

CRANFIELD UNIVERSITY

JACK PEGRAM

**AN INVESTIGATION INTO JOB ROLE LOCALISATION IN THE
OIL AND GAS INDUSTRY: A CASE STUDY**

SCHOOL OF ENERGY AND POWER
MSc by Research in Energy and Power

MASTER OF SCIENCE BY RESEARCH
Academic Year: 2017 - 2018

Supervisors: Prof. Gioia Falcone and Dr. Athanasios Kolios
Industry Adviser: Dr. Jonathan Craig, Senior Vice President,
Exploration Strategies & Professional Areas, Eni S.p.A
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ABSTRACT

This study investigates the viability of localising job roles in the oil and gas industry and whether job role localisation can reduce staffing costs. The principal barrier to job role localisation is high standards required by oil and gas companies and immature labour markets that do not meet these standards.

A four stage mixed methods approach is taken. The first stage addresses the global level using a survey about local content issues. The second stage focuses on the national level using interviews to investigate how national factors can affect job role localisation. The third stage addresses the company level, using a decision tree methodology on a sample of ten job roles within one oil and gas company operating in Ghana to assess the viability of localising particular job roles. The fourth stage uses training and development investment timelines to model whether the costs of employing expatriates are greater than training, developing and employing Ghanaians to do the same job roles.

The findings show that different stakeholders often share opinions about local content issues. At the national level there are many national context specific factors that affect job role localisation including legislations, culture, attitudes and experience within the labour market. The decision tree methodology developed in this study is an effective tool to assess the viability of localising different job roles over time. Training and development investment timelines show that it is more cost-effective to invest in the education, training and development of local people than it is to employ expatriates.

This study finds that localisation is becoming increasingly prevalent worldwide. Oil and gas companies must adapt their localisation strategies to the national context where they are operating. Whilst not all job roles should be localised, decision trees can support companies to decide which job roles should be localised. Furthermore, companies can reduce costs if they train, develop and employ local people rather than employing expatriates.

Keywords: Oil and gas, Ghana, Eni, succession planning, localisation, local content, job role localisation, decision tree analysis, training, HR, expatriates

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LIST OF ABBREVIATIONS

E&P	Exploration and production
ECU	Eni Corporate University
EMV	Expected monetary value
Eni	Eni S.p.A.
Eni Ghana	Eni Ghana Exploration and Production Limited
FPSO	Floating Production Storage and Offloading
GNPC	Ghana National Petroleum Company
GoG	Government of Ghana
HR	Human Resources
HSE	Health, safety, and environment
IFC	International Finance Corporation
IKTVA	In-Kingdom Total Value Add
IOC	International oil company
JRL	Job role localisation
L.I.-2204	Petroleum (Local Content and Local Participation) Regulations, 2013 (L.I.-2204)
LCDP	Local Content Development Plan
MNC	Multi-national corporation
NOC	National oil company
NPV	Net present value
O&G	Oil and gas
OCTP	Offshore Cape Three Points
RETP	Recruitment, Employment and Training Plan
SPE	Society of Petroleum Engineers
TVET	Technical and vocational education training
USD	United States Dollars
WACC	Weighted average cost of capital

1 Introduction

1.1 Background and research problem

1.1.1 Research problem

Job role localisation (JRL) is the replacement of expatriates by competent host country nationals (Potter, 1989). JRL has significant business benefits; however achieving successful JRL has major challenges. Within the oil and gas (O&G) industry specifically, JRL is increasingly becoming an imperative for O&G companies.

Worldwide, O&G companies are required to localise job roles in order to comply with host government's local content legislations. Local content legislations are employed to encourage value-addition to the economy by enabling cross-sector linkages, increasing local participation and avoiding negative economic impacts associated with O&G activities. Within local content legislations, JRL is required of O&G companies to increase the number of local people employed within the sector.

O&G companies frequently face stringent local content targets, with tight timelines and pressure from both government and society to provide local jobs. This is particularly challenging for O&G companies operating in nascent hydrocarbon producing countries, where there is often a lack of local people with the required experience within the labour market. This study seeks to address this problem by investigating the viability of JRL and by assessing whether JRL can reduce costs for O&G companies.

1.1.2 Background to the study

A large body of existing research describes how O&G and other extractive industries can stimulate employment, encourage local entrepreneurship, reduce poverty, increase knowledge creation and generate economic prosperity (Gbegi & Adebisi, 2013; Mifsud-Bonnici, 2013; Sigam & Garcia, 2012). The O&G industry has the opportunity to transform economies due to its capital intensive nature (Alba, 2009).

Achieving this meets the values of the three principal stakeholders; the government, O&G industry and domestic population. Governments seek lasting economic growth from O&G production; local people seek tangible prosperity and O&G companies seek profit maximisation for shareholders (Werner, Inkpen, & Moffett, 2016). Specifically localising jobs is valued by governments as the number of economic contributors is increased, leading to a knowledge-based economy and multiplier effects within the economy (Kim, Asta Lohde, van Moorsel, & Rebolledo Dellepiane, 2017). For local people, they access employment opportunities, increase their competencies and become internationally competitive. For O&G companies, they are viewed positively amongst the local population, their own employees, the government, and have the potential for cost reductions (Fayol-Song, 2013).

There are many barriers to localising job roles, such as limited experience, qualifications and skill levels within the local labour market, a lack of understanding amongst local people of the parent organisation culture and the preference of employing expatriates by Multi-National Corporations (MNCs) (Al-Waqfi & Forstenlechner, 2014; Wong & Law, 1999). The risks of employing inexperienced, incompetent and under-qualified people can have a devastating impact on the environment and human life in the event of a disaster occurring, as well as impacting the reputation and finances of O&G organisations (Wilson & Kuszewski, 2011). O&G companies therefore are notoriously risk averse when it comes to recruitment, selection and succession planning.

However, despite these challenges, it has been argued that successful localisation of the workforce has more advantages than disadvantages (Fryxell, Butler, & Choi, 2004; Hailey, 1996; Law, Song, Wong, & Chen, 2009). JRL is a solution to expatriate failure rates, improving rapport and confidence amongst national staff which in turn increases retention rates and improves government relations (Karam, Jayashree, & Lindsay, 2015; Selmer, 2003). Furthermore, many academics claim that JRL reduces costs (Fayol-Song, 2013; Kobrin, 1988).

The O&G industry suffers from commodity price fluctuations, which impact the budgets of host nations and O&G companies (Baumeister & Kilian, 2016). In recent years, the oil price has dropped from \$115 USD in 2014 to a low of \$35 USD in 2016. This has led to a reduction in O&G project activities and less investment in education and training (Henriques & Sadorsky, 2011). As a result, O&G companies have sought increased efficiency and to reduce their costs. Additionally, O&G companies face other challenges when planning their local content, localisation and JRL strategies. For example what is the definition of 'local' (Nwapi, 2015)? How much localisation should be pursued (Kobrin, 1988)? Whose responsibility is it to increase the employability of nationals to enable companies to localise job roles (Swailles, Al Said, & Al Fahdi, 2012)?

1.1.3 Introducing the case study

In order to address these issues, this study focuses on Ghana as an example of a country that requires JRL within its O&G local content legislations. Ghana discovered commercial O&G quantities in 2007 and commenced production in 2010 (Ablo & Overå, 2015). Therefore, the O&G industry is relatively new to Ghana, with three active offshore producing O&G projects. The government of Ghana (GoG) aspires for lasting economic prosperity as a result of O&G activities and have implemented stringent local content regulations.

Existing literature to date about local content in Ghana largely addresses the effectiveness of Ghana's local content policies (Ayelazuno, 2014; Gyampo, 2011; Kopiński, Polus, & Tycholiz, 2013; Obeng-Odoom, 2013, 2014). The literature suggests that O&G companies struggle to access a workforce with the skills and experience required, as the education system does not provide these skills (Arthur & Arthur, 2014; Playfoot, Augustus, & Andrews, 2017).

This research focuses on one O&G company operating in Ghana as a case study: Eni Ghana Exploration and Production Limited (Eni Ghana). Eni Ghana is a subsidiary of Eni S.p.A. (Eni), which is an energy company headquartered in Italy with O&G exploration and production activities in 44 countries, and 33,000 employees worldwide (Eni, 2017d). In July 2017, Eni Ghana achieved 'first oil' in the Offshore Cape Three Points (OCTP) project (Kpodo, 2017). OCTP has an

operational phase of 17 years. Eni Ghana is required to achieve 90% localisation within the first ten years of operation in order to comply with the GoG's local content regulation, L.I.-2204 (Petroleum Commission, 2013). Planning their strategy for localising the workforce is a major priority for Eni Ghana. This research aims to support Eni Ghana's localisation strategy with wider applicability to Eni's future projects.

Different stakeholders perceive localisation in different ways and this research particularly focuses on the perspective of the O&G company.

1.1.4 Existing literature

Whilst there many studies about the localisation of job roles (Harry, 2007; Law et al., 2009; Williams, Bhanugopan, & Fish, 2011), local content within the oil, gas and extractive industries (Ana Maria Esteves & Barclay, 2011; Marcel, Tissot, Paul, & Omonbude, 2016; Tordo, Warner, Manzano, & Anouti, 2013) and local content in Ghana's burgeoning O&G industry (Ablo, 2015; Oppong, 2015; Ovadia, 2016; Senoo & Armah, 2015), there is a scarcity of empirical research about the viability of localising roles, particularly within the O&G sector (Rees, Mamman, & Braik, 2007). Furthermore, there is a dearth of empirical research focused on JRL within Africa, and specifically Ghana's O&G sector. This research uses a case study of one O&G company operating in Ghana to address this gap within the literature.

1.2 Thesis structure

Chapter one provides an introduction to the research question, describing the setting for the case study. An overall structure to the thesis is given.

Chapter two contextualises this research within the existing literature, providing a critical review of local content and localisation literature. It includes a review of the principal factors affecting JRL, Ghana's O&G sector and an overview of Eni Ghana.

Chapter three outlines the research aim, the four hypotheses and their associated objectives.

Chapter four provides an explanation of the research methodology. This study employs a mixed methods approach.

Chapter five sets out the results associated with each of the four hypotheses.

Chapter six is a discussion of the results, providing a hypothetico-deductive description of each hypothesis and recommendations based on an integration of all the results.

Chapter seven is the conclusion, providing an overview of the significance of this study's findings and recommendations for future work.

2 Literature Review

2.1 Introduction

Extractives industry literature focusing on local content, localisation and JRL transcends different fields including economics, development studies, geography and business studies. As this research focuses on issues that are managed by the local content and human resources (HR) departments of Eni Ghana, this review is largely limited to the local content and HR literature.

The majority of existing local content studies within extractive industries have focused on mining (Kim et al., 2017). One reason for this seems to be the challenge of gaining access to secondary empirical data within the O&G sector (Harry, 2007). As a result studies that assess the impact of O&G often utilise generalised means of analysis such as multipliers, input-output tables and GDP statistics (Tordo et al., 2013). This literature review primarily focuses on the O&G sector, but draws upon the broader extractive industry due to the parallels between O&G and mining sectors.

The literature review has four principal sections. The first section is focused on definitions. The second section examines local content drivers and theoretical underpinnings. This includes details of local content in Ghana's O&G sector and Eni's situation in Ghana. The third section considers JRL literature examining the reasons why companies localise job roles and what the barriers are to localisation. The fourth section discusses extant examples of measuring, monitoring and planning local content.

2.2 Defining local content, localisation and job role localisation

Three definitions are required for this study: 'local content', 'localisation' and 'job role localisation'.

2.2.1 Defining local content

There is no single agreed definition of local content. Local content is a legislation that requires companies to increase value in the economy through technology-transfer, local supply chain utilisation and the provision of local employment opportunities.

Four definitions of local content are included in Table 1. The first two are from local content best practice papers that are widely used by the O&G industry. As this research focuses on Eni's presence in Ghana, Eni's and the Petroleum Commission's definitions are also included.

Table 1: Definitions of 'local content' (source: various)

Reference	Definition of 'Local content'
IPIECA, 2016, p. 8	"The local resources a project or business utilizes or develops along its value chain while invested in a host country."
Tordo et al., 2013, p. 1	"The extent to which the output of the extractive industry sector generates further benefits to the economy beyond the direct contribution of its value-added, as through links to other sectors."
Eni, 2016d, p. 9	"Added value brought to a host nation (or region or locality) through workforce development, employment of local workforce; and training of local workforce; and investments in supplier development ... and procuring supplies and services locally."
Petroleum Commission, 2017	"The quantum/percentage of locally produced materials, personnel, financing, goods and services rendered to the oil industry and which can be measured in monetary terms."

2.2.2 Defining localisation

Local content differs from localisation. In globalisation theory, localisation refers to how MNCs adapt to local needs, tastes and expectations. For Hines (2000, p. 21) “localisation is a process which reverses the trend of globalization by discriminating in favour of the local” and for Shuman (2013, p. 6) localisation “means nurturing locally owned businesses which use local resources sustainably, employ local workers at decent wages and serve primarily local consumers”.

Localisation in HR theory and localisation in globalisation theory are distinctive issues. Localisation within the HR literature refers to the replacement of expatriate management staff by competent local people. Localisation is often used interchangeably with workforce localisation, nationalisation and management localisation (Oppong, 2015; Selmer, 2004) and is specifically focused on employment. In contrast, definitions of localisation in the globalisation literature refer to products, goods and services (Potter, 1989). Table 2 details five definitions of localisation within the HR context, highlighting the similarities in definition across different authors.

Within O&G, Playfoot et al. (2017, p. 7) combine the globalisation and HR theories by suggesting that localisation is “the operation of an O&G producing business which functions sustainably and profitably in the local environment. Its operation contributes to building a local supply chain, maximises the use of local staff resources by strengthening education and training institutions and drives local procurement of goods and services”.

Table 2: Definitions of 'job role localisation' (source: various)

Reference	Definition of 'Localisation' in HR context
Potter, 1989, p. 26	"Effective localisation has occurred when a local national is filling a required job sufficiently competently to fulfil organisational needs".
Wong & Law, 1999, p. 26	"Localization refers to the development of job related skills within the local population and the delegation of decision-making authority to local employees, with the final objective of replacing expatriate managers with local employees".
Selmer, 2004, p. 1094	"Localization refers to the extent to which jobs originally held by expatriates are filled by local employees who are competent to perform the job".
Bhanugopan & Fish, 2007, p. 366	"Localization is a process in which local officers increase their competencies and consequently improve their performance. The main objective is to train and develop locals to enable them to replace expatriates with competency and efficiency".
Petroleum Commission, 2016, p. 3	"Localisation is a process of developing and utilising local human resources, local skills and expertise in Ghana's oil and gas industry, as opposed to the use of expatriate skills".

2.2.3 Researcher definitions

Differentiating local content, localisation and JRL is therefore central to this study. Drawing upon the above information, Table 3 provides researcher definitions of local content, localisation and JRL for this study.

Table 3: Researcher definitions of local content, localisation and job role localisation

Term	Definition within this study
Local content	A legislation applied by governments of hydrocarbon producing nations to add value to the economy by requiring companies to employ nationals and source goods and services nationally.
Localisation	The practice of building the capacity of and utilising a national supply chain and developing and employing a national workforce to meet or surpass legislated local content targets.
Job role localisation (JRL)	The process of training and developing nationals with the appropriate education, competencies and experience to enable O&G companies to replace expatriates with nationals.

2.3 Local content

2.3.1 Introducing local content policies

Local content policies require O&G companies to implement local capacity building initiatives and to train and employ local people and source local goods, services and materials. This can create economic growth and stimulate linkages with other sectors and lead to economic diversification (Ado, 2013; Morrissey, 2012).

In recent years, governments have shifted their focus away from only revenue generation from taxes to a more long term approach by using local content legislations to generate linkages (Amoako-Tuffour, Aubynn, & Atta-Quayson, 2015). Over 90% of resource-producing countries have local content legislations (Dobbs et al., 2013). Local content legislations have been implemented to different extents and with varying levels of success (Ado, 2013).

O&G project lifecycles can be decades long, meaning that they have the potential to have long-lasting impact. However host Governments party leadership can change every four years and the local management of O&G companies frequently change too (Fayol-Song, 2013). These issues can impede the effectiveness of local content legislations and their implementation.

The majority of existing local content research has primarily examined local supply chains over local employment (Ablo, 2015; Arthur & Arthur, 2014; Ayentimi, Burgess, & Brown, 2016; Ovadia, 2014; Warner, 2011). Despite the limited research into local employment, local content policies have the opportunity to advance the domestic knowledge base through building the competencies and capabilities of local people to become internationally competitive (Arthur & Arthur, 2014; Heum, 2008).

2.3.2 Drivers for local content

Governments principally employ local content policies to stimulate value-added activities that increase the utilisation of domestic goods and services and encourage local employment to replace foreign alternatives (Tordo et al., 2013).

Furthermore, effective local content policies can lead to strong linkages with other sectors and lead to positive spill-over effects (Mifsud-Bonnici, 2013). Local content seeks to retain O&G benefits locally. Without such policies this frequently does not happen, largely due to O&G companies' existing international workforce and procurement practices (Kinnaman, 2011).

