorded in (Nmegbu and Meshack, 2018). Reservoir rock and fluid parameters were obtained from the five (5) different reservoirs within the region of interest. The parameters so obtained from each oil reservoir include; initial and present fluid saturation data for oil water and gas for each reservoir, oil FVF, gas oil ratios, initial reservoir pressure, bubble point pressure, average formation porosity, fluid compressibility, rock compressibility, oil gravities, fluid densities, fluid contact information well parameters (size, orientation, depth Etc.), fluid viscosities, dip angle, contact angle. Others include reservoir sandstone properties, production rates, pressure buildup and drawdown information, fluid transmissibility data, formation conductivity and resistivity parameters via formation evaluation. The nomenclature assigned to each location is ND-1, ND-2, NG-3, ND-4 and ND-5, with ND-5 being the only offshore field amongst all five operators.

### 2.1. Damage (Skin) Models to be Evaluated (Nmegbu and Meshack, 2018)

### 2.1.1 Frick and Economides Model

In the estimation of equivalent skin factor, assuming both conically and cylindrically shaped damaged zone and putting into consideration the net pay thickness of the reservoir pay interval, the magnitude of formation damage will be estimated using that presented by Yildiz, (2008);

$$S_{FE} = \left(\frac{k}{k_d} - 1\right) \ln\left(\frac{1}{3}\sqrt{\frac{r_{dh}^2}{r_w^2} + \frac{r_{dh}}{r_w} + 1}\right) \qquad (3.01)$$

Where

$S_{FE}$ Dimensionless Frick and Economides skin factor.

k is the average undamaged reservoir permeability, mD

$k_d$ is the damaged reservoir permeability, mD

$r_{dh}$ is the damaged radius for the payzone, (ft)

$r_w$ is the wellbore radius, (ft)

### 2.1.2 Furui *et al.*, Model

$$S_{(x)} = \left[\frac{k}{k_{d(x)}} - 1\right] \ln\left[\frac{1}{I_{ani}+1}\left(\frac{r_{d(x)}}{r_w} + \sqrt{\left(\frac{r_{d(x)}}{r_w}\right)^2 + I_{ani}^2 - 1}\right)\right] \qquad (3.02)$$

$$I_{ani} = \sqrt{\frac{k_H}{k_V}}$$

Where;

$S_{(x)}$ Dimensionless skin factor at damaged radius x

k is the average undamaged reservoir permeability, mD

$k_d$ is the damaged reservoir permeability, mD

$I_{ani}$ is the anisotropic index, Dimensionless

$r_{d(x)}$ is the damaged radius, (ft)

$r_w$ is the wellbore radius (ft)

$k_H$ is the horizontal permeability of the reservoir, mD

$k_V$ is the vertical permeability of the reservoir, mD

Accounting for the effect of formation damage on well productivity, the ratio of the productivity index for a damaged well to that of an undamaged well can be deduced using;

$$\frac{J_d}{J} = \frac{\ln\left[\frac{h\,I_{ani}}{r_w(I_{ani}+1)}\right] + \frac{\pi\, y_b}{h\,I_{ani}} - 1.224}{\ln\left[\frac{h\,I_{ani}}{r_w(I_{ani}+1)}\right] + \frac{\pi\, y_b}{hI_{ani}} - 1.224 + S_{(x)}} \qquad (3.03)$$

### 2.1.3 Behr and Raflee Model

In the assessment of reservoir pressure support induced formation damage, the Behr and Raflee particle induced skin account is presented in equation (3.04) below;

$$S_p = S_i\left(\eta_w \frac{r_w}{r_R}\right)^{1-n} + \frac{1}{1-n}\left[\left(\frac{r_e}{r_R}^{1-n} - \frac{r_p}{r_R}^{1-n}\right)\right] + \omega^{1-n}\frac{r_p^{(\beta+1)(1-n)} - r_w^{(\beta+1)(1-n)}}{(\beta)(1-n)\, r_R^{1-n}} - \ln\left(\frac{r_e}{r_w}\right) \qquad (3.04)$$

