MARGINAL FIELD DEVELOPMENT: OPPORTUNITIES AND CHALLENGES

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ABSTRACT
A marginal field is an oil/gas field discovered to contain hydrocarbon deposit but left fallow for a period exceeding ten years. Such fields are awarded to Nigerian independent companies in order to encourage local participation in the upstream sector and increase the country’s hydrocarbon reserve base and production capacity. The first marginal field licensing round was in 2003. Some of the awardees have developed their fields and have commenced production while others are at different levels of development. Marginal fields have increased Nigeria's oil/gas reserve base and production capacity thereby increasing revenue for the nation. Many Nigerians have become Managing Directors/Chief Executive Officers as well as other top positions in the upstream sector through the marginal field policy. The policy has thus increased local capacity in the upstream sector. Despite the huge opportunities inherent in marginal field, there are many challenges facing the development of such fields. This work reviewed the opportunities that marginal fields present to Nigerians and Nigeria as a country. The work also studied the challenges facing marginal field development in Nigeria and presented recommendations on how to mitigate such challenges.

INTRODUCTION
In Nigeria, lease administration was originally designed in favour of the International Oil Companies (IOCs). This made access to oil/gas assets very difficult for Indigenous/Independent Operators.

IOCs left significant Oil & Gas Resources unappraised/unproduced many years after discovery for several reasons.

The Petroleum (Amendment) Decree No. 23 of 1996 was enacted to award such fields as “marginal” to Indigenous Companies.

The first marginal field licensing round was in 2003 where twenty four fields were awarded to 31 Companies. These fields are presently at various stages of development with some already producing.

LEGAL FRAMEWORK FOR MARGINAL FIELD DEVELOPMENT
The Marginal Field program is based on the Petroleum (Amendment) Act No 23, 1996.

PETROLEUM (AMENDMENT) ACT NO 23, 1996
A key policy of government was to enhance growth in the exploration and production of petroleum resources. In implementing this policy, government paid particular attention to a number of reported oil and gas discoveries that exist in the country, especially, the Niger Delta, some of which have been left unattended for very many years. In most cases, they have remained unproduced and only in a few cases partially appraised.

The consequence of the above was the enactment of the Petroleum Act as amended and cited as Act No. 23 of 1996 which grants access, specifically by indigenous companies, to operate and produce these un-attended fields. The marginal field policy is based on this act.

OBJECTIVES OF THE MARGINAL FIELD POLICY
i. Promote indigenous participation in the sector thereby fostering technological transfer.
ii. Provide opportunity to gainfully engage the pool of high level technically competent Nigerians in the oil & gas sector.
iii. Grow production capacity by expanding the scope of participation in Nigeria’s Petroleum industry, especially, the upstream sector, through diversification of resources and inflow of investments.
iv. Increase oil and gas reserves base through aggressive exploration and development efforts, in particular the deeper hydrocarbon plays.
v. Provide opportunity for portfolio rationalization.
vi. Promote common usage of assets/facilities to ensure optimum utilization of available capacities.

**DEFINITIONS OF MARGINAL FIELD**
A marginal field is any field that has oil and gas reserve booked and reported annually to the Department of Petroleum Resources (DPR) and has remained unproduced for a period of over 10 years.

Specifically, marginal fields have some or all of the following characteristics:

i. Fields not considered by license holders for development because of assumed volatile economics under prevailing fiscal and market conditions.
ii. Fields with at least one exploration well drilled and reported as oil and or gas discovery for more than 10 years with no follow up appraisal or development effort.
iii. Fields with crude oil characteristics different from current streams (such as crude with very high viscosity and low API gravity), which cannot be profitably produced through conventional methods or current technology.
iv. Fields with high gas and low oil reserves.
v. Hitherto producing fields that have been abandoned by the leaseholders for upwards of three years for economic or operational reasons.
vi. Fields that the present leaseholders may consider for farm-out as part of portfolio rationalization programs.