Local content is one of the main methodologies employed by governments to avoid the 'resource curse', which refers to the reduction in economic growth from O&G activities (Auty, 2001a, 2001b; Gelb, 1988; Karl, 1997). One aspect of the 'resource curse' is the risk of 'Dutch disease', when the "resource movement effect" causes capital and labour to be focused on the O&G industry. This can lead to a 'crowding out' of existing sectors such as agriculture, which reduces the competitiveness of local goods and services (Corden & Neary, 1982; Humphreys, Sachs, & Stiglitz, 2007; Sachs & Warner, 2001). This is exacerbated by global fluctuations in O&G price, leading to a dependence on O&G revenues (Amundsen, 2013). The impact of the 'resource curse' and 'Dutch disease' on economies in an emerging O&G industry has been well documented (Allcott & Keniston, 2017; Badeeb, Lean, & Clark, 2017; Benjamin, Devarajan, & Weiner, 1989; Gylfason & Nganou, 2016).

Local content policies encourage the participation of local companies and increases direct, indirect and induced employment of local people (Bacon & Kojima, 2011). However, whilst the O&G industry is highly capital intensive, it does not guarantee extensive job creation, due to minimal labour requirements. Employment and local procurement opportunities are therefore negligible. This can lead to frustration and pressure from the domestic population if they do not feel tangible trickledown benefits from O&G activities (Gylfason, 2001; Gylfason & Zoega, 2006; Mehlum, Moene, & Torvik, 2006; Sachs & Warner, 1995; Tordo et al., 2013). Avoiding this is a driver for governments and O&G companies to ensure the effectiveness of local content policies.

2.3.3 Avoiding local content failures

Local content has had mixed successes worldwide. Notably many African nations have not maximised the exploitation of their natural resources for the benefit of local people (Arthur & Arthur, 2014).

Successful models of local content worldwide include Botswana, Norway, Chile, Malaysia and Indonesia, in contrast to those which have not such as Nigeria, Chad and Angola (Mehrara, Alhosseini, & Bahramirad, 2009). Considering country specific contexts is important in understanding why local content strategies succeed or fail (IPIECA, 2016).

Norway is widely considered the most successful example of a country creating lasting positive impacts from its O&G activities. Norway's robust policies, strong institutions, quality education system and industrial background has supported the country's economic transformation (Nordås, Vatne, & Heum, 2003). However, Heum (2008) argued that replicating Norway's experience is virtually impossible for new O&G producing nations. Despite this, lessons can be learned from international successes and failures.

In a study of local content implementation across six countries, Nordås et al. (2003) found policy design and implementation to be the crucial factor. Despite the wealth of natural resource across Sub-Saharan Africa and the fact that governments have put significant efforts into attracting MNCs, many nations have not benefited from the resources due to poor execution of policies (Ayentimi et al., 2016; Ngowi, 2000).

Institutional quality, strength and transparency are critical therefore to ensuring that policies are effectively managed and monitored (Collier & Goderis, 2008; Kaznacheev, 2013). Weak institutions can lead to 'voracity effect', whereby governments overreact to the O&G revenues causing reduced economic growth (Lane & Tornell, 1996; Oomes & Kalcheva, 2007). Furthermore there is a risk of rent seeking behaviour, corruption and autocratic governance (Hansen, Buur, Therkildsen, & Kjær, 2014; Kim et al., 2017).

80% of hydrocarbon producing countries struggle with governance (Revenue Watch Institute, 2013). Newly producing O&G countries are most at risk of poor resource management, resulting in unstable regulations that extenuate pressure on relationships between government, industry and the domestic population (Acuña, 2015; Stevens, Kooroshy, Lahn, & Lee, 2013). As such, the strength and quality of national institutions is important (Heller, 2006; Rosser, 2006). Producer friendly institutions which follow the law and promote state growth, act accountably, bureaucratically and avoid corrupt behaviour are most likely to have effective local content mechanisms (Mehlum et al., 2006; Robinson, Torvik, & Verdier, 2006; Sachs, 2007)

For nascent producing countries, there are challenges in legislating local content due to uncertainty about the amount of resource which is available, the lack of experience in O&G and minimal governance capacity (Marcel et al., 2016). Additionally it is important to avoid the seven pitfalls described by Marcel et al. (2016) included in Table 4.

Table 4: Seven pitfalls to local content policies, (source: Marcel et al., 2016, p. 4)

Number	Local content pitfalls
1	A lack of long-term strategy focused on wider economic diversification and industrialisation.
2	A lack of understanding of the resource potential and country's capacity.
3	A lack of awareness of the oil industry's strategies and procurement methods, leading to policies misaligned with industry.
4	Poor monitoring, measuring and reporting mechanisms leading to poor enforcement of regulations.
5	Corruption, rentier behaviour is promoted, and local elites feel the benefits rather than expanding taxation.
6	Misalignment of local suppliers and education institutions to industry needs.
7	Poorly defined terms and terminology.

Successful implementation of local content policies is therefore largely linked to institutional strength, governance and rigour of the policies. Policies should be

adaptive and driven by long term national economic development (Marcel et al., 2016). It is widely agreed that MNCs must link their strategies with these policies to lead to lasting positive socio-economic impact (Ayentimi et al., 2016; Hansen et al., 2014; Hennisz, Dorobantu, & Nartey, 2014; Ngoasong, 2014).

Local content policies have however been criticised. For example local content policies are often excellent in theory, however if local people and businesses do not have the capacity or capability to meet industry needs, this can prevent local content policies from being effective (Andrews & Playfoot, 2015). Additionally, local content policies have been critiqued for not complying with the World Trade Organisation's international trade regulations which incorporate constrictions to incentivising nationalism of skills and services (Hestermeyer & Nielsen, 2014; Hufbauer, Schott, Cimino-Isaacs, Vieiro, & Wada, 2013; Warner, 2011). Additionally, as Tordo et al. (2013) describe, other issues include the potential misallocation of resources to non-competitive sectors, the potential to exacerbate market failures and lack of coherence with broader institutional frameworks. Regulations that are too stringent can "exacerbate supply bottlenecks", which can prevent other sectors from advancing, create inefficient economies and can lead to corruption.

2.3.4 Oil and gas companies and local content

Ngoasong (2014) found that O&G companies primarily source goods, services and supplies in order to comply with local content rules. The findings showed that recording local content activities, such as the hiring locally and prioritising local contractors is very challenging for O&G companies. Reporting and accountability mechanisms, ad-hoc requests for evidence of localisation and transparency all make local content compliance more difficult.

O&G companies often express narratives of successfully building capacity, training local people, developing supply chains, procuring locally and investing in communities. However, it is questionable how truthful and effective these activities are (Adewuyi & Ademola Oyejide, 2012; Warner, 2011). For example, Hennisz et al., (2014) believed that O&G companies only meet local content quotas to legitimise their position with the host government and local

stakeholders. Weldegiorgis, Ali, & Sturman (2017, p. 31) suggested that “too often local employment and procurement policies have been simply a good will gesture”.

O&G companies tend to work in isolation due to their competitive nature. This means different organisations frequently attempt to solve the same problems without addressing systemic local content issues. However, evidence suggests that when O&G companies work together as a cluster, this leads to greater knowledge sharing, a reduction in costs, advances in local competitiveness and capability in line with the needs of industry (CCSI, 2016; Morris, Kaplinsky, & Kaplan, 2012; Sigam & Garcia, 2012).

The effective application of local content regulations by O&G companies can lead to several long term benefits including local job creation (Heum, 2008; Ihua, 2010). However, building the capability of local people and local companies requires significant effort from O&G companies through direct investment and on-going support (Arthur & Arthur, 2014).

2.3.5 Local content in Ghana

In 2007, following the discovery of offshore commercial quantities of O&G in Ghana, production started in 2010. Initially the GoG prioritised a ‘revenue-focused approach’ aimed at maximising royalties and taxes without considering how long-term value could be added to the economy (Ovadia, 2016, p. 24). However, this soon changed when the Petroleum Commission was formed in 2011. This was set up to regulate the country’s O&G sector, under the ‘Petroleum Commission Act, 2011 (Act-821)’. The Petroleum Commission is responsible for expatriate work permits for O&G companies and the monitoring of local content activities. Local content in Ghana was not a new concept, with the ‘Minerals and Mining Law, 2006 (Act-703)’ and the ‘Minerals and Mining (General) Regulations, 2012 (L.I.-2173)’ which had introduced a local content framework for Ghana’s longstanding mining sector.

Firm local content legislations for Ghana’s O&G sector were brought into effect in November 2013, under the ‘Petroleum (Local Content and Local

Participation) Regulations, 2013 (L.I.-2204)'. L.I.-2204 sought to "promote the maximisation of value-addition and job creation" (Petroleum Commission, 2013). Eni (2016c, p. 9) describes L.I.-2204 as "the regulation is intended to assist with the sustainable development of the O&G industry in Ghana and help to avoid social and political instabilities, by promoting and requiring involvement of Ghanaian citizens, goods and services".

The overall target of the L.I.-2204 is to achieve 90% local participation across the Ghanaian O&G value chain within ten years of operations (Arthur & Arthur, 2014).

2.3.6 Reaction to local content in Ghana

Numerous academics have deliberated over the success of local content implementation within Ghana's O&G sector (Ablo, 2015; Amorin & Broni-Bediako, 2013; Arthur & Arthur, 2014; Asafu-Adjaye, 2010; Darkwah, 2013; Graham, Ackah, & Gyampo, 2016; Gyampo, 2011; Obeng-Odoom, 2014).

Ovadia (2016) found that there were early achievements with reports from Ghanaian officials that 70%-90% of employees within the O&G industry were Ghanaian nationals. Notwithstanding, Panford (2014b) stated how Ghana has a large and growing unemployment issue, and that the employment of Ghanaian nationals within the O&G sector can only have limited multiplier effects.

Amoako-Tuffour et al. (2015, p. 12) explained that Ghana is "not likely to be able to take advantage of the opportunities in the short to medium term", despite approaching local content policies in a "dedicated way, with the view to maximise the direct and indirect opportunities". They attributed this to a lack of capacity within the Petroleum Commission to monitor local content progress. Senoo & Armah (2015, p. 54) found that due to the lack of technically capable people available and the ineffective public education system to provide employable people that it "will be almost impossible and impractical to achieve the levels of local content desired in the timeframes specified."

Ghanaians expected major benefits from the O&G sector including access to cheaper petroleum products, job opportunities and improved quality of life

(Obeng-Odoom, 2015; Senoo & Armah, 2015). Principally, Ghanaians “expected more jobs to be created in the oil industry in order to reduce the level of unemployment in the country” (Plänitz & Kuzu, 2015, p. 26). However there are relatively very few jobs available within Ghana’s O&G sector (Andrews, 2014; Osei-Tutu, 2012). There is therefore “resentment among those who do not have jobs and the few that do” (Waskow & Welch, 2005, p. 122).

All respondents to a 2012 survey in Ghana about the GoG’s performance felt that there was insufficient progress in “maximising the employment creation potential of the industry” (Amoako-Tuffour et al., 2015, p. 14). Plänitz & Kuzu (2015) observed miscommunications from organisations about job opportunities for local people, with the Ministry of Energy suggesting 10,000 jobs would be created and Ghana O&G Service Providers Association suggesting 100,000 jobs. As expectations were high, this caused major frustration amongst Ghanaians. The Ghanaian media communicated the national frustration, adding to the problem by also describing the differences in salaries between local people and expatriates. Several examples are included in Table 5.

Table 5: Examples of negative Ghanaian press coverage of the industry’s impact nationally (source: various)

Source	Issues raised
Graphic, 2013	Concerns within the country that O&G will lead to the ‘Dutch disease’, with limited oil revenues impacting the economy.
GhanaWeb, 2014b	Local Schlumberger O&G workers dispute disparities in pay and work conditions with expatriates.
GhanaWeb, 2014a	Disappointment about Ghanaian nationals having at 379.5% salary disparity compared with expatriates.
ModernGhana, 2015	Frustration from local MODEC workers who were made redundant as a result of striking against pay disparities.
Graphic, 2017	Questions what the oil benefits have been for citizens of Ghana.

2.3.7 Local content in Eni Ghana

Eni is one of the world's largest O&G Exploration and Production (E&P) companies, with headquarters in Italy and a heritage of a national oil company.

Eni follows the "Mattei model", a philosophy set out by Eni's founder Enrico Mattei in the 1950s, who stated to host governments that "it is your oil, not ours" (Younger & Giambona, 2011, p. 41). Eni has a concept called the "dual flag" approach, whereby Eni works in "co-operation with host countries in order to generate opportunities for economic and social development in an increasingly complex global context" (Eni, 2017b).

Eni has been operating OCTP block 4 in Ghana since 2016 (Eni, 2016b). OCTP is an integrated O&G project operated by Eni Ghana which commenced operations in 2017 using a Floating Production Storage and Offloading (FPSO) unit (Eni, 2017a). An estimated 132 million barrels of oil and 1,079 billion cubic feet of gas will be produced. This will add an expected \$7.9bn total investment into the Ghanaian economy over an operational phase of 17 years (Eni, 2017a). The shareholders in OCTP are Eni Ghana (44.44%), Vitol Upstream Ghana Limited (35.56%) and Ghana National Petroleum Company (GNPC) (20%).

ERM (2015, p. 4) explained that "the project will have positive impacts in terms of jobs and the economy through increased government revenue, employment opportunities and skills enhancement, local procurement and hospitality and tourism". There are two phases to the project, first is the 'oil development phase', the second is the non-associated gas development phase'. Overall "the project involves oil production of approximately 45,000 barrels/day for the international market and non-associated gas production of 180 MMSCF/day for around 17 years which will be sent to the Ghanaian national network" (Eni, 2016a, p. 4).

Eni have awarded contracts worth \$1.82bn to Ghanaian companies and employed 155 Ghanaian employees (Eni, 2017a). They have planned for \$2.2mn investment in training each year, in addition to scholarships and training

programmes already being delivered through Eni Corporate University (ECU) and various Italian Universities (Eni, 2017c).

Eni Ghana developed a Local Content Development Plan (LCDP), which aimed to “ensure the management and control of activities aimed at maximizing Ghanaian workforce, goods and services on the project and developing capacity among the employees and the local suppliers but also the local communities and supply chain” (Eni, 2016a, p. 4).

The LCDP seeks to “provide benefits to the local community by employing local staff and creating business opportunities with local enterprises for economic development” and “enhance skills of the local population through initiatives of training and capacity building” (Eni, 2016a, p. 5). This also includes training local businesses to meet standards of MNCs in terms of procurement requirements. It also aims to meet local regulatory requirements for local content, to support the ‘social license to operate’ and to enhance stakeholder engagement (Eni, 2016a).

Eni Ghana also has a Recruitment, Employment and Training Plan (RETP), which includes all plans associated with selecting, training and hiring workers (Eni, 2016b:4). The plan not only applies to Eni Ghana, but also requires contractors to follow Eni protocols in the procurement of labour, goods and services. The plan states “all contractors (national and international) will be required to provide details of their own national employment and training plans” (Eni, 2016d, p. 22).

The RETP highlights that Eni will meet or exceed all local content targets (Eni, 2016d). This is managed through a Local Content Program that “will specify actions/timeline to be undertaken to ensure the fulfilment of the Local Content Minimum Requirements (or Levels) in terms of percentage of employed personnel as specified by the Petroleum (Local Content & Local Participation) Regulations 2013” (Eni, 2016d, p. 17).

2.4 Job role localisation

2.4.1 Introducing job role localisation

JRL is the process of training and developing nationals with the appropriate qualifications, competencies and experience to enable O&G companies to replace expatriates with nationals. JRL is one aspect of an organisation's localisation strategy to ensure that they comply with local content legislations.

Existing HR literature regarding JRL has traditionally focused on the replacement of management staff (Al-Asfour & Khan, 2014; Al-Lamki, 1998; Fryxell et al., 2004; Harry, 2007; Selmer, 2004; Williams et al., 2011). In Ghana for example, Oppong (2015) considered the localisation of management within mining MNCs. In a Chinese context, Fayol-Song (2013) reported that JRL reduces costs, retains local talent, raises local competencies, replaces inappropriate expatriates and strengthens relationships with the government. Whilst in Papua New Guinea, Bhanugopan & Fish (2007) highlighted the obstacles faced by the private sector in preventing the localisation of job roles.

There is a dearth of studies regarding JRL in the O&G industry (Kalufya, Michael, & Chalu, 2015; Rees et al., 2007). In terms of Ghana, only Oppong (2015) and Oppong & Gold (2016) have focused on JRL within the gold mining sector. The majority of previous studies have focused on the Middle East (Al-Asfour & Khan, 2014; Forstenlechner, 2009; Swailes et al., 2012) and China (Fayol-Song, 2013; Lam & Yeung, 2010; Selmer, 2003).

Whilst there are similarities and lessons to be learnt, JRL issues in the United Arab Emirates (Rees et al., 2007), Saudi Arabia (Al-Dosary & Rahman, 2005; Sadi & Al-Buraey, 2009), China (Kühlmann & Hutchings, 2010) are different to those of Ghana. For example, in the Middle East, the commitment of local managers, political stability, and public sector salaries being greater than that of the private sector, all affect JRL (Forstenlechner, 2009; Mellahi & Al-Hinai, 2000). In China, personal 'Guanxi' networks, local manager retention issues and/or language barriers impact JRL (Björkman & Lu, 1999; Groenewald,

2008). These issues are irrelevant in the Ghanaian context, highlighting the need to understand the national context.

Despite differences, similarities also exist within the literature regarding the motivation behind JRL and the barriers to succeeding.

2.4.2 What constitutes 'local'?

The definition of 'local' is controversial. Although local usually refers to the national level (Mifsud-Bonnici, 2013), it is also used to refer to affected communities close to operations (Tordo et al., 2013). Terms such as 'local', 'regional', 'national' are often used interchangeably, for example in the United Arab Emirates localisation is referred to as Emiratisation, and historically Africanisation of African states (Rees et al., 2007). Nwapi (2015) reported that governments often do not have a clear definition of the word 'local'.