$$\omega = \frac{1}{r_p^\beta} = \frac{\eta_w}{r_w^\beta} \qquad (3.05)$$

$$\beta = \frac{\ln(\eta_w)}{\ln\left(\frac{r_w}{r_p}\right)} \qquad (3.06)$$

$$r_R = \sqrt{r_w r_a} \qquad (3.07)$$

Where

$S_p$ is the Dimensionless particle induced skin factor

$S_i$ is the Hawkins deduced skin factor
$\eta_w$ is the Dimensionless coefficient of completion for an oil well (0.50)
$r_R$ is the equivalent radius, ft
$r_w$ is the wellbore radius, ft
$r_e$ is the reservoir radius, ft
$r_a$ is the aquifer radius, ft
$r_p$ is the radius of the sandstone particle, ft
n is the dimensionless tortuosity index for porosity range.

Though Equation (3.04) was originally modelled for a polymer injection process, with power law index of injected fluid *n*, this study replaces the power law index with the tortuosity parameter for each case study. The adaptation of the model to this study is validated since the value of the power law index in the study of Behr and Raflee falls within the tortuosity range of the various case studies to the analyzed.
Therefore, the tortuosity of each reservoir sand for an overlapping circular-shaped sandstone formation as approximated in 1989 by Comiti *et al.*(Comiti *et al.*, 1989) will be deduced using Equation (3.08) below;

$$\tau = 1 + \text{ꝑ} ln\emptyset \qquad (3.08)$$

Where
$\tau$ is the dimensionless tortuosity magnitude.
ꝑ is the formation packing factor for sandstone
$\emptyset$ is the formation porosity

### 2.1.4 Ozkan Model

The derived expression for the determination of formation damage magnitude and additional pressure drop caused by the region of altered permeability around the wellbore as presented by Ozkan, (1997) at time, t and distance, r is given by;

$$S_{Om} = \frac{P_{wf_{r,x,t)}} - P_{s_{r,x,t)}}}{\frac{L\, k_{\tilde{r}}}{h\, k}\left(\tilde{r}\frac{\partial p}{\partial r}\right)_{(r,x,t)}} = \frac{\frac{k\,h}{141.2\, q\, \mu\, B}\Delta P_s}{q_D} \qquad (3.09)$$

$$q_D = \frac{q_{sc(r,t)}\, L}{q} = \frac{L\, k_{\tilde{r}}}{141.2\, q\, \mu\, B}\left(\tilde{r}\frac{\partial p}{\partial r}\right)_{(r,x,t)} \qquad (3.10)$$

Where

$$k_{\tilde{r}} = \sqrt{k_y k_x} \qquad (3.11)$$

$P_{wf(r\ ,x,t)}$ is the wellbore flowing pressure at time t, psi
$P_{ws(r,x,t)}$ is the pressure of the radial damaged interval r, at time t, psi
L is the length of the well, ft
$q_d$ is a dimensionless flux quantity
$q_{sc}$ flux at the well surface, bbl/day/ft
$k_{\tilde{r}}$ is the equivalent permeability of the x-y plane.
$\frac{\partial p}{\partial r}$ is the defined pressure derivative obtained from a transient test plot

### 2.1.5 The Conventional Transient Test skin Model

Evaluating the above models, deductions form each model will be compared to a pressure buildup transient test skin model. This is because available field data is made up of pressure buildup parameters among others. The pressure buildup skin model is thus given as;

$$s = 1.151\left[\frac{P_{1hr} - P_{wf}}{m} - \log\frac{k}{\emptyset\, \mu\, c_t\, r_w^2} + 3.227\right] \qquad (3.12)$$

Where
$\emptyset$ is the porosity of the reservoir
μ is the oil viscosity (cp)
$c_t$ is the total compressibility of the reservoir system, ($psi^{-1}$)
$r_w$ is the radius of the wellbore, (ft)
$P_{1hr}$ pressure interpolation on the Horner's plot at dt=1, (psi)
Pwf is the wellbore flowing pressure before shut-in, (Psi)
m is the slope of the Horner's plot, (psi/cycle).