**OUTCOME OF THE 2003 MARGINAL FIELD AWARDS**
In 2003, 24 marginal fields were awarded to 31 companies. The fields are presented in table 1 below:

**Table 1: 2003 Marginal Field Award Structure (Osahon 2013)**

<table>
<thead>
<tr>
<th>S/N</th>
<th>FIELD</th>
<th>FARMOR</th>
<th>OML</th>
<th>FARMEE</th>
<th>TERRAIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Asuokpu/Umutu</td>
<td>Shell</td>
<td>38</td>
<td>Prime Energy (51%) / Suffolk Petroleum (49%)</td>
<td>Swamp</td>
</tr>
<tr>
<td>2</td>
<td>Asaramatoru</td>
<td>Shell</td>
<td>11</td>
<td>Walter Smith (70%) / Morris Petroleum (30%)</td>
<td>Land</td>
</tr>
<tr>
<td>3</td>
<td>Atala</td>
<td>Shell</td>
<td>46</td>
<td>Bayelsa Oil (100%)</td>
<td>Swamp</td>
</tr>
<tr>
<td>4</td>
<td>Eremor</td>
<td>Shell</td>
<td>46</td>
<td>Excel E&amp;P (100%)</td>
<td>Swamp</td>
</tr>
<tr>
<td>5</td>
<td>Ibigwe</td>
<td>Shell</td>
<td>16</td>
<td>Millenium Oil (100%)</td>
<td>Land</td>
</tr>
<tr>
<td>6</td>
<td>Ofa</td>
<td>Shell</td>
<td>30</td>
<td>Network Oil &amp; Gas (100%)</td>
<td>Land</td>
</tr>
<tr>
<td>7</td>
<td>Oza</td>
<td>Shell</td>
<td>11</td>
<td>Universal Energy (100%)</td>
<td>Swamp</td>
</tr>
<tr>
<td>8</td>
<td>Qua Ibo</td>
<td>Shell</td>
<td>13</td>
<td>Associated (51%) / Dansaki Pet (49%)</td>
<td>Offshore</td>
</tr>
<tr>
<td>9</td>
<td>Stubb Creek</td>
<td>Shell</td>
<td>14</td>
<td>Sahara (51%) &amp; AOG (49%)</td>
<td>Swamp</td>
</tr>
<tr>
<td>10</td>
<td>Tom Shot Bank</td>
<td>Shell</td>
<td>14</td>
<td>Guarantee Oil / Owena Oil</td>
<td>Offshore</td>
</tr>
<tr>
<td>11</td>
<td>Tsekelewu</td>
<td>Shell</td>
<td>40</td>
<td>Sogenal (100%)</td>
<td>Offshore</td>
</tr>
<tr>
<td>12</td>
<td>Uquo</td>
<td>Shell</td>
<td>13</td>
<td>Frontier Oil (100%)</td>
<td>Swamp</td>
</tr>
<tr>
<td>13</td>
<td>Ororo</td>
<td>Chevron</td>
<td>95</td>
<td>Britania –U (100%)</td>
<td>Offshore</td>
</tr>
<tr>
<td>14</td>
<td>Akepo</td>
<td>Chevron</td>
<td>90</td>
<td>Bicta (100%)</td>
<td>Offshore</td>
</tr>
<tr>
<td>15</td>
<td>Ogedeh</td>
<td>Chevron</td>
<td>90</td>
<td>Sogenal (100%)</td>
<td>Offshore</td>
</tr>
<tr>
<td>16</td>
<td>Ajapa</td>
<td>Chevron</td>
<td>90</td>
<td>Britania –U (100%)</td>
<td>Offshore</td>
</tr>
</tbody>
</table>
OTHER MARGINAL FIELD AWARDS

- Awards of Okwok field in 2006 and Ebok field in 2007 to Oriental Energy were made to compensate the company for losing part of its OML 115 to Equatorial Guinea due to boundary adjustment.