Often people living in proximity to the resource extraction area are not considered. This can lead to "outsiders" benefitting, creating conflict amongst local communities and impacting O&G companies' 'social license to operate' (Nwapi, 2015, p. 187). In the case of Ghana, Nwapi (2015, p.199) explained that "there is no requirement anywhere in the regulation for any consideration to be given to communities located in the proximity of the resources". When locally affected communities do not benefit, this can lead to 'resource curse' symptoms at the subnational level (Cust & Viale, 2016; Gilberthorpe & Papyrakis, 2015).

Hiring nationals from across a country can create trickle-down effects within different communities and provide "overall benefit to the economy" (Tordo et al., 2013, p. 14). Therefore, Eni Ghana has a policy where "preference will be given to people of the project area, if some profiles cannot be recruited in the project region, they will be recruited in other Ghana regions" (Eni, 2015, p. 15). Therefore, although preference is given to people living near to the project site, a Ghanaian national is also considered as 'local'.

2.4.3 Reasons for job role localisation

There are many benefits of JRL for O&G companies.

One reason suggested by many academics is that JRL reduces costs. It is argued that expatriate employment costs are far greater than those of local people due to higher salaries and additional compensation such as housing, private drivers, medical cover, travel, schooling for children and security (Bhanugopan & Fish, 2007; Dickmann, Parry, & Keshavjee, 2017; Evans, Björkman, & Pucik, 2011; Fryxell et al., 2004; Hickey, 2017; Lam & Yeung, 2010; Lasserre & Ching, 1997; Law, Wong, & Wang, 2004; Li & Wang, 2010; Playfoot et al., 2017; Playfoot, Andrews, & Augustus, 2014; Rees et al., 2007; Selmer, 2004; Wong & Law, 1999). Bhanugopan & Fish (2007) found that expatriates were paid 60-80% more than local people doing the same job. All the participants in Fayol-Song's (2013) study believed that JRL can lead to cost savings. There is however an absence of empirical evidence to support claims that JRL either reduces or increases costs (Kobrin, 1988). This may be attributed to the difficulty there frequently is in obtaining reliable empirical information or statistical data (Harry 2007).

Good relationships with stakeholders are critical for O&G companies. When the local workforce is included within extractive projects, obtaining the 'social license to operate' is easier (Carrington & Pereira, 2011; Law et al., 2009). Furthermore, in addition to being seen favourably by local communities, localisation improves relationships with national and local governments (Forstenlechner, Madi, Selim, & Rutledge, 2012; Hailey & Harry, 2008). It is argued that local employees understand the national culture and institutional context in a way that expatriates cannot (Law et al., 2004; Selmer, 2004). Localisation can lead to better integration of the international company into the local context due to an in depth local knowledge that local people have (Lasserre & Ching, 1997).

Local people have greater access to business networks and find it easier to build valuable personal relations locally (Selmer, 2004). Hailey (1996) and Lam & Yeung (2010) also explained that local management have better relationships with junior staff, increasing cooperation amongst lower ranked nationals, which in turn enhances the retention and loyalty of local staff at all levels (Fayol-Song,

2013; Lasserre & Ching, 1997). Furthermore, the morale of local staff is improved due to proven career pathways.

Expatriate challenges are an additional reason to localise. Expatriate failure is a major issue for MNCs. This can cause significant costs when an expatriate returns home sooner than expected (Hailey & Harry, 2008; Okpara & Kabongo, 2011). MNCs have the challenge of selecting appropriate candidates for expatriation who are culturally sensitive and embrace localisation, because poor selection can have costly long-term knock-on effects (Ehnert & Brewster, 2008; Fayol-Song, 2013). Furthermore, it is far more challenging for expatriates to truly understand and immerse themselves within the local context of the country (Andrews, Chompusri, & Baldwin, 2003; Playfoot et al., 2014). Fayol-Song (2013) also argued that expatriates are replaced every two to three years, so localisation is a solution to the frequent shift in expatriate management as local employees remain locally for much longer.

It has also been argued by Hailey & Harry (2008) and Playfoot et al. (2017) that localisation not only makes business sense, but that it is ethically the right thing to do. Furthermore localisation demonstrates a commitment to the country (Selmer, 2004). Additionally, JRL is a robust mechanism during politically tumultuous times whereby local people remain committed to maintaining operations when expatriates must return home, as was experience by Wintershall in Libya (Andrews & Playfoot, 2015). JRL therefore has a number of drivers that can give a competitive advantage to companies that successfully implement localisation strategies (Law et al., 2009).

2.4.4 Barriers to job role localisation

Whilst there are multiple arguments in favour of localising job roles, there are also many barriers.

The most commonly cited issue is the lack of local people within the labour market who have the required qualifications, training and experience required (Al-Waqfi & Forstenlechner, 2014; Briscoe, 2014; Hailey & Harry, 2008; Lam & Yeung, 2010; Li & Wang, 2010; Selmer, 2004). This is exacerbated within the

O&G sector due to requirements for highly skilled and highly experienced people within management positions (O'Donnell, 2000). Furthermore, the high costs of training and developing local people can be prohibitive (Bhanugopan & Fish, 2007; Worm, Selmer, & de Leon, 2001). Nor is it just an issue of technical skills and competencies, but also one of cultural norms which might not be compatible with industry needs (Al-Ali, 2008; Bhanugopan & Fish, 2007; Swailes et al., 2012). MNCs must consider intercultural sensitivities and the local context in order to compete globally (Björkman & Lu, 1999; M. G. Harvey, 1997).

An undersupply of top talent leads to competition for the same people amongst different companies from multiple sectors (Li & Wang, 2010; Selmer, 2004). The lack of available talent is due to the mismatch between the provision of skills by the public education system and the needs of industry (Al-Dosary & Rahman, 2005; Al-Waqfi & Forstenlechner, 2014; Swailes et al., 2012). Poor leadership and limited investment by governments into aligning education with industry requirements have been attributed to this mismatch (Bhanugopan & Fish, 2007).

It has been argued that companies have traditionally struggled to implement successful localisation strategies (Fryxell et al., 2004; Lam & Yeung, 2010). This can frequently be linked to inappropriate succession planning in which employees are promoted too early and/or into unsuitable positions, or the wrong people are chosen (Fayol-Song, 2013). This compounds biases within MNCs towards the employment of expatriates, leading to the exclusion of local people (Hailey & Harry, 2008; Oppong & Gold, 2016).

Toumasi (1990, as cited in Bhanugopan & Fish, 2007) suggested that government's legislative targets around succession planning timelines can put pressure on companies to hire and promote too early. It has been argued that ambiguous and ineffective localisation policy design can negatively affect JRL (Al-Waqfi & Forstenlechner, 2014). Hailey (1996) claimed that pressure to localise the wrong people can come not only from government, but also from local management and the parent company.

Inappropriate selection, training and planning of the expatriate workforce is one of the most commonly agreed barriers to localisation (Law et al., 2009). Potter (1989) noted that the attitudes of expatriates can be an issue, which Selmer (2004) described as an unwillingness to embrace localisation. It is common place that expatriates believe they take on extra work on top of their existing workload to train and develop local staff who then go on to replace them, which causes tension amongst expatriates (Hailey & Harry, 2008; Oppong, 2015). However, it is not just the attitude of expatriates that act as a barrier. The attitudes of local people can impede localisation, for example, an underestimation by local people of the skills and requirements needed for particular job roles (Potter, 1989; Swailes et al., 2012).

Trust issues are frequently reported as a barrier. Expatriate management can have concerns about control being handed to local managers (Lam & Yeung, 2010). O&G companies have a culture of employing expatriates as they often don't trust local staff and can perceive the productivity and attitudes of local people as a barrier (Randeree, 2009). Companies seek to avoid risks of local people being opportunistic and acting in self-interest (Selmer, 2004). Hailey (1996) also described issues of trust of expatriates by the local workforce too.

Conflict can occur between expatriates and local people. Notably, differences in salaries and compensation can cause tension and resentment (Hailey, 1996; Li & Wang, 2010; Swailes et al., 2012). Bhanugopan & Fish (2007) explained that local people can perceive expatriates as arrogant, aggravated by communication barriers, cultural misunderstanding and differing business standards.

However, it is also argued that expatriates are indispensable to business success overseas. Local people can lack awareness of company culture and parent company strategies, whereas expatriates often come with head office experience. This means that expatriates understand the corporate culture and strategy and act as bridge between the local setting and the head office (Kobrin, 1988; Lam & Yeung, 2010; Selmer, 2004). Furthermore, expatriates are

required for their knowledge and experience transfer and ease of control by head office (Lam & Yeung, 2010; Selmer, 2004).

Communication and commitment issues affect successful localisation; subsidiaries and parent company have different levels of commitment to localisation (Law et al., 2009; Swailes et al., 2012). Subsidiaries often maintain Western practices, following the parent company culture and protocols without adapting to the local context (Evans et al., 2011; Gomes, Sahadev, Glaister, & Demirbag, 2015; Horwitz, 2009; Pudelko & Harzing, 2007). Western HR practices can prevent the advancement of local people into management roles (Oppong & Gold, 2016).

2.4.5 The unique case of oil and gas

Although vast in capital expenditure, direct employment within the O&G industry is minimal (Ablo, 2017; Karl, 2004; Ovadia, 2012). Kim et al. (2017) highlighted how an offshore O&G project produces fewer jobs than an onshore O&G project, largely due to minimal space on-board FPSOs or offshore rigs. There are significant opportunities for greater impact through indirect and induced employment (Wise & Shtylla, 2007).

In addition to the limited number of direct jobs created, O&G projects are highly dependent on contractor organisations (Konschnik & Boling, 2014). In some cases, only 10% of the workforce are employed by the O&G operating company (Stammler & Ivanova, 2016). Contractors, according to Ngoasong (2014), often are not embedded within the host nations or incentivised to add-value locally, meaning local investment may be negligible.

As such, there are different definitions for types of workers within O&G projects. Eni defines 'direct workers' as "workers directly engaged by Eni with a clear employment relationship and complete control over the working conditions and treatment" (Eni, 2016d, p. 10). 'Contracted workers' are defined as "workers engaged through third parties ... to perform work related to core business processes of the project for a substantial duration" (Eni, 2016d, p. 10). Indirect

employees are ‘supply chain workers’, known as “workers engaged by the Eni suppliers providing goods and materials” (Eni, 2016d, p. 10).

Employment levels fluctuate throughout different phases of the O&G project lifecycle (Werner et al., 2016; Wilson & Kuszewski, 2011). There are limited numbers available during exploration, peak numbers during the construction phase, relatively few during operations and gradually decreasing in the decommissioning phase (CCSI, 2016; Tordo et al., 2013), as shown in Figure 1.

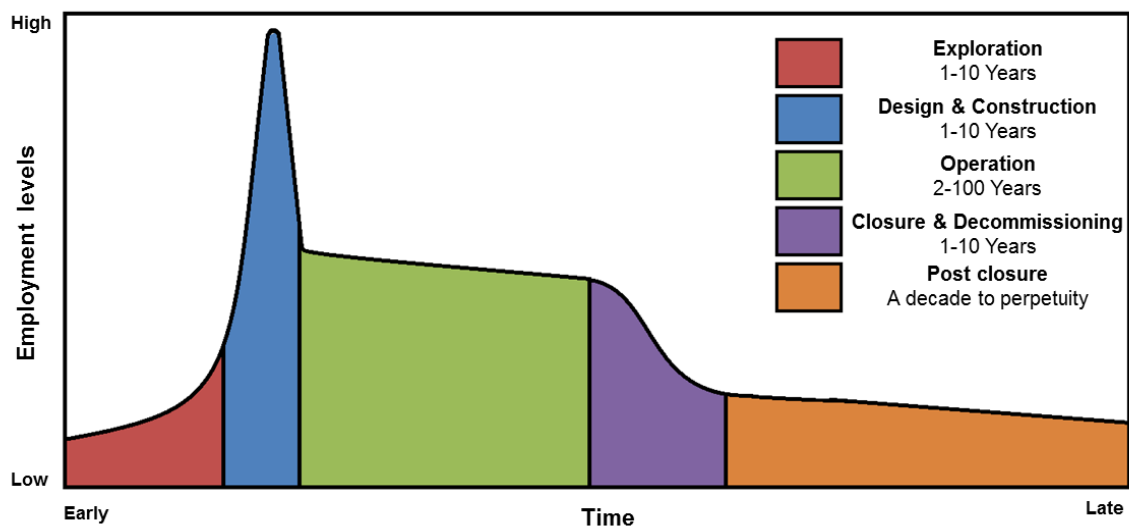


Figure 1: Employment opportunities in the lifecycle of a project (source: modified from International Council on Mining & Minerals, 2016, p. 32)

O&G companies must forecast their manpower plans to fit with the fluctuations in employment requirements. Workforce planning ensures the company has “the right number of people, with the right skills, in the right place and at the right time” (Sullivan, 2005, p. 233). This, Sullivan (2005) believed, can lead to cost reductions and is a strategy for dealing with tumultuous economic times. Table 6 shows the challenges and enablers of workforce planning.

Table 6: Challenges and enablers of workforce planning (source: CIPD, 2010, p. 23)

Challenges	Enablers
Lack of focus in organisation strategy	Collaboration about requirements between the business, HR and finance
Constantly shifting strategy	Workforce champions in the business
Too much focus on the operational and budgetary planning at expense of longer-term planning	Good processes to feed information about the business needs
Processes don't join up during the planning cycle	HR and the line working to understand future needs
Plans are not responsive to changing environments	Understanding the supply and demand for labour
Poor quality data	Bottom-up communication feeding into planning
Too much focus on the numbers of people required and not on capacity to build future skills	Good quality data, with adequate analysis and leadership support analysis
Overcomplicated and trying to achieve too much too soon	Regular planning cycle and reviews to feedback into plans
Lack of planning skills	Developing managers' workforce planning skills

2.4.6 Industry standards as a barrier

The O&G industry requires very high standards (Werner et al., 2016). This can act as a barrier to localisation if the standards are not available locally (Arthur & Arthur, 2014). This leads to MNCs preferring expatriates who meet the exacting requirements (Bhanugopan & Fish, 2007).

Nordås et al. (2003) showed that for emerging producing countries there is frequently an immature local workforce. This exacerbates the challenge of companies finding local people who meet the industry standards. This can apply even to longstanding producing countries such as Angola (Teka, 2011).

The events of the Deepwater Horizon disaster in 2010, Exxon Valdez in 1989, Piper Alpha in 1988 and Texas City Refinery in 2005 all highlighted the need for safety compliance, standards and competency assurance within the industry (Playfoot et al., 2014; Wilson & Kuszewski, 2011). As a result of these events, O&G companies enforced stringent international standards to maintain competitiveness, profitability and operational safety. This has resulted in companies relying upon an international workforce and supply network (Ismail, 2010; Warner, 2011).

Being competent requires the right combination of skills, knowledge, and experience, and “the ability to undertake responsibilities, and to perform activities to a recognised standard” (Unger & Hopkins, 2017, p. 2). O&G companies require a combination of technical and behavioural competencies which define the appropriate demonstrable capabilities for a job role (Flin, 1995).

Due to their risk-averse nature, O&G companies often require extensive experience, qualifications and training, which act as a barrier to local people who lack these. Potter (1989) questions whether companies set qualification and experience requirements too high, precluding localisation from succeeding.

Government investment in national education systems as a result of O&G revenues can advance local human capital (Davis, 1995; Stijns, 2006). However, contrary to their findings, several studies reported that hydrocarbon resource wealth can have negative impacts on public education expenditure (Araji & Mohtadi, 2014; Behbudi, Mamipour, & Karami, 2010; Birdsall, Pinckney, & Sabot, 2000; Gylfason, 2001; Philippot, 2010). In the case of Ghana, Obeng-Odoom (2015) explained that oil wealth has not negatively impacted investment in public education, with increased demand and supply of education services as a result of O&G activities.

Causes of skills shortages in Sub-Saharan Africa include the lack of educational capacity, poor technical vocational education and training (TVET) capacity, lack of accreditation and an extensive demand by industry for highly skilled workers (Morris et al., 2012). To address local skills shortages, Sigam & Garcia (2012)

suggested that the government and O&G companies must be directly involved in building local education capacity or else companies are forced to hire high proportions of expatriates.

The mismatch between education provision and industry needs is a major barrier (Sigam & Garcia, 2012) and particularly, if there is a lack of field training or on-the-job training opportunities within education (Bhanugopan & Fish, 2007). With such stringent requirements from O&G companies that prioritise safety, localising job roles can be additionally challenging.

2.4.7 Job role localisation legislations in Ghana

Operating companies are required to develop succession and training plans for Ghanaians to replace expatriates. Companies “need to submit a detailed annual recruitment and training program for Ghanaians” (Eni, 2016d, p. 10).

The Ministry of Energy produced the “Local Content and Local Participation in Petroleum Activities – Policy Framework” in February 2010 (Ministry of Energy, 2010). Within this framework O&G companies are expected to achieve an overall 90% localisation within 10 years of operation (Petroleum Commission, 2016). Within the L.I.-2204 legislation there are several relevant articles as shown in Table 7. Arthur & Arthur (2014) found that O&G companies are concerned about achieving the 90% targets required of them.