## 2.2 Methods

### 2.2.1 Flow and Productivity Analysis

The candidate standalone models so selected are subjected to a series of flow and productivity analysis. These analyses, having thoroughly evaluated the models on each Niger Delta oil reservoir will provide a basis for the establishment and adaptation of a single model which proves most effective in damage quantification. The versatility comparison of evaluated models will be presented in terms of; Flow efficiency, Total pressure drop due to skin, Damage intensity, Wellbore flow parameters (effective wellbore radius) Economics Other related properties

### 2.2.2 Wellbore Inflow Assessment

#### 2.2.2.1 Effective wellbore Radius Assessment

Evaluation of the effective wellbore radius will considerably show the effect of the formation damage (Skin) on the total pressure drawdown. It presents an analytical approach as to which the wells will be analyzed, putting into consideration the degree of damage around the wellbore vicinity. The mathematical expression for effective wellbore radius is given as

$$r_{eff} = r_w e^{-s} \tag{3.21}$$

Where
$r_{eff}$ is the effective wellbore radius, ft
$r_w$ is the actual wellbore radius, ft
*S* is a dimensionless skin (damage) factor
Deductions from this analysis will present a percentage decrease in wellbore radius for all case studies with each damage model.

### 2.2.3 Economic Viability of Models

The economics of each model for all case studies is analyzed in terms of annual revenue losses per well as a result of formation damage. This approached is to initiate a dynamic analytical tool that will comprehensively account for the prediction and establishment of optimum well planning and development strategies. Hence, annual revenue loss per well model to be adopted for this study is given as;

$$f = 365 q_o \times \beta \times DR \tag{3.22}$$

Where
f = Annual revenue loss per well (USD)
$q_o$ = undamaged flowrate (bbl/day)
β = Current Oil price, $/bbl
DR= Damage Ratio (fractional loss in production)

### 2.2.4 Simulation Studies and Sensitivity Analysis

A Matlab R2012a program is written for the individual models and having accurately defining the variables, a simulation is run for all five cases (ND-1, ND2, ND-3, ND-4 and ND-5). The results so obtained from these simulations will provide a basis for the comparison and subsequent selection of an appropriate damage model peculiar to the Niger delta region. Sensitivity analysis on each model will also provide a thorough understanding of the dependency of the accuracy of each model on certain variables.

## 3. Result and Discussion

The effective wellbore radius analysis gives a radial interpretation of the wellbore when damage to the wellbore vicinity of magnitude S is present. It presents a flow radius open to production for a specified damage magnitude. The lower the formation damage, the closer the effective wellbore radius tends to the actual wellbore radius when skin is equal to zero. The models were evaluated on the basis of their formation damage magnitudes and the effective wellbore radiuses for all five (5) reservoirs were obtained. A graphical interpretation of this analysis is shown in Figure 3.1 where the model for each reservoir is displayed in terms of their flow radius as a function of their damage magnitude.