- Ogbelle field was awarded to the Niger Delta Petroleum Resources Limited in 1999. The company was the first beneficiary of marginal field in the country.

- In 2010, Otakikpo and Ubita fields were awarded to Green Energy Ltd and Allgrace Energy Ltd respectively as part of a lingering award process that commenced in 2004.

SCORECARD OF MARGINAL FIELD INITIATIVE

Out of the 24 + 5 marginal fields, twelve have started production.

The twelve producing fields are:
1. Umusadege (Midwestern Oil & Gas)
2. Umusati (Pillar Oil)
3. Ibigwe (Waltersmith)
4. Egbaoma (Platform Petroleum)
5. Obodugwa / Obodeti (Energia Petroleum / Oando)
6. Ajapa (Britania-u)
7. Ogbelle (Niger Delta Petroleum)
8. Ebok (Oriental Energy)
9. Uquo (Frontier) 1st Marginal Gas Operator
10. Asaramatoru (Prime Exploration)
11. Stubb Creek (Universal Energy)
12. Qua Ibo (Network Oil and Gas)

RESEARCH METHODOLOGY

Data were obtained from the database of Department of Petroleum Resources (DPR) and Nigerian National Petroleum Corporation (NNPC). These data were analyzed with charts generated, using Microsoft Excel.

RESULTS/DISCUSSION

Figure 1 shows how marginal field contribution to total crude oil production in Nigeria increased from 0.09% in 2006 to 3.01% in 2015.

In terms of volume, marginal field production increased from 2,366bopd in 2006 to 70,274bopd in 2015 (figure 2).
Gas production data was not available from 2006 to 2010. From 2011 to 2015, gas production increased from 4.2mmscfd to 150mmscfd as shown in figure 3.

The production distribution chart of figure 4 shows that marginal field contributed about 3% to Nigeria’s total crude oil production for the year 2015. Joint Venture contracts gave the highest contribution of 48%. The least percentage (about 1%) was contributed by the Service Contract type.

OTHER BENEFITS OF MARGINAL FIELD
- Integrating value
  - Producing crude oil
  - Monetizing gas
  - Small scale refining
- Unlocking stranded molecules through deployment of new technologies
- Creating opportunity for employment and empowerment
- Better handle of local communities

CHALLENGES FACING MARGINAL FIELD DEVELOPMENT/OPERATIONS
- Low oil prices
- Insecurity
- Deferred production due to attacks by militants
- Shortage of foreign exchange (Forex)
- Fiscal issues that pertain to royalty and Petroleum Profit Tax (PPT)
- Community problems
- Assets are sub-economic and hardly bankable

REMEDIES TO THE CHALLENGES FACING MARGINAL FIELD DEVELOPMENT/OPERATIONS
- Optimization of resources to minimize operating cost and capital cost.
- Collaboration with security agencies and host communities.
- Sharing and collaboration among clusters of contiguous fields.
- Amnesty for militants.
CONCLUSION/RECOMMENDATIONS

The marginal field program has provided so much opportunity to Nigerians and Nigeria as a country. Despite the challenges facing marginal field operators, they have continued to provide employment for Nigerians and increase local capacities. The marginal field program contributes considerable volume to the nation’s production capacity and reserve base. As at 2015, marginal field contributes about 3% of Nigeria’s total crude oil production. With production ramp up and more marginal fields commencing production, this figure would likely approach or even exceed 4% in 2017.

Challenges inherent in marginal field development/operations should be continuously analyzed and appropriate interventions put in place. Introducing enablers in subsequent Marginal Fields Bid Round would be very helpful. More Nigerians should take advantage of the Marginal Field policy and invest in the program.

REFERENCES


LIST OF ABBREVIATION

Bopd Barrel Oil Per Day
mmscfd Million Standard Cubic Feet per Day
OML Oil Mining Lease
N/A Not Available