There are few existing studies focused on Ghana’s O&G sector requirement for a skilled local workforce (Darkwah, 2013; Obeng-Odoom, 2015; Panford, 2014a). By training, developing and employing Ghanaians, this has the potential to reduce costs, which in turn incentivises O&G companies to hire more local people (Arthur & Arthur, 2014).

Table 7: Principal L.I.-2204 articles focused on employing Ghanaians (source: Petroleum Commission, 2013)

Article	L.I.-2204 article details
Articles 1-c, 10 and 18	<p>The requirements for minimum recruitment of Ghanaian staff.</p> <p>This includes “management staff” beginning with 30%, then 50%-60% at five years and 70%-80% at 10 years.</p> <p>Whilst for “technical core staff” companies must commence at 20%, then 50%-60% at five years and 70%-80% at 10 years.</p> <p>For “other staff” companies must start at 30%, then 50%-60% at five years and 70%-80% at 10 years.</p>
Article 17	<p>O&G companies and contractors must submit an “Employment and Training Sub-Plan” which forecasts all employment and training expectations and a timeline for which job roles will be provided to Ghanaian workers.</p> <p>This is reported every three months, including any new Ghanaian job roles. If Ghanaians are not hired then Ghanaians are due to receive “every reasonable effort” of training.</p>
Article 18	<p>Requires operators and contractors to provide a succession plan for all expatriate job roles to meet the time frames required by the Petroleum Commission.</p> <p>Additionally, Ghanaians are required to understudy expatriates to accelerate the replacement of expatriates by Ghanaians.</p>

2.4.8 Is the Ghanaian labour market ready?

Ghana has an estimated population of 27 million people (CIA, 2017). Agbola (2013, p. 2860) found that foreign direct investment is able to “stimulate economic growth in Ghana and with the impact further enhanced by improving the human capital skill base of the country”. However, Ghana has an absence of local people with the skills and experience needed by the O&G industry due to “Ghana’s lack of focus in training that is relevant to the specifics of the [O&G] industry” according to Amoako-Tuffour et al. (2015, p. 19).

Within Ghana, there are a large number of education and training institutions that offer courses in O&G related subjects (Obeng-Odoom, 2015; Panford, 2014a). However, “the educational level of the available workforce is not sufficient enough to take positions on the oil rigs or other side industries. As a result, high skilled workers that are needed at the oil facilities are brought in either from Accra or directly from abroad” (Plänitz & Kuzu, 2015, p. 57). This is due to “the failure of the educational system to equip enough locals for the O&G industry” (Senoo & Armah, 2015, p. 45). Therefore the GoG and O&G companies must provide local people with the experience and training required for O&G jobs to enable local people to be employable, according to Arthur & Arthur (2014).

Ghanaian migration has been prevalent since the 1990s. Ghana has a 46% emigration rate for highly skilled people, the highest rate in West Africa (Quartey, 2009). As such, there is an opportunity to attract the international Ghanaian diaspora or to inpatriate Ghanaians to fill O&G skills gaps (Harvey, 1997).

Ghanaians with the specific skill sets required by the operating companies are therefore a commodity in themselves, and there is a ‘war for talent’ and high competition for top skilled Ghanaians (Oppong & Gold, 2016).

2.5 Measuring, monitoring and planning local content and localisation

Traditionally O&G companies have struggled with the measurement, monitoring and planning of local content and localisation (Tordo et al., 2013). Understanding, evaluating and explaining the results from metrics is challenging because local content issues are often intangible, hard to quantify and difficult to balance regulatory and business needs (Harvey, 2014; Ovadia, 2014; Warner, 2011).

Several valuable studies have investigated the impact of the O&G sector on job creation (Considine, Watson, & Blumsack, 2010; Swift, Moore, & Sanchez, 2011). Agerton, Hartley, Medlock, & Temzelides (2017) studied an array of economic impact assessments, noting that Input-Output methods (such as those used by Kim et al., 2017) can lead to higher expectations of employment and called for a new model. Weldegiorgis et al. (2017) have recently completed a systematic overview and analysis of 25 different instruments, tools and mechanisms for organisations and governments to measure impact of hydrocarbon projects.

Within the wider sphere, there have been numerous studies, reports and documents outlining frameworks, models, tools and decision trees, recommending how to maximise local content strategies to increase shared value creation (Esteves, 2008; Hamann, 2003; OECD, 2016). There were limitations with many of these guidelines, for example too theoretical (Playfoot et al., 2017) or a lack of involvement from governments (IPIECA, 2016).

Decision analysis is used widely within the O&G industry, for example for O&G investments (Smith & McCardle, 1999) for prioritising exploration activities (Dyer, Lund, Larsen, Kumar, & Leone, 1990) and for evaluating decommissioning strategies (Henrion, Bernstein, & Swamy, 2015). Esteves (2008) used decision analysis for evaluating community investments by extractive companies and Marcel et al. (2016) used a decision tree methodology to provide local content guidance to emerging O&G producers.

This study has drawn upon the strengths of many of these existing recommendations, decision analyses and tools. For example, the IFC FV tool has strengths in measuring intangible costs and benefits (IFC, 2014; Macmillan & Sproat, 2016). DAI's LCOM model (DAI, 2016) provided evidence that early investment in local capabilities can reduce costs and In-Kingdom Total Value Add (IKTVA) has a backcasting methodology which uses milestones to work back from (Saudi Aramco, 2017).

However no decision analysis methodologies have been used within any JRL studies. Given the challenges faced by companies in successfully measuring, monitoring and planning and the gap in the literature, there is a need for an empirical investigation into whether decision frameworks can lead to structured, practical and sound decisions that support companies local content and localisation strategies.

3 Aim, hypotheses and objectives

3.1 Aim

To investigate whether localising job roles within the O&G industry is viable and can reduce costs.

3.2 Hypotheses and objectives

Hypothesis one:

- Opinions about local content and JRL issues differ between O&G companies, education institutions, training and consulting companies and governments.

This is addressed by the following objective:

- To identify similarities and differences of opinions, experiences and recommendations amongst different stakeholders associated with JRL within the global O&G industry.

Hypothesis two:

- There are national context specific factors which impact JRL.

This is addressed by the following objective:

- To identify factors which affect JRL, using Ghana as an example of a country that is in the process of localising its O&G industry.

Hypothesis three:

- It is possible to analyse the viability of localising particular job roles using a decision making methodology.

This is addressed by the following objective:

- Working with one company in Ghana (Eni Ghana) to investigate the viability of localising O&G job roles by applying a decision tree methodology to a sample of ten different roles.

Hypothesis four:

- Early investment in the training and development of local people enables O&G companies to reduce staffing costs by localising expatriate job roles.

This is addressed by the following objective:

- To assess whether the costs of employing expatriates outweigh the costs of localisation by applying training and development investment timelines to a sample of five expatriate job roles.

3.3 Summary

The aim, hypotheses and objectives are summarised in Figure 2.

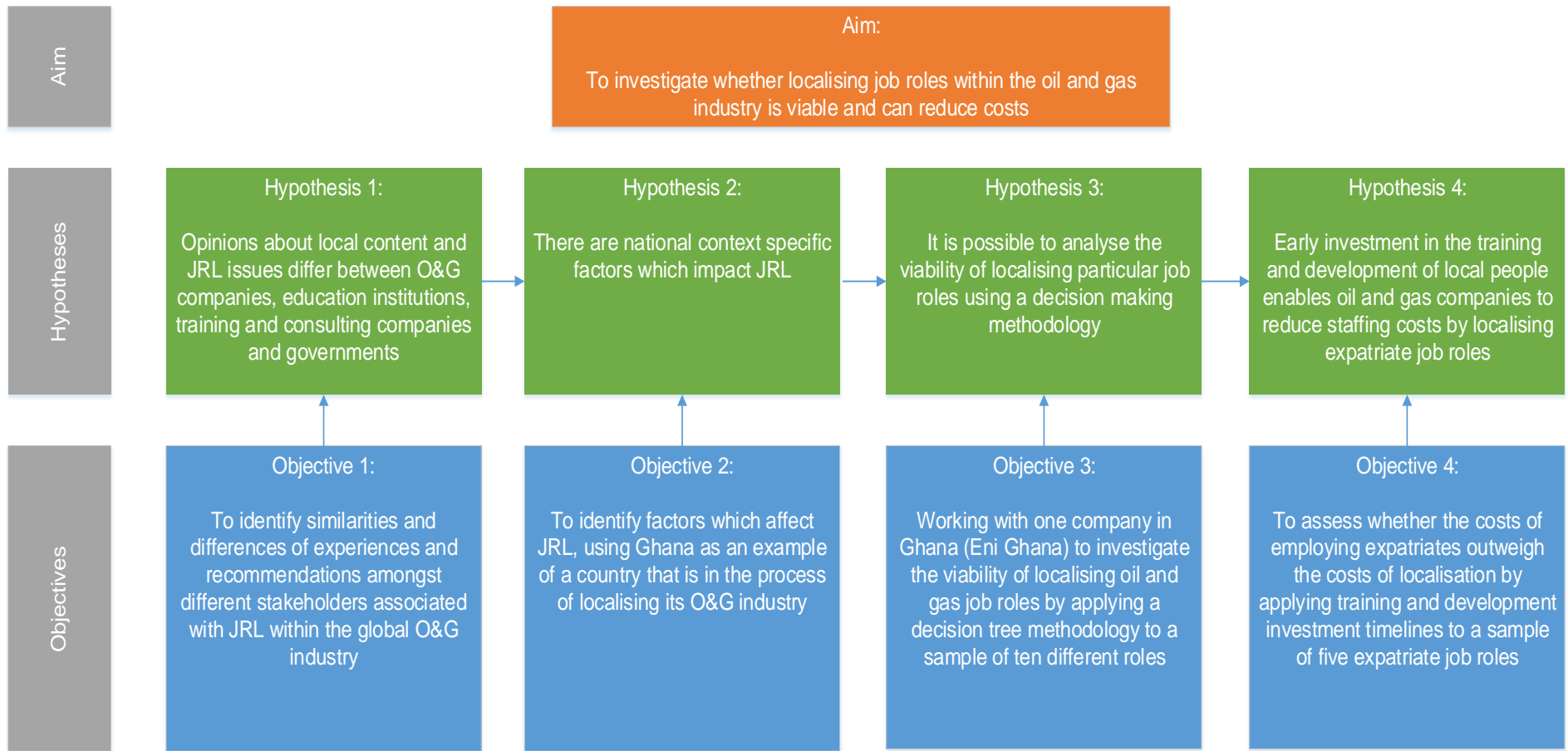


Figure 2: Aim, hypotheses and corresponding objectives

4 Methodology

4.1 Scientific approach and research design

4.1.1 Overview

This study aimed to investigate whether localising job roles within the O&G industry is viable and can reduce costs. A hypothetico-deductive approach comprising four sequential hypotheses with four accompanying objectives was used to address the research aim.

The hypotheses form a funnel from the global level, refined to a country context; and then a company specific case study, as in Figure 3.

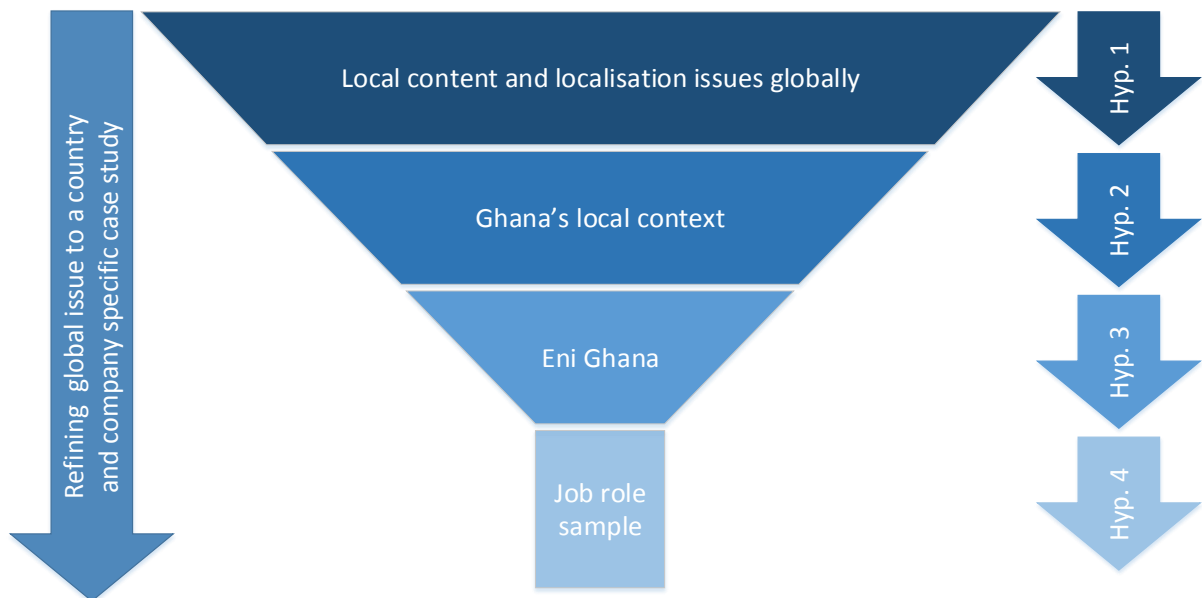


Figure 3: Funnel process of the four hypotheses

The chapter describes the theoretical framework used and the rationale behind the mixed methods approach adopted in this study. An overview of each method of data collection is articulated, explaining the theoretical background and reasoning behind the selected methods. This is followed by a description of the data analysis methods for each hypothesis.

4.1.2 Theoretical framework - realism

This research took a realist ontology, which seeks explanation of real world issues (Kitchin & Tate, 2013). Realism was appropriate due to its pragmatic, practical and explanatory nature, through research that explains the causal mechanisms and structures that underpin practice within a societal, business and political framework.

Realism is compatible with the methodological characteristics of both qualitative and quantitative research and can facilitate cooperation between the two (Greene, 2006; Mark, Henry, & Julnes, 2000). Maxwell & Mittapalli (2010) provided an extensive critical overview of the realist ontology in practical application within mixed methods research. They explained that taking “realist perspectives and approaches can make important contributions to mixed method research” (Maxwell & Mittapalli, 2010, p. 167).

Perry (1998) argued that realism is the most appropriate paradigm for case study research, stating that realist assumptions of an external reality enable the collection of both observable and unobservable perceptions. Whereas other theoretical frameworks such as positivist positions require only observable phenomena to be researched. Realism seeks to discover structures and mechanisms by combining theoretical reasoning with experimentation (Outhwaite, 1983). As such, a realist paradigm is appropriate within case study research when the aim is to investigate and describe variables associated with complex real life problems (Yin, 2013).

In the context of this study, a realist stance used a mixed methods approach to explain global and national local content issues and test whether JRL could theoretically reduce costs using a case study in Ghana.

4.1.3 Research design - mixed methods

An explanatory sequential design was used in this study utilising a mixed methods approach for data collection and analysis (Creswell, 2015).

A mixed methods approach was used because it draws upon the strengths and mitigates the weaknesses of pure qualitative or quantitative research methodologies (Teddlie & Tashakkori, 2010). As Creswell & Plano Clark (2007, p. 7) explained “the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone”.

By creating a highly structured research plan, the sequential approach to data collection, analysis and later connection of results led to more in depth knowledge creation than either qualitative or quantitative approaches in isolation. Integrating methods led to the triangulation of findings to corroborate each other and support recommendations. This has provided credibility to the research, enabling generalisations to be made, adding to the external validity of the research (Bryman, 2006).

Furthermore the use of mixed methods approaches in case study research is beneficial, due to the robust nature of the detailed empirical data collected using a variety of techniques (Kitchenham, 2010). Case studies have the advantage of allowing in depth investigation into complex real-life issues, enabling the user to build and apply testable theories (Stake, 1995; Yin, 2013). Nevertheless, case studies have been critiqued for lacking scientific rigour due to limitations such as researcher subjectivity bias, reliability, and difficulty in forming generalisations (Verschuren, 2003). In contrast, Flyvbjerg (2006) has argued that in depth case studies are effective for generating and testing hypotheses, results can be generalised and that verification bias is no more likely to occur than for any other research method.

Explanatory sequential design methodology uses quantitative data as the foundation of the research, with qualitative data to provide an in-depth explanation of the quantitative results. The methodology for this research was similar to Creswell & Plano Clark's (2007, p. 73) sequence, as shown in Figure 4.