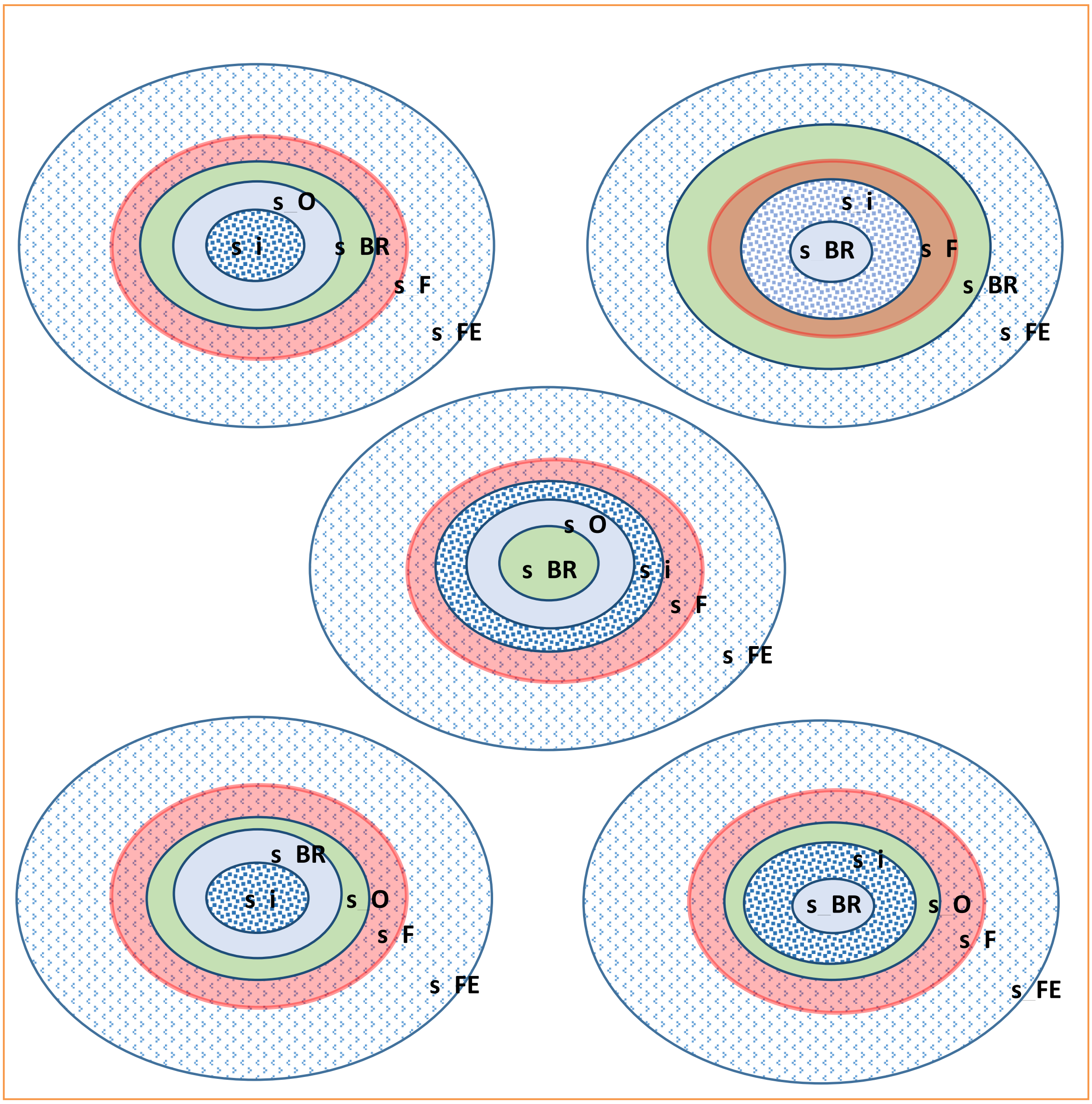


**Figure 3.1: Effective Wellbore Radius for Damage Models of all Five Reservoirs**

From the figure above, it is observed that the Frick and Economides model maintained the highest wellbore radius for all reservoir systems. This is commendable for a radial investigation in flow analysis but these results were only possible because the model ignored some intrinsic parameters. This however questions its application as its adaptation within the region may result in erroneous computations and truncate well productivity predictions. The Furui *et al* model showed a considerable flow radius for virtually all reservoir systems as it recorded a not too high and not to small wellbore radius effective to flow.

### 3. 1 Flow and Productivity Evaluation

Well productivity and flow analysis was conducted on the offshore reservoir ND-5 since it was the only case study with a production data available. The productivity of this reservoir though the production well was done for a 30 days period where all five (5) models were compared to an idealized production (i.e. where skin is assumed to be Zero). This evaluation revealed that even with the standard buildup damage model, significant reduction in well productivity can occur for skin values greater than zero.

Assuming the reservoir had zero damage; the well will deliver 966.k35 stb/day at the start of production and reduce to 946.23 bst/day at the end of 30days. This reduction in production rate is expected because as reservoir pressure is depleted, the wellbore flowing pressure reduces correspondingly. The reference model predicting a skin magnitude of 1.55, having an equivalent pressure drop due to skin of 215.58 psi was observed to have a production rate of 859.93 stb/day at the start of production and 813.10 stb/day after 30 days. This can be shown in Figure 3.1. Relying on the Frick and Economides model would be useless because it almost neglects the effect of skin by recording a lower skin prediction. As seen in the figure below, the Frick and Economides model is closest to the idealized flow plot.

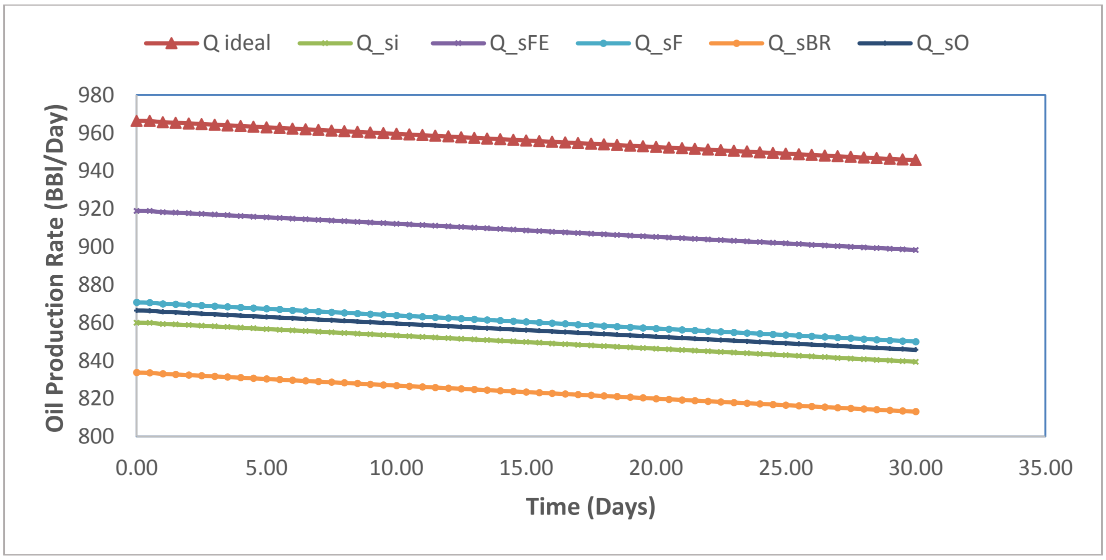


**Figure 3.2: Idealized Flow and Damaged Well Productivity Comparison in Reservoir ND-5 for all Model**

The Ozkan model and that of Fueui *et al* had a close skin magnitude prediction to the reference as their skin induced pressure drops yielded a 866.34 stb/day and 870.64 stb/day at the start of production and 845.71 stb/day and 850.04 stb/ day after 30 days of production respectively. The under estimation of well productivity be the Behr and Raflee model confirms that its application will yield an erroneous prediction in flow performance of the well. From the above plot, the Furui *et al* and Ozkan models can be inferred to suit appropriately for adaptation in the ND-5 reservoir, this is because of their proximity in predictions to that of the reference skin model.

### 3. 2: The Economics of the Damage Models

Neglecting the Frick and Economides model which tends to for all reservoir cases, constantly underestimate formation damage magnitude and skin induced pressure drop, underestimate damage intensity and overestimate well flow efficiency and well productivity, the economic evaluation of the models for appropriate selection will be based on results obtained from others. (Ozkan, Furui *et al*, and Behr & Raflee).