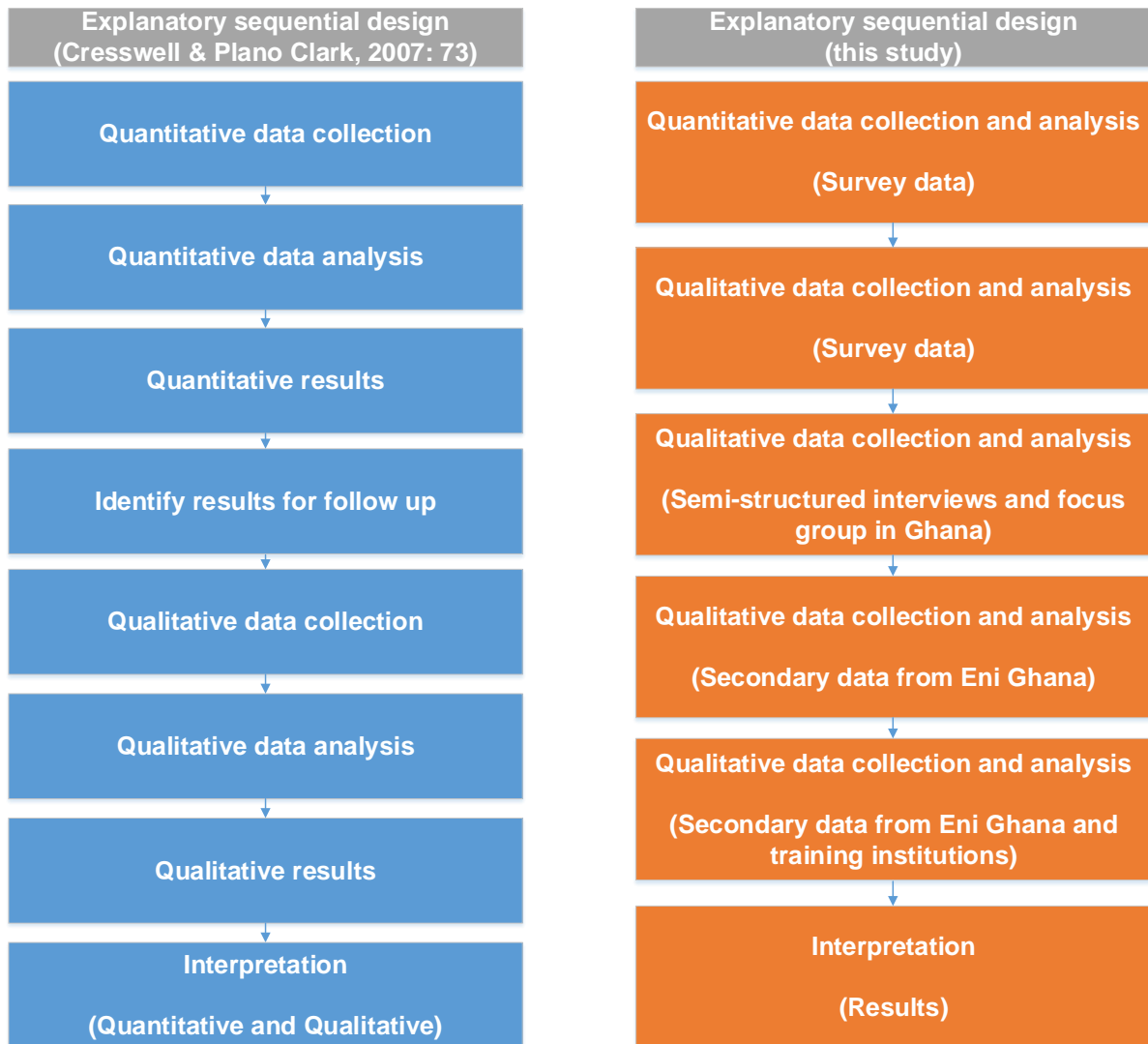


Figure 4: Explanatory sequential design process and sequential design for this study (sources: Creswell and Plano Clark, 2007, p. 73 and original)

Mixed methods sit well within the realist ontology as it is necessary to gain substantial amounts of primary and secondary data in order to seek explanation of real life issues (Manzano, 2016). Given the complexity of the research aim, mixed methods were best suited to this study. This research used quantitative questionnaire data, qualitative questionnaire data, semi-structured interviews and group interview data, secondary job role data and secondary training data in order to test the hypotheses, as shown in Figure 5.

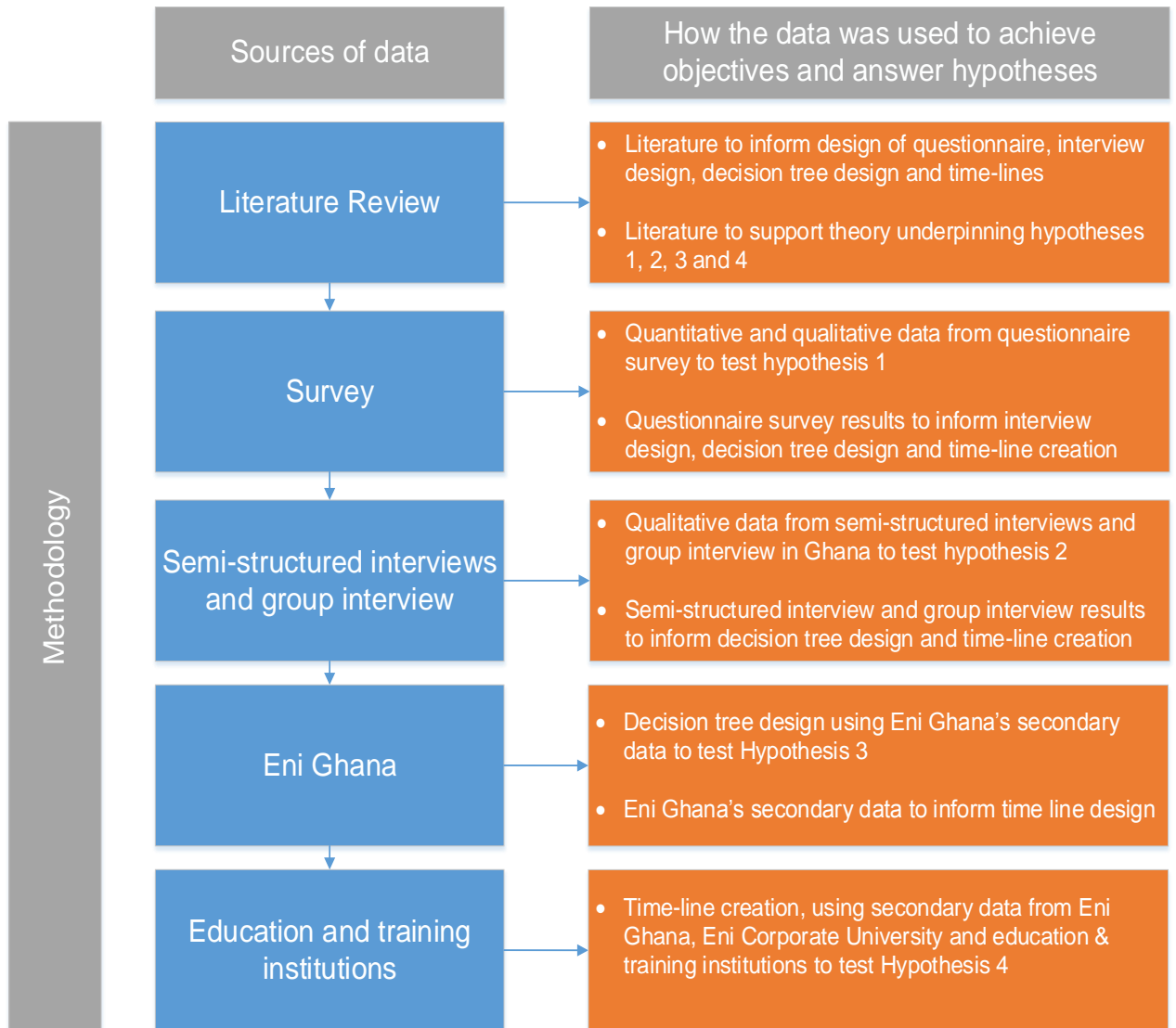


Figure 5: Sources of data to test hypotheses

4.1.4 Ethics

Ethical approval was granted through Cranfield University Research Ethics System prior to proceeding with the research, and the 'Framework for Research Ethics' set by the Economic and Social Research Council was abided by.

Consideration of the welfare, protection and rights of all participants was paramount for those involved in primary research. For all participants who responded to the questionnaire a detailed explanation of the purpose of the research was provided. No demographic information was taken and all

participants were assured of anonymity and confidentiality, including the organisation they represented, as shown in Appendix A.2.

Informed written consent was gained from all participants involved in the interviews, and all interviewees were informed that all responses would be anonymised, as shown in Appendix B.2. Deceptive practices were avoided and all participants were given the right to withdraw their contributions. Permission was sought for secondary data relating to any organisation involved, with specific checks regarding confidentiality agreements and non-disclosure requirements.

4.2 Methods - hypothesis one

Hypothesis one analysed perspectives of practitioners worldwide about common local content and localisation issues.

4.2.1 Theoretical background

Questionnaires are used to survey a representation of a sub-set of a population in order to define generalisations of the overall sample (Valentine, 2005). The majority of existing JRL empirical studies use a Likert scale questionnaire surveys (Al-Lamki, 2005; Forstenlechner et al., 2012; Fryxell et al., 2004; Lam & Yeung, 2010; Law et al., 2009; Sadi & Al-Buraey, 2009; Selmer, 2003; Williams et al., 2011). Likert type questions, used in this study, are valuable for measuring attitudes and opinions providing a range of possible responses (Likert, 1932).

A questionnaire was designed to gather information from a global context, through eliciting perspectives from different stakeholders world-wide. The self-administered semi-structured questionnaire consisted of three parts, as found in Appendix A.1.

In Part 1, the type of organisation respondents worked for was identified. Detailed demographic details were not requested as they were not necessary for testing the hypothesis. The first two closed questions required multiple choice responses from participants.

Part 2 consisted of 20 Likert type questions using a five point scale which sought answers to each question on a scale of Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree. The independent variables were the responses to the 20 questions. The questions were based on the literature review, in particular papers outlined in Table 8.

Table 8: Literature that influenced the questionnaire design

Question	Topic	Associated literature
2a	What constitutes local?	IPIECA (2011:8), Tordo et al. (2013:1)
3a	Responsibility for local workforce	Playfoot et al. (2017:66), OECD (2016:12)
1b	Job role localisation	IPIECA (2011:53); Tordo et al. (2013; 26)
2b	Expatriate pay difference	Playfoot et al. (2017:xi), Kim et al. (2017)
3b	Mind-set shift about local content	IPIECA (2011); Marcel et al. (2016)
4	Local supply chain investment	IPIECA (2011:8); OECD (2016:12-13)
5	Enterprise development centres	OECD (2016:14), IPIECA (2011:25)
6	Multi-sector skills	Kim et al. (2017:11); Arthur & Arthur (2014:68)
7	Government agency alignment	OECD (2016:10), Marcel et al. (2016).
8	Percentage metrics	Tordo et al. (2013:48); Marcel et al. (2016:4)
9	O&G driver for economic growth	OECD (2016:9); Tordo et al. (2013:xi)
10	National distribution of benefits	IPIECA (2011:25); OECD (2016:11)
11	National vs. international training	OECD (2016:14); Playfoot et al. (2017:78)
12	Education alignment with industry	OECD (2016:12-13); Tordo et al. (2013:137)
13	Impact on local communities	IPIECA (2011:52); Tordo et al. (2013:15)
14	Should operations run local content initiatives	Marcel et al. (2016:21); Playfoot et al. (2017:36)
15	Employment expectations	IPIECA (2011:52); Tordo et al. (2013:148)
16	Investment in local people skills	IPIECA (2011:35); OECD (2016:12-13);
17	O&G companies working together	OECD (2016:23), Playfoot et al. (2017:67)
18	Communication of opportunities	Marcel et al. (2016:14); OECD (2016:13)
19	Regional collaboration for skills	Tordo et al. (2013:xvi), OECD (2016:18)
20	Incentives by governments	OECD (2016:14), Tordo et al. (2013:23)

Part 3 included three open-ended qualitative questions which sought opinions, examples and experiences associated to JRL successes, barriers and recommendations.

A pilot of the questionnaire was tested amongst five peers to assess its strengths and weaknesses. Minor modifications were made to the questionnaire.

4.2.2 Participants and data collection

All study participants attended the Getenergy Global 2017 conference in London which focused on localisation within the O&G industry. The event had 420 attendees from 48 countries, of whom 330 senior representatives were appropriate to survey. Using a non-probability, purposive sampling method, 330 individuals known for their local content knowledge and experience were approached to complete the questionnaire. Respondents were all provided with a written description of the research aim (Appendix B.1). Respondents could choose to return the questionnaire by post, email or in person. No incentive was provided to encourage participants to respond.

43 paper questionnaires were distributed in person at the Getenergy Global 2017 conference and 287 were sent electronically by email. In total 330 were distributed. 210 responses were received, resulting in a 64% response rate. This high response rate was in part due to several follow up emails or phone calls.

The sample was categorised into six groupings according to the employing organisation of the participant; "Government or National Oil Company (NOC)", "International Oil Company (IOC) or Service Company", "Training/Consulting Organisation", "Public University", "NGO/Aid organisation" and "Association". Type of organisation was the dependent variable.

4.2.3 Questionnaire analysis

Quantitative analysis

The Likert data were inputted into Microsoft Excel and exported to IBM SPSS Statistics v.24. The quantitative data was analysed to present descriptive statistics and inferential statistics for selected questions.

Likert type questions provide ordinal data because it cannot be presumed that the intervals between each of the five-point values are equal (Jamieson, 2004). It is not possible, for example to assume that the difference between 'neutral' and 'agree' has the same as the difference between 'agree' and 'strongly agree'.

For descriptive statistics, frequencies, cross-tabulations and contingency tables are all suitable for Likert type data (Allen & Seaman, 2007). The median or mode are appropriate measures of central tendency (Boone & Boone, 2012). It is not viable to use the mean, as the distribution of values in Likert items is not equal.

In this study frequencies, medians and interquartile range were calculated for all questions. Similarities in responses were observed through the mode responses of each organisation type and the mode response for the entire sample for each question.

As Likert type responses generate ordinal data, the appropriate statistical tests are distribution free, non-parametric tests such as Kendall tau B or C, Pearson's Chi square, or Kruskal-Wallis statistical tests (Sullivan & Artino, 2013).

The Kruskal-Wallis test was used to analyse variance in participants' responses between the different categories of organisations. Kruskal-Wallis tests are appropriate when there are three or more groups and data does not meet the requirements for a parametric test, in which case a one-way ANOVA would be more powerful.

The Kruskal-Wallis (H) equation is:

$$H = \frac{12}{N(N-1)} \sum_{i=1}^k \frac{R_i^2}{n_i} - 3(N+1)$$

Equation 1: Kruskal-Wallis (H) equation (source: Field, 2009, p. 660)

To measure the consistency of the questionnaire, a Cronbach's alpha coefficient was calculated to report internal consistency. This explains how closely related the sets of questions are to each other, in other words the extent to which items in an instrument are "consistent among themselves and with the overall instrument" (Croasmun & Ostrom, 2011, p. 20). A Cronbach's $\alpha = .7$ or above is considered reliable. Cronbach's alpha equation is:

$$\alpha = \frac{N^2 \overline{\text{Cov}}}{\sum s_{\text{item}}^2 + \sum \text{Cov}_{\text{item}}}$$

Equation 2: Cronbach's alpha equation (source: Field, 2009, p. 674)

Despite the pilot, question 20 had erroneous wording which nullified the responses, so question 20 is not included in the results).

Qualitative analysis

The responses to the three open ended qualitative questions were entered into QSR International Nvivo software. The responses were categorised into two groups consisting of successful and unsuccessful issues that impact local content and localisation. Patterns of responses were collated to review which issues were the most commonly referred to and pertinent. The results were formulated into a list of issues and quotations, which were used to help explain the questionnaire's quantitative results.

4.3 Methods - hypothesis two

Hypothesis two assessed the opinions of Ghanaian representatives associated with O&G to understand the specific context of Ghana.

4.3.1 Theoretical background

In order to test hypothesis two, semi-structured interviews were undertaken, a methodology used in several previous JRL studies (Fayol-Song, 2013; Law et al., 2009; Rees et al., 2007; Swailes et al., 2012).

Using interviews enables the researcher or interviewee to raise unexpected issues, which provides a more flexible, rich and in-depth inquiry than questionnaires (Silverman, 2014). Interviews “take a conversational, fluid form, each interview according to the interests, experiences and views of the interviewees” (Valentine, 2005, p. 111). Due to the more fluid nature of semi-structured interviews, they can be used to supplement survey responses to gain more rich data (Valentine, 2005). Interviews provide open ended, unique and detailed responses, which made them appropriate for detailing factors specific to the context of Ghana.

Within realism, gleaning as much detail as possible from interviews is important, although there is no agreed number of interviews required to meet saturation (Saumure & Given, 2008). Although (Pawson, 2013) explained that the relevance, quality and rigour of interviews are more important than the quantity of interviews undertaken.

Pawson & Tilley (1997) explained that purposive selection processes enable the researcher to understand the different contexts, mechanisms and outcomes. As such this approach was used for selecting the sample from Ghana.

Relevant to this research, Valentine (2005) described that when interviewing business people, they will seek the upper hand, often refuse recording of interviews and demand a vetting of transcripts. Whilst working in the developing world, it is important to build trust whilst taking into consideration power

relations and cultural differences and consider local codes of practice (Robson & Willis, 1994).

4.3.2 Participants and data collection

Participants

A purposive sampling method was used to develop a list of potential interviewees during a six day visit by the researcher to Accra and Takoradi in Ghana. All the interviewees who were invited to participate were practitioners, experts or students with an interest in Ghana's O&G sector.

The practitioner and expert group was drawn from industry event speakers, LinkedIn searches or referrals from third parties. The final sample of 21 interviewees were employed by different categories of organisation including 'Government or NOC' (N = 5), 'IOC or Service Company' (N = 9), 'Training/Consulting Organisation' (N = 4) and 'Public Universities' (N = 3). A further nine people were approached, of whom three did not respond and six were unavailable.

A group interview of ten Ghanaian students from Takoradi Technical University (TTU) who had recently completed an O&G training programme was pre-arranged by a third party in consultation with the researcher (Thomas, 2017).

The breakdown of the 31 interviewees is shown in Figure 6. Of the 31 people who agreed to participate, 26 (84%) were unknown to the researcher. None of the interviewees had completed the previous questionnaire described in hypothesis one.

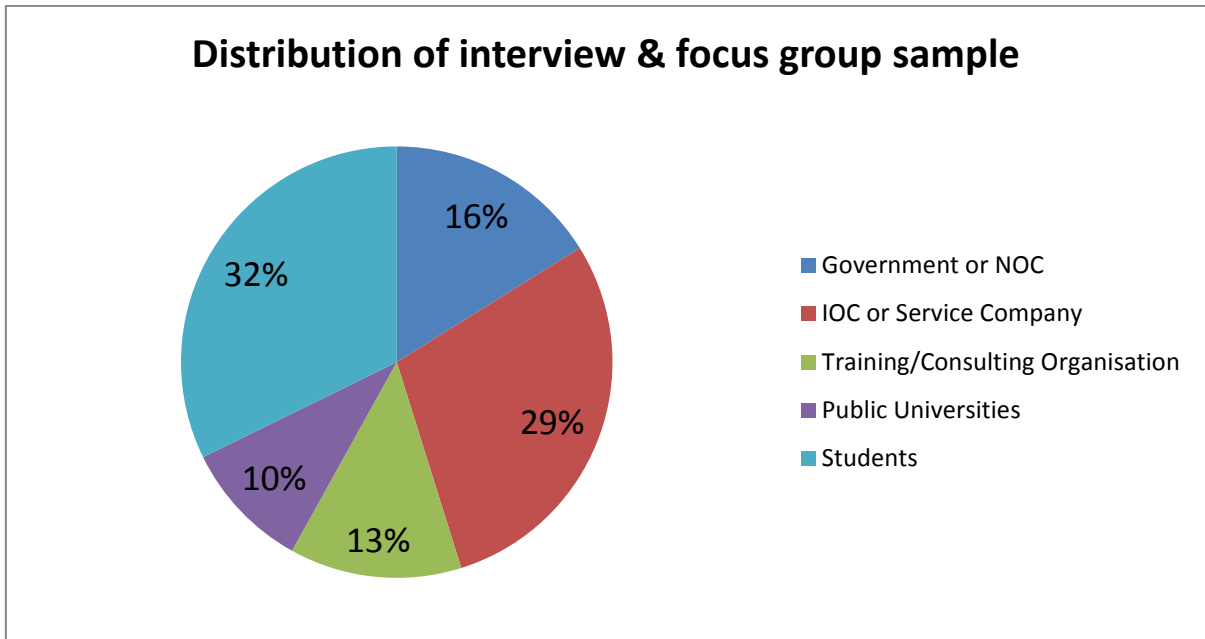


Figure 6: Distribution of interview & group interview sample

Each semi-structured interview and group interview participant was provided with details about the research (Appendices B.2 and B.3) and was required to sign a consent form (Appendix B.4). One participant would only agree to be interviewed in a personal capacity, rather than on behalf of their organisation, despite promised anonymity. Each respondent was offered the opportunity to review a copy of the interview write-up. One interviewee made minor amendments.

Data Collection

All semi-structured interviews (N = 21) were arranged by the researcher through LinkedIn, email or phone call. They were conducted by the researcher face-to-face in offices or hotels in Ghana and ranged between 45 and 60 minutes. The group interview, which was led by the researcher, lasted for two hours and took place in the university setting.

The researcher used an interview guide, see Appendix B.1 (Patton, 1990). The interview guide used exploratory pre-planned themes and probing questions, with variations in the questions depending on the respondent's organisation type. This conforms to realist ontology (Manzano, 2016). Hand-written notes

were taken by the researcher during the interviews. The researcher was cognisant at all times of issues of power relations, the requirement for different levels of formality and of the local social, political and economic context for each interviewee (Valentine, 2005). This approach allowed rapport to be built and for flexibility within the conversations.

In total, 22 datasets were gathered: 21 semi-structured interviews and the group interview.

4.3.3 Thematic analysis of qualitative data

This study has followed Miles, Huberman, & Saldana's (2013) suggestion of three concurrent flows of activities for qualitative data analysis: data condensation, data display and conclusion drawing/verification. Condensing the data required “selecting, focusing, simplifying, abstracting and/or transforming the data” (Miles et al., 2013, p. 12).

The data collected from the 21 interviews and group interview were combined into one Microsoft Word document as the source dataset. This was imported into QSR International Nvivo software. Each statement was categorised by organisation type.

The software was then used to visually code the text into different categories (Babbie, 2009). The software was used for ‘thematic analysis’ to identify valuable statements, themes and patterns within the dataset (Denzin & Lincoln, 2011). To achieve this, a coding framework of common nodes was developed.

An open coding method led to a list of approximately 200 nodes. The source dataset was interrogated line by line. After a complete review of the dataset, a second round of synthesis took place. Axial coding, which is the process of identifying connections between nodes, led to sub-categories and the merging of similar nodes. Following this, selective coding then led to the development of overarching categories. The coding method (which used terminology from grounded theory) led to four overarching categories, 14 themes and 80 Ghana specific factors. This synthesis approach proved to be an effective way of identifying key statements, patterns and themes.

The second activity, outlined by Miles et al., (2013, p. 12), was to consider the best way to display the condensed data, in order to provide an “organized, compressed assembly of information that allows conclusion drawing”. The key statements, patterns and themes about Ghana’s local context was displayed in two ways: a matrix and extended text.

The third activity was the drawing and verification of conclusions (Miles et al., 2013). The holistic dataset was used to interpret patterns and explanations about relevant legislation, culture, expectations, behaviours and opinions that impact local content and localisation in Ghana. These were incorporated within the matrix and extended text. The matrix was used as a framework to draw conclusions, and extended text provided detail and context.

These findings were used to inform the testing of hypothesis three.

4.4 Methods - hypothesis three

Hypothesis three used a case study of one company operating in Ghana, Eni Ghana to investigate the viability of localising a sample of ten job roles.

4.4.1 Theoretical background

A decision tree methodology was employed to address hypothesis three, which sought to investigate the viability of localising job roles. Within the field of decision analysis there are multiple methods that enable the decision maker to make better informed choices. Decision trees are one method, which were deemed appropriate for this study. Decision trees can either be classification models, which apply to categorical data or regression models, which apply to numerical or continuous data. Classification trees have a limited number of possible decisions in no specific order and were used in this study.

Decision trees have a number of advantages. Complex decisions can be deconstructed into a series of smaller decisions, allowing reasoning behind each decision (Newendorp & Schuyler, 2000). Models are quick to build and the analysis is consistent. They are flexible and can allow re-analysis if circumstances change. They are a simple way of analysing non-numerical information, which can be used for “information extraction and pattern recognition” (Park, Falcone, & Teodoriu, 2009, p. 76). However, there are challenges for complex decision trees in defining their order and organisation.

Decision trees are a sequence of possible choices and potential outcomes that take the form of “a flow-chart-like tree structure, where each node denotes a test on an attribute value, each branch represents an outcome of the test, and tree leaves represent classes or class distributions” (Han, Kamber, & Pei, 2012, p. 18). Decision trees are a series of branches and nodes. Branches stem out from the node. There are different representations of nodes. A circular symbol represents a chance node, where the outcome is uncertain; a square symbol represents a decision node, where the user makes one choice between options (Kirkwood, 2002). The triangular node represents the terminal node and is the

final decision. Only one terminal node can be chosen and branches never re-join.

A decision tree is analysed by working backwards from the terminal node. A chance node requires a logical calculation, and a decision node requires a hypothetical decision to be made. A 'decision strategy' refers to the final sequence of decision leads (Kirkwood, 2002, p. 14). The size of the decision tree is reduced by 'pruning' unused branches to show the overall decision strategy.

4.4.2 Decision tree design

A logic based classification decision tree was chosen to analyse the viability of localising a sample of ten job roles in Ghana's O&G sector, in order to test hypothesis three. A sequence of ten processes was required to design and test this study's decision tree, seen in Table 9. The data collection phases through to the decision tree design phases are shown as processes one to six within Table 9.

Table 9: Decision tree sequence of processes

Order	Process	Phase
1	Review literature and legislations, questionnaire results, interview and group interview results and Eni framework for job roles.	Data collection
2	Access a sample of job roles by seeking secondary job role data for ten different job roles from Eni Ghana.	Data collection
3	Clean and process the secondary data, to ensure all the data is in the same format and prepared for application through the decision tree.	Data preparation
4	Partition the data to prepare for training and validation, one job role was used for training purposes and nine for validation.	Data preparation
5	Define the classifications to be included within the decision tree and propose an order to those classifications.	Decision tree design
6	Structure the classification tree to include all appropriate nodes and options, chances and decisions at each classification point.	Decision tree design
7	Train the decision tree using data from one job role. Use this to pilot the decision tree with a representative of Eni to advise on weaknesses.	Decision tree training
8	Validate the tree using the secondary data for the ten roles	Decision tree validation
9	Run the decision trees with Eni Ghana's HR team to analyse the decision tree. Map the decision tree for each job role providing conclusions about JRL viability.	Decision tree testing
10	Prune the decision tree where branches are not taken.	Decision tree pruning

The sample of ten job roles was selected by Eni Ghana's HR Manager made up of what are currently five expatriate job roles and five local job roles held by Ghanaian nationals. The ten direct job roles were chosen from different levels within the organisation. The five expatriate jobs were deemed as challenging roles to localise. Appendix C.1 lists the ten job roles (Tables C.1 and C.2). All 10 jobs roles are required throughout the 17 year operations phase of the OCTP. One additional local role was provided for decision tree training purposes.

The data was delivered in multiple different formats, so in step 1 it was cleaned, processed and prepared in a standardised format within Microsoft Excel. The data was then partitioned into two, “the training data set and the validation data set” (Osei-Bryson, 2004, p. 1935).

Eni Ghana’s job specifications, survey results, interview results, Ghanaian legislations and the literature review were used to identify the appropriate classifications for the decision tree. Initially these were posed as a simple influence diagram, which were then distributed into alternatives, conditions and outcomes. The 22 classifications and possible outcomes were put into an order as shown in Table 10. Palisade PrecisionTree software was used to design the decision tree.

Table 10: Classification list for decision tree with node type

Order	Classification	Node type
1	Job role	Decision
2	Position contract type	Decision
3	Number of positions at any one point	Decision
4	L.I.-2204 - functional role level	Decision
5	When is the position required?	Chance
6	% of positions are taken within expatriate quota	Chance
7	How much would this role affect political risk?	Decision
8	Preference for expat or local	Decision
9	Job role experience required	Decision
10	Offshore or specialism experience required	Decision
11	Experience with Eni	Decision
12	Education requirement	Decision
13	Main responsibilities requirements	Decision
14	Management requirements	Decision
15	Internal interface requirements	Decision
16	External interface requirements	Decision
17	HSE compliance requirements	Decision
18	Required knowledge, technical or professional skills	Decision
19	Personal capabilities requirements	Decision
20	Languages requirements	Decision
21	Training and courses requirements	Decision
22	Professional qualifications requirements	Decision

4.4.3 Decision tree analysis

The decision tree training, testing and pruning phases are outlined in Table 9 as processes seven to ten.

The additional job role provided by Eni Ghana was used to train the decision tree during the growth phase of the decision tree. The decision tree was then piloted with a representative of Eni, who recommended one additional classification. Once the decision tree had been trained and piloted, the secondary data from each of the ten roles were used to populate and validate the decision tree.

The penultimate phase was to test the decision tree using PrecisionTree software with a representative from Eni Ghana's HR department. The researcher and the representative together mapped the decision tree for each job role, based on the experience and knowledge of the HR representative. A decision pathway was developed for each job role based on a 2017 scenario, when operations commenced in Eni Ghana's OCTP project. Then the five expatriate roles were tested based on a hypothetical 2027 scenario, when Eni Ghana will be required to achieve 90% localisation by the GoG. As the local roles have already been localised they are not tested for 2027.

The branches that were not taken within decision tree strategies were pruned using PrecisionTree software, to clearly represent each decision strategy. Once complete, a simple flow chart was designed using Microsoft Visio 2016 software for each role.

These results were used to analyse the viability of localising each of the job roles.

4.5 Methods - hypothesis four

Hypothesis four used a sample of five expatriate job roles to investigate whether costs can be reduced by localising the job roles.

4.5.1 Theoretical background

Hypothesis four was tested using training and development investment timelines to quantify whether staffing costs could be reduced by localising expatriate job roles.

There was a choice of two approaches for the training and development investment timelines. The first was to assume the need to commence from university education through to employment for each role. This required the backcasting of the costs and length of time it would take for a Ghanaian to being ready to undertake that particular role.

The second approach was to review the career ladder for each expatriate job role, and establish the closest job role occupied by a Ghanaian. With this information it would be possible to identify the competencies, skills and knowledge required to bridge the gap between the current job holder and that of the expatriate roles.

Due to challenges in accessing to data for the second option, the first option was chosen. This research used road-map building principals, including milestones, actions and financial investments.

A Gantt chart methodology was adopted for the training and development investment timelines. A Gantt chart is “a matrix that lists on the vertical axis all the tasks or activities to be performed in a process” (Aguilar-Savén, 2004, p. 136). Gantt charts are commonly used in project management to incorporate activities within a time scale. Whilst they are very clear planning tools, they have been criticised for listing activities without providing explanation, they use a one-step approach to actions and they encourage over-control by the user (Maylor, 2001). Gantt charts were not found in any empirical studies on localisation. However, Ashina & Fujino (2013) presented a Gantt chart as a timeline for

backcasting. Saudi Aramco (2017) used backcasting as an approach for IKTVA investment planning, the principals of which have relevance for this study. Backcasting is the process of “generating a desirable future, and then looking backwards from that future to the present in order to strategize and to plan how it could be achieved” (Vergragt & Quist, 2011, p. 747).

NPV calculations were used in this study to quantify the value of training and development investments over the OCTP project’s operational phase. Net present value (NPV) is the difference between the current value of money over time. NPV is commonly used in business scenarios to estimate profitability of investments over time.

4.5.2 Training and development investment timeline design

The training and development investment timelines for each job role took the form of Gantt charts to display the required investments.

The timelines were designed to provide two very important outcomes. The first was a temporal assessment of how long the training and development would take. This would provide insight into whether the localisation of the sample of job roles could be achieved during OCTP’s 17 year operational phase. The second was a financial assessment to calculate whether the estimated cost of training, developing and employing a local person for each job role was less than employing an expatriate throughout the operational phase.

The same five expatriate job roles that were selected by Eni Ghana for the decision trees were used as the sample. This sample represented senior management staff required throughout the operations phase of the OCTP project in Ghana. Using the same sample maintained consistency.

Backcast timelines require the “creation of a target vision of what is to be realized” (Ashina & Fujino, 2013, p. 100). In this case the target was for each job role to be localised by 2027, which is the deadline for Eni Ghana to achieve 90% localisation. Therefore, JRL viability was the independent variable, and the

dependent variables were the characteristics of each job role, such as education, experience and training required.

These requirements were collated for each job role. Judgment was used as the basis of sequence of activities. For example it would be necessary to have a university degree before having job role experience. A Gantt chart was constructed using Microsoft Excel software for each role. This was populated with each requirement from Eni Ghana's secondary job specification data as layers in the Gantt chart.

Education and training cost data was collected based on the requirements of each job role using websites and discussions with universities and training providers in Ghana and worldwide. These costs, together with costs such as estimated salaries, additional remunerations, travel, accommodation and annual buffers were included within the Excel spreadsheet.

4.5.3 Training and development investment timeline analysis

The time and cost data for each job role were analysed to quantify whether the costs of training and developing local people is less than employing an expatriate.

The target localisation year was 2027, ten years after the first oil production within the OCTP project, when Eni Ghana will be required to achieve 90% localisation by the GoG. It was then possible to backcast from 2027 all of the experience, education and training requirements. Therefore, working backwards from 2027 the years required for experience and education was calculated to the point in time when each training and development programme would need to commence. In each case, this would enable the Ghanaian person who had completed the training and development programme to be hired for seven years from 2027 until the completion of the OCTP project's operations phase. This backcasting process established the length of time required to localise each job role.

For each job role, the costs were calculated for all experience, education and training requirements. This included calculating the costs of university scholarship at an appropriate Ghanaian university, accommodation costs and additional costs. An estimation of salary and additional remuneration was included for all national and international experience requirements. This led to an estimation of all training course costs (including flights, accommodation and additional buffers) throughout the training and development phase. This included all courses necessary to ensure the individuals on the training and development programme would have the qualifications, competencies and experience required for employment in each role. Additionally, in each case, using Eni Ghana expatriate cost data, the cost of employing an expatriate was calculated for ten years up to the 2027 localisation date, as an expatriate would be required until the point at which a local person could replace them. An additional buffer of \$10,000 USD per annum was included to account for any additional unknown costs.

A comparison was then made of the cost of employing an expatriate for the duration of the operations phase with the cost of the training and development plan and consequent years of employment for a local person. NPVs were calculated using Ghanaian and Italian O&G sector Weighted Average Cost of Capital (WACC) figures. Expatriate remuneration is paid by Eni in Italy and so the 2018 Italian WACC was used in the NPV discount rate calculations (7.76%) (Damodaran, 2017b). For local people, remuneration is paid by Eni in Ghana, so the 2018 Ghanaian WACC was applied in NPV discount rate calculations (13.04%) (Damodaran, 2017a). In the calculations for the local person, it was necessary to combine two discount rates to account for the ten years of employing an expatriate.