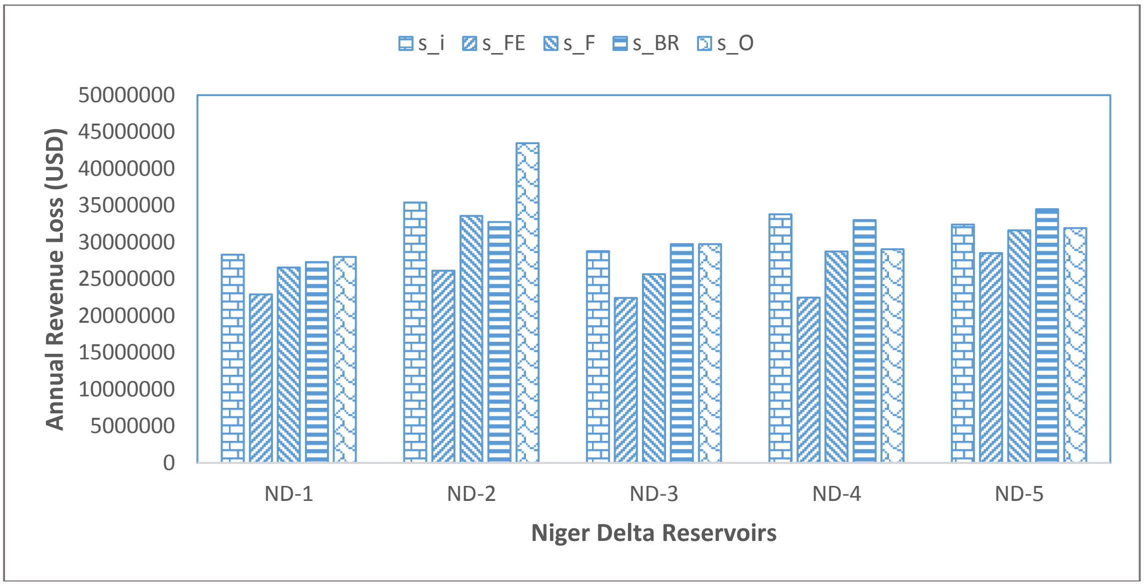


**Figure 3.3: Summary of Damage Models in Terms of Annual Revenue Loss for all Reservoirs**

Figure 3.3 shows the annual revenue loss deductions in US dollars for each model applied to all reservoirs. Here, we observe that for all reservoir cases, the Behr and Raflee model recorded the most losses due to its damage magnitude. Though not significantly uneconomical in reservoir ND-2 where it had an average loss of $32.7M compared to $ 43.5M for the Ozkan model, annual loss for this model was $28.03M, $29.59M, $33.07M and $34.50M for ND-1, ND-3, ND-4 and ND-5 respectively. These when compared to other models seems to be not economical. The Ozkan Model .proved more expensive next to the Behr and Raflee model as it records a slightly lower average revenue loss for all five cases. Having considered all other factors, the Furui et al model proves to be the best choice in model selection in terms of economic implications. This is because, a comparative analysis reveals that it averagely tends to minimize the annual revenue loss relative to the other models, recording a $26.60M, $33.58M $25.65M, 28.77 and $31.72M for reservoirs ND-1, ND-2, ND-3, ND-4 and ND-5 respectively.

### 3. 3: Sensitivity Analysis.

Sensitivity analysis on the effect of wellbore radius on the degree of formation damage for all the models was conducted on the ND-% reservoir. One reservoir was used for this analysis because the skin response for each model in a reservoir will translate the same trend in others. Variation in wellbore radius deduced in Table B8 of APPENDIX-B revealed that some models will maintain their skin magnitude irrespective of the change in well bore radius and others will vary.