Additionally, to test the differences in developing and training a local person with employing an expatriate based on absolute costs, the NPV was calculated using a 0% discount rate.

These figures were used to calculate whether the cost of training and developing local people is less than employing an expatriate for each job role. A

sum of the NPV calculations was included for all job roles in both scenarios to analyse whether the overall cost of localisation was less than employing expatriates.

5 Results

5.1 Results - hypothesis one

Hypothesis one sought to analyse whether different stakeholders have differences in opinions about local content and localisation issues. This was achieved through a global survey. 330 questionnaires were distributed and 210 people responded, representing a 64% return rate.

Of the 210 responses, only three respondents were from 'NGO/Aid organisations' and three from 'Associations', collectively representing 3% of the population. As this was not a fair representation of their organisations globally, all six were discarded from the analysis, leaving a total of 204 analysed questionnaires.

The results report descriptive and inferential statistics, and thematic analysis of the 3 open-ended questions.

5.1.1 Overall sample

The sample population (N = 204), was comprised of four organisation types. IOC or services company 34.80% (N = 71), training/consulting organisation 28.43% (N = 58), public university/academia 19.12% (N = 39) and government or NOC 17.65% (N = 36) shown in Figure 7. The greatest number of responses came from IOCs and service companies, with a similar number from public university/academia and government or NOCs.

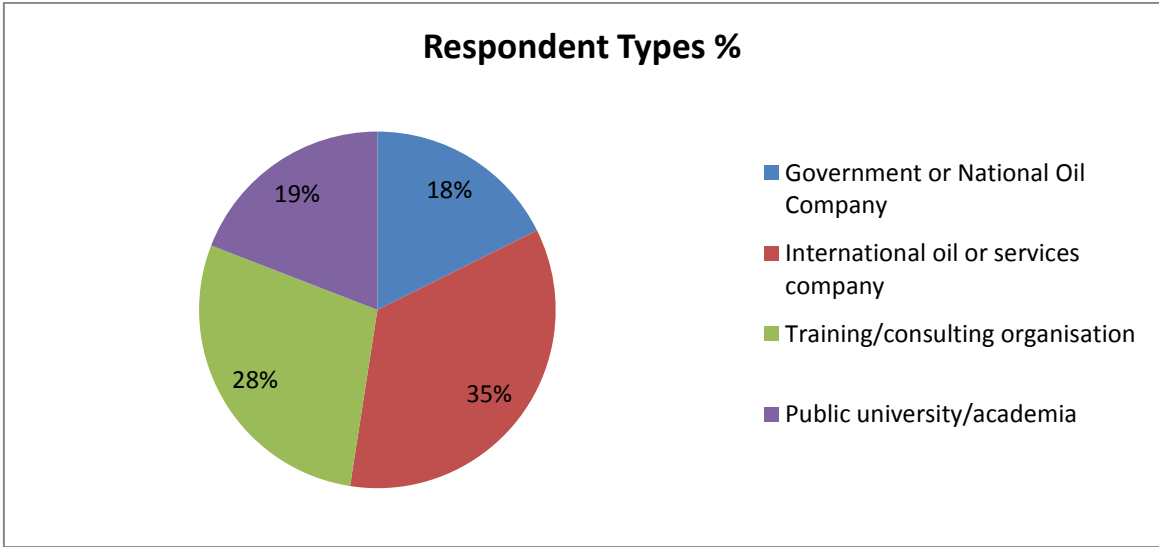


Figure 7: Respondent types % (NGO/Aid and Associations discarded)

72.55% (N = 148) of respondents defined ‘local’ as the national scale when referring to local content. Whilst 16.18% (N = 33) believe that ‘local’ refers to the community scale and 11.27% (N = 23) believed that it referred to both, as shown in Figure 8.

Within the qualitative responses one respondent explained that ‘local’ can “define the entire country whilst others use a combination of local and national to differentiate the local community from the rest of the country”. Another wrote that “tension and sometimes conflict is created by hiring national workers and failing to hire sufficient local workers to satisfy the local population living close to the project site”. As such, whilst the majority of respondents suggested the national scale, ‘local’ can refer to both national and community scales. The findings highlight that the majority of respondents considered that local content should focus on national benefit.

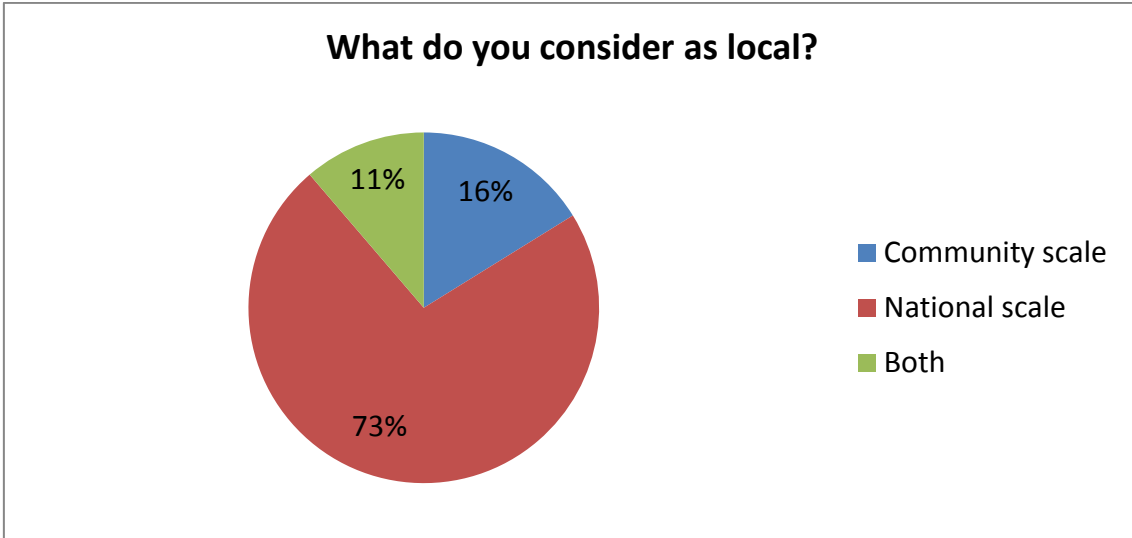


Figure 8: Percentage distributions of respondent definitions of 'local'

The majority of respondents (83.33% N = 170) believed developing a local workforce is the responsibility of both the government and O&G companies, as shown in Figure 9. 7.84% (N = 18) considered this to be the sole duty of the O&G companies and a similar percentage (8.82%, N = 16) thought this to be the role purely of the government. This highlights that the majority of respondents believe that developing the local workforce is considered a joint responsibility for both government and O&G companies.

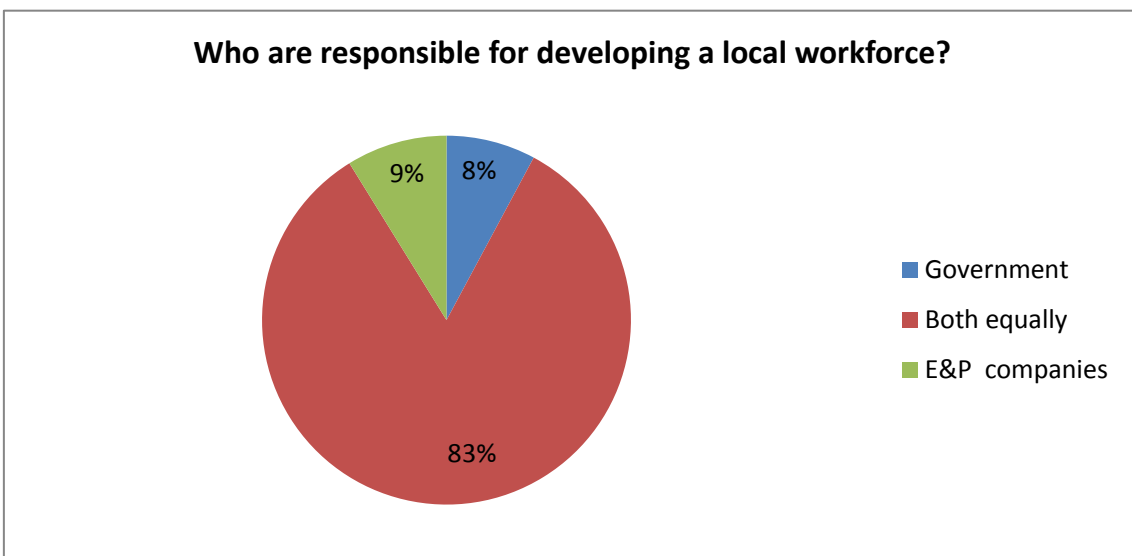


Figure 9: Percentage distributions of respondents' opinions of who is responsible for local workforce development

5.1.2 Differences

Kruskal-Wallis H tests were applied to all questions to assess whether there were statistically significant differences between the responses of respondents amongst the groups of organisation types. Of the 19 questions, there were only four statistically significant differences.

Difference one: all job roles should be localised rather than using expatriate labour

204 respondents answered this question. The median response was “Neutral”, whilst the most common occurring value was “Disagree”. The spread of results was dispersed (range = 4) and by removing the outliers the variability of results is quite low (interquartile range = 2).

Overall, 5.9% (N = 12) strongly disagreed, 27.5% (N = 56) agreed, 17.6% (N = 36) were neutral, 43.1% (N = 88) disagreed and 5.9% (N = 12) strongly disagreed.

There was a statistically significant difference between the four organisations' about whether all job roles should be localised rather than using expatriate labour, $H(3) = 10.67$, $p = .014$, as shown in Figure 10. A post-hoc test using Dunn's test with Bonferroni correction showed statistically significant differences occurred between training/consulting organisations and international oil or service companies, $p = .024$.

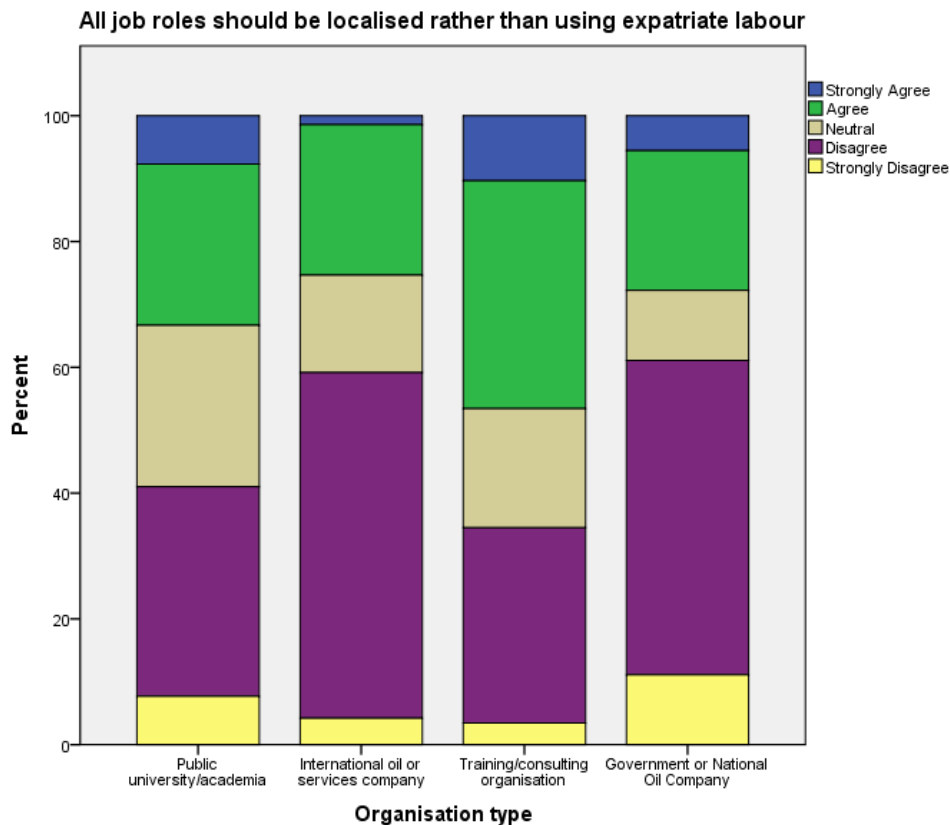


Figure 10: Responses by organisation type to “all job roles should be localised rather than using expatriate labour”

Difference two: National and local governments are completely aligned in their national development strategies

204 respondents answered this question. The median response was “Disagree” and the most common occurring value was “Disagree”. The spread of results was dispersed (range = 4) and by removing the outliers, the variability of results is low (interquartile range = 1).

Overall, 3.4% (N = 7) strongly agreed, 11.3% (N = 23) agreed, 26.0% (N = 53) were neutral, 50.0% (N = 102) disagreed and 9.3% (N = 19) strongly disagreed.

There was a statistically significant difference between the four organisations’ about whether national and local governments are completely aligned in their national development strategies, $H(3) = 7.83, p = .050$, as shown in Figure 11.

A post-hoc test using Dunn's test with Bonferroni correction showed no specific statistically significant differences between each organisation when compared with one another.

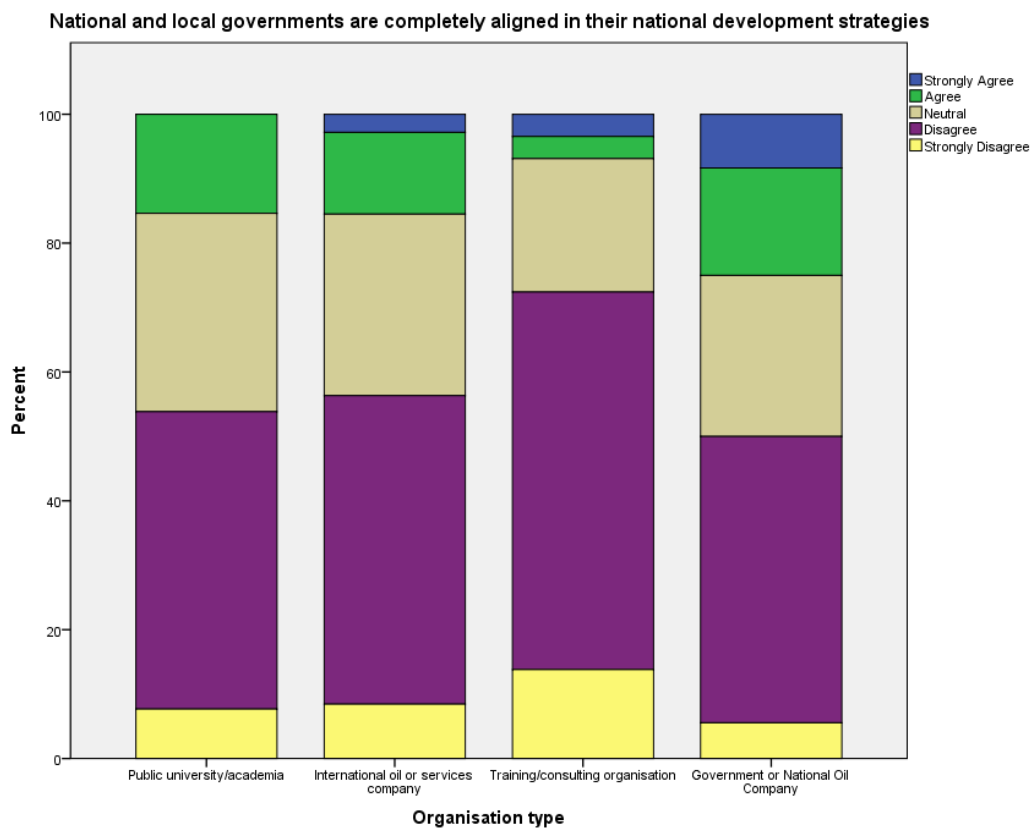


Figure 11: Responses by organisation type to “national and local governments are completely aligned in their national development strategies”

Difference three: socio-economic benefits from oil and gas projects are evenly distributed across the economy

204 respondents answered this question. The median response was “Disagree”, and the most common occurring value was “Disagree”. The spread of results was dispersed (range = 4) and by removing the outliers, the variability of results is low (interquartile range = 1).

Overall, 2.9% (N = 6) strongly agreed, 7.4% (N = 15) agreed, 17.2% (N = 35) were neutral, 54.9% (N = 112) disagreed and 17.6% (N = 36) strongly disagreed.

There was a statistically significant difference between the four organisations' about whether the socio-economic benefits from O&G projects are evenly distributed across the economy, $H(3) = 10.85$, $p = .013$, as shown in Figure 12. A post-hoc test using Dunn's test with Bonferroni correction showed statistically significant differences between training/consulting organisations and international oil or service companies, $p = .017$.