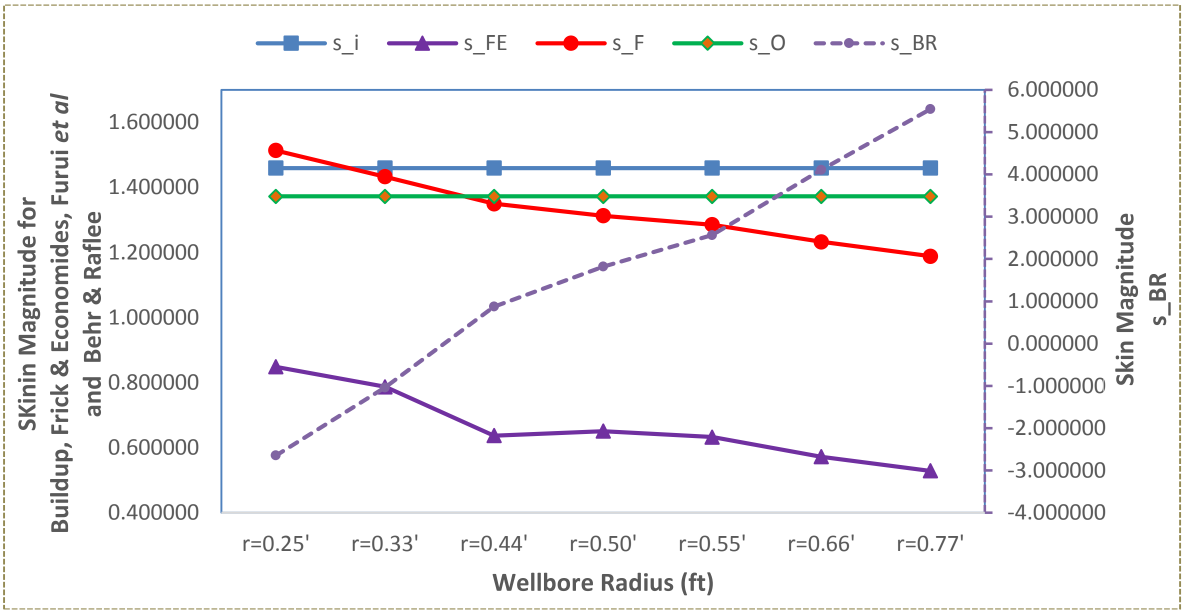


**Figure 3.3: Sensitivity Analysis for the Effect of Wellbore Radius Variation on Damage Models**

From Figure 3.3, it is observed that the reference model and that of Ozkan remained constant for all seven values of wellbore radius. This is as a result of the independence of these models on the wellbore radius. Significant changes in skin and formation damage is observed for the Furui *et al* model as it if a function of the radius of the producing wellbore. Before now, the Behr and Raflee model have been thought to be adaptable in the region but the sensitivity evaluation revealed that absurd values of skin can be generated on evaluation using the Behr and Raflee as it tends to show well stimulation values of skin for wellbore radius of 0.25ft and 0.33ft. This limits its application and tends to streamline choices of model for the Niger Delta region.

## 4. Conclusion and Recommendations

The furui *et al* model showed a better effective wellbore radius that can permit more fluid influx into the producing well from the reservoir by recording larger values apparent wellbore radius for all reservoirs besides that of ND-2. Though the Ozkan model proved more prominent in the well productivity test as it tended to almost juxtapose with the production profile of the buildup obtained skin model, sensitivity analysis on variation in wellbore radius of the producing well revealed that skin magnitudes from the Furui *et al* model which is primarily a function of reservoir anisotropy will decrease with increasing wellbore radius. The variations in wellbore radius also established the ascensions that since the buildup obtained skin model and the Ozkan model is not a function of wellbore radius, their skin prediction will be constant for all well radiuses. This analysis, however, streamlined the evaluation to just the Furui ae al model and the Ozkan model as the Behr and Raflee model showed absurd responses by predicting a stimulated skin value for a radius of 0.25 ft and 0.33 ft and overestimated skin magnitude avove 0.33ft.

The final analysis confirmed the establishment of the Furui *et al* model as the most adaptive within the Niger Delta region. The economics of the oil and gas prospects is given so much preference as it informs production and optimization techniques to be adopted. Economic evaluation of these models showed that an average annual revenue loss of about 29.24 million U.S Dollars can be incurred with the Furui *et al* model. This loss when compared to the others proved a better option as the model of Ozkan and that of Behr & Raflee yielded an average revenue loss of about $32.44 million and 31.46 million U.S Dollars respectively. The reference model even proved more expensive than the established model, having an average annual revenue loss of about $31.74 million. Below is a summary of formation damage performance after evaluation.

**Table 4.1: Summary of Formation Damage Analysis.**

| Formation Damage Model | Avg. Annual Revenue loss USD | Pressure Drop due to Skin (Psi) for ND-5 | Avg. Flow Performance Flow Efficiency (%) | Average Damage Intensity (Damage Factor) |
|---|---|---|---|---|
| Buildup | 31738347 | 215.5824 | 0.64580 | 0.35420 |
| Frick & Economides | 24486214 | 96.15746 | 0.82880 | 0.17120 |
| Furui *et al* | 29243058 | 193.9843 | 0.69400 | 0.30600 |
| Behr and Raflee | 31460576 | 268.8243 | 0.64820 | 0.35180 |
| Ozkan | 32443058 | 202.7447 | 0.63770 | 0.36230 |

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