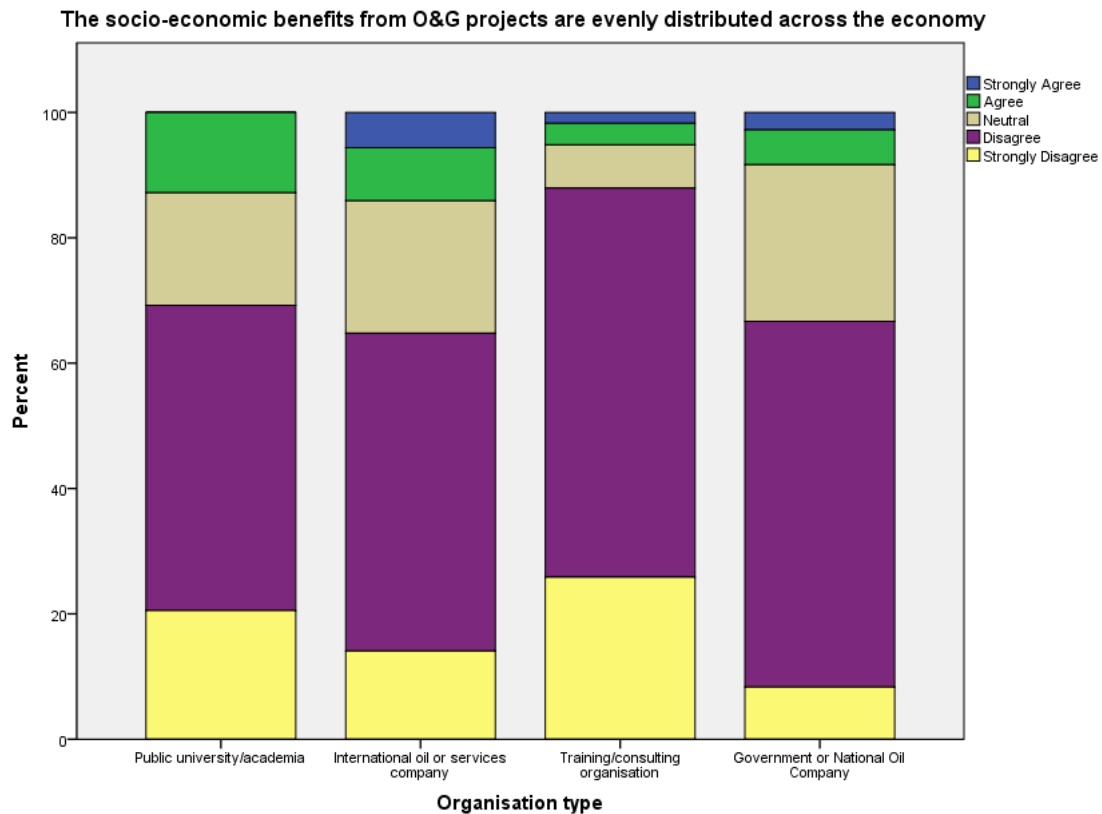


Figure 12: Responses by organisation type to “the socio-economic benefits from oil and gas projects are evenly distributed across the economy”

Difference four: investing early in local education institutions will ensure local people are trained to industry standards

204 respondents answered this question. The median response was “Agree”, whilst the most common occurring value was “Agree”. The spread of results was highly dispersed (range = 5) and by removing the outliers, the variability of results was low (interquartile range = 1).

Overall, 34.8% (N = 71) strongly agreed, 52.5% (N = 107) agreed, 6.4% (N = 13) were neutral, 4.9% (N = 10) disagreed and 1.0% (N = 2) strongly disagreed.

There was a statistically significant difference between the four organisations’ about whether investing early in local education institutions will ensure local people are trained to industry standards, $H(3) = 7.90$, $p = .048$, as shown in Figure 13. A post-hoc test using Dunn's test with Bonferroni correction showed statistically significant differences between public universities/academia and international oil or service companies, $p = .031$.

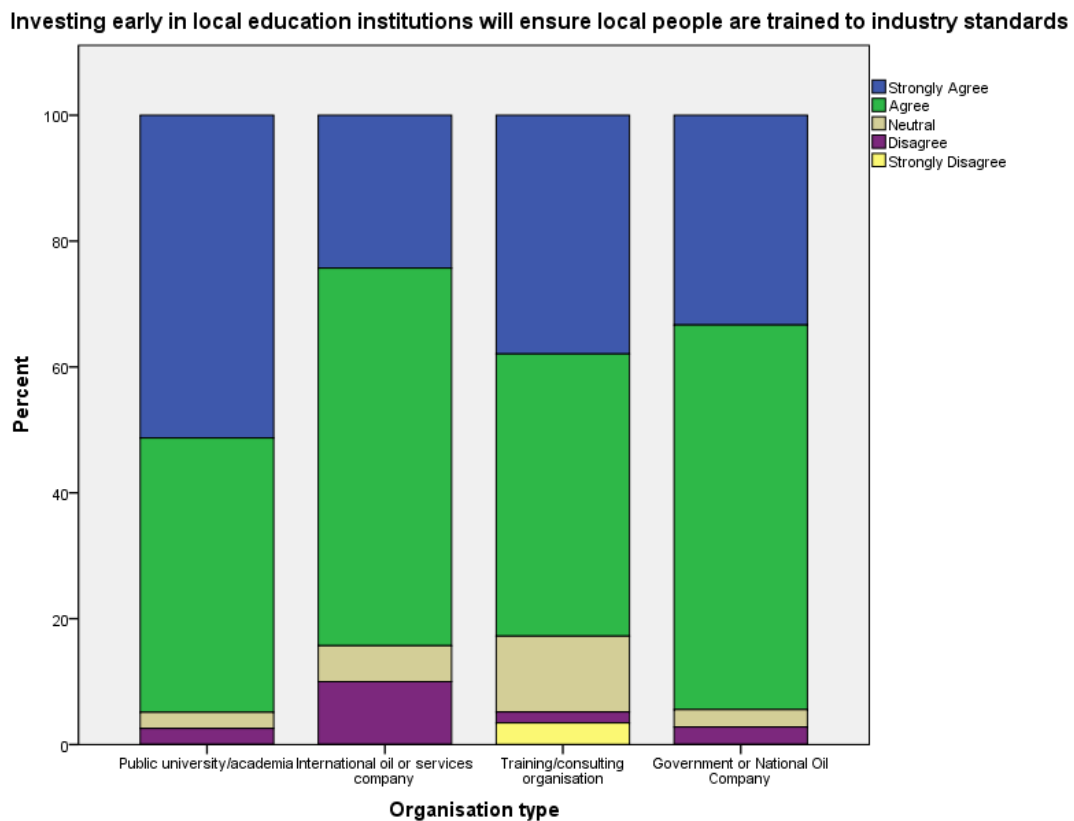


Figure 13: Responses by organisation type to “investing early in local education institutions will ensure local people are trained to industry standards”

For the remaining 15 questions the Kruskal-Wallis H test found no statistically significant differences in responses to questions between the four different categories of organisation, as shown in Table 11.

Table 11: Questions that have no statistically significant differences in responses
based on organisation type

#	Question	Kruskal-Wallis H test results
1	Expatriates are paid more than local workers within the E&P sector	$H(3) = 6.53, p = .088$
2	The mind-set is changing by governments and E&P companies for a greater need to develop a local workforce and supply chain	$H(3) = 1.38, p = .711$
3	It is in the interest of E&P companies to invest in local procurement for cost savings and improved quality	$H(3) = 1.03, p = .794$
4	Enterprise development centres are the most effective way to increase local SMEs participation	$H(3) = 5.37, p = .146$
5	Governments should focus on multi-sector skills and not those specific to O&G	$H(3) = 4.149, p = .246$
6	Percentage based local content metrics do not benefit local employment	$H(3) = 0.89, p = .828.$
7	O&G operations provide nations with the greatest opportunity to grow economically	$H(3) = 4.01, p = .261$
8	It is more cost effective to build local education capacity locally than to send local people internationally for education and training	$H(3) = 3.10, p = .376$
9	Local education institutions are completely aligned with the needs of industry	$H(3) = 4.45, p = .217$
10	E&P operations in projects have more negative impacts for local communities than positive impacts	$H(3) = 4.88, p = .181$
11	Local community engagement, education initiatives and supply chain development is most effective when led by the local operations teams in country by E&P companies	$H(3) = 5.94, p = .114$
12	Employment is the greatest expectation by local people from O&G projects	$H(3) = 1.69, p = .640$
13	E&P companies work effectively together in country to develop strategies around local procurement and investment strategies for education	$H(3) = 3.94, p = .268$
14	Governments and industry can improve the way they disseminate information about employment and procurement needs to the population over the lifecycle of a project	$H(3) = 6.17, p = .104$
15	Governments of different countries within a region should work together to collaborate over specialisms within skills areas	$H(3) = 4.12, p = .250$

5.1.3 Similarities

In order to identify similarities in opinions the mode responses are presented to show the most frequently occurring responses to questions.

Strongly agree

Observing all participants' results, one question resulted in the mode response of 'strongly agree', shown in Table 12.

Table 12: Question with the mode response of 'strongly agree'

#	Mode responses of strongly agree
1	Expatriates are paid more than local workers within the E&P sector (43.1%, N = 88). 'International oil or services companies' and 'Training/consulting' organisations most frequently strongly agreed, whilst 'Government or National Oil Company' and 'Public university/academia' most frequently agreed.

This is supported by quotations drawn from the three open ended qualitative questions within the questionnaire in Table 13:

Table 13: Explanatory quotations from the questionnaire's qualitative responses

#	Quotations from open questions
1	"Expats do generally get paid more simply because they tend to occupy to higher paid positions", however another said "some locals get paid just as much as expatriates or more (eg Middle East Gulf states)".

Agree

Ten questions had the mode response of 'agree', shown in Table 14.

Table 14: Questions with the mode response of 'agree'

#	Mode responses of agree
1	The mind-set is changing by governments and E&P companies for a greater need to develop the local workforce and supply chain (Mode = 66.7%, N = 136). All categories of organisation most frequently agreed.
2	Governments should focus on multi-sector skills and not those specific to O&G (Mode = 45.1%, N = 92). All categories of organisation most frequently agreed.
3	O&G operations provide nations with the greatest opportunity to grow economically (Mode = 36.8%, N = 75). 'International oil or services companies' and 'Training/consulting' organisations most frequently answered neutral, whilst 'Government or National Oil Company' and 'Public university/academia' most frequently agreed.
4	It is more cost effective to build local education capacity locally than to send local people internationally for education and training (Mode = 41.7%, N = 85). 'Training/consulting' organisations most frequently strongly agreed, all other organisations most frequently agreed.
5	Governments and industry can improve the way they disseminate information about employment and procurement needs to the population over the lifecycle of a project (Mode = 57.4%, N = 117). All categories of organisation most frequently agreed.
6	Governments of different countries within a region should work together to collaborate over specialisms within skills areas (Mode = 57.4%, N = 117). All categories of organisation most frequently agreed.
7	Local community engagement, education initiatives and supply chain development is most effective when led by the local operations teams in country by E&P companies (Mode = 49.0%, N = 100). All categories of organisation most frequently agreed.
8	Employment is the greatest expectation by local people from O&G projects (Mode = 52.5%, N = 107). 'Public university/academia' most frequently strongly agreed, all other organisations most frequently agreed.
9	It is in the interest of E&P companies to invest in local procurement for cost savings and improved quality (Mode = 50.5%, N = 103). All categories of organisation most frequently agreed.
10	Investing early in local education institutions will ensure local people are trained to industry standards (Mode = 52.5%, n = 107). 'Public university/academia' most frequently strongly agreed, all other organisations most frequently agreed.

This is supported by quotations drawn from the three open ended qualitative questions within the questionnaire in Table 15:

Table 15: Explanatory quotations from the questionnaire’s qualitative responses

#	Quotations from open questions
1	Awareness that “a holistic, collaborative approach with all stakeholders having a part to play” is necessary as “building workforce capability is always of value”.
2	“Developing transferable skills so that the success of interventions is not vulnerable to market fluctuations or the fate of individual projects”.
3	“The biggest success will be the economic benefits that it provides the nation and... jobs will be created for locals and the economic chain effect will happen within the local community”.
4	The “advantage of training locally in partnership with renowned institutions at an effective cost compared to sending few nationals for training overseas. It also helped building capacity in local training institutions”.
5	It is necessary to “communicate clearly on your employment needs and the fluctuations in employment demand so as to manage expectations”.
6	“Cross national collaboration between education and training providers”, as “working together across borders to create holistic learning hubs so we are sharing knowledge, resources and costs”.
7	“Calibrating the expectations of the business community with the reality of what operators on the ground can actually do” must be locally done due to “a lack of understanding from internal middle management of the benefits investment in local content”.
8	“Expectations on skills development and time to develop not aligned to reality”.
9	“Work out clear procurement strategies amongst all stakeholders and supporting businesses” and “build capacity through investing in the future”.
10	It is important to “engage early with national and local education authorities”, as this can lead to an “improvement of local institutions to train the local population to industry standards”.

Disagree

Six questions resulted in “disagree” as the mode response, shown in Table 16.

Table 16: Questions with the mode response of ‘disagree’

#	Mode responses of disagree
1	All job roles should be localised rather than using expatriate labour (Mode = 43.1%, N = 88). ‘Training/consulting’ organisations most frequently agreed, all other organisations most frequently disagreed.
2	National and local governments are completely aligned in their national development strategies (Mode = 50.0%, N = 102). All categories of organisation most frequently disagreed.
3	Socio-economic benefits from O&G projects are evenly distributed across the economy (Mode = 54.9%, N = 112). All categories of organisation most frequently disagreed.
4	Local education institutions are completely aligned with the needs of industry (Mode = 66.2%, N = 135). All categories of organisation most frequently disagreed.
5	E&P operations in projects have more negative impacts for local communities than positive impacts (Mode = 52.9%, N = 108). All categories of organisation most frequently disagreed.
6	E&P companies work effectively together in country to develop strategies around local procurement and investment strategies for education (Mode = 39.2%, N = 80). All categories of organisation most frequently disagreed.

This is supported by quotations drawn from the three open ended qualitative questions within the questionnaire in Table 17:

Table 17: Explanatory quotations from the questionnaire’s qualitative responses

#	Quotations from open questions
1	“A balanced approach is needed in managing expatriate and local workforce”.
2	“Alignment with local/national/regional governments” with “one clear direction from government, not mixed messages from different parts of government”.
3	“The financial resources from the exploitation of O&G must serve for the development of the country as a whole and not only for the region where the discoveries were made”.
4	“Partnerships are so important – industry cannot work independent of universities” and “there should be regular quality assurance standards on the curriculums offered”.
5	“O&G projects have a huge capacity to bring tangible benefits to a local population and nations. However the interests of the locals, governments, clients and contractors all need to be addressed and aligned”.
6	“Companies do not coordinate enough within a region to reach economies of scale and save costs on suppliers on tender procedures, training facilities, local content programs”.

Neutral

Two questions resulted in “Neutral” as the mode response, shown in Table 18.

Table 18: Questions with the mode response of ‘neutral’

#	Mode responses of neutral
1	Enterprise development centres are the most effective way to increase local SMEs participation (Mode = 48.5%, N = 99). ‘Government or National Oil Company’ were most likely to agree, all three other organisation types were neutral.
2	Percentage based local content metrics do not benefit local employment (Mode = 33.3%, N = 68). ‘Government or National Oil Company’ were most likely to agree, all three other organisation types were neutral.

This is supported by quotations drawn from the three open ended qualitative questions within the questionnaire in Table 19:

Table 19: Explanatory quotations from the questionnaire’s qualitative responses

#	Quotations from open questions
1	“An impetus to nurturing existing local companies and also in developing an entrepreneurial environment”.
2	“Blunt employment targets (%) often lead to unintended consequences... no real employment or upskilling was achieved”.

There were no mode responses of strongly disagree within the questionnaire results.

5.1.4 Questionnaire reliability

No questions required reverse scores, as there were no reverse phrased questions within the questionnaire. The Likert questions had an acceptable degree of reliability, whereby internal consistency was reliable, indicated by Cronbach’s $\alpha = .702$.

5.2 Results - hypothesis two

Hypothesis two sought to explore whether specific national characteristics exist that affect JRL. This was achieved through qualitative analysis of twenty one interviews and one group interview about the Ghanaian context.

80 Ghana specific factors associated with JRL were found. 14 themes emerged and these were further categorised into four key overarching categories, 'Government', 'Labour Market', 'Industry' and 'Multi-stakeholder'. The 14 themes of the factors are presented in Table 20.

Table 20: Themes by category affecting job role localisation in Ghana

Category	Themes	Factors in theme (N)
Government	1. Government & legislation	N = 7
Labour market	2. Common traits of the Ghanaian workforce	N = 10
	3. Higher and vocational education & training	N = 9
	4. Experience and time to competency	N = 5
	5. Labour market challenges	N = 8
	Industry	6. Expatriate employees
	7. O&G job & supply chain opportunities	N = 2
	8. Local community engagement	N = 1
Multi-stakeholder	9. Collaboration, communication & expectation management	N = 7
	10. Culture and trust	N = 3
	11. Localisation of the workforce	N = 9
	12. Impact of O&G in Ghana	N = 4
	13. External international activities	N = 2
	14. Local hiring in Ghana	N = 8

The following section presents the results for each category, providing quotations from the interviews to describe the factors within each theme.

5.2.1 Government category

Within the Government category there was one theme affecting JRL (see Table 20).

Government & legislation theme

Table 21 presents the seven factors of the 'government & legislation' theme that impact JRL in Ghana. The table includes a selection of quotes from the semi-structured interviews and group interview to explain each factor.

Table 21: 'Government & legislation' theme

#	Factors	Quotation
1	New GoG in place	"New government in place who are very much pro-business, they are seeking to grow the economy", however with that comes "a lack of continuity".
2	New Petroleum Commission board	"The Petroleum Commission is awaiting a new board, which is impacting decision making"
3	More local capacity development needed	"There is no conscious effort to really develop local capacity."
4	Government agency differentiation	"A lot of distinction" and "strong communication between the different institutions within the government".
5	Petroleum Commission localisation plan issues	The Petroleum Commission "have a framework in place with the companies about when a position should be localised" however "the Petroleum Commission doesn't understand really what a job entails".
6	Petroleum Commission monitoring companies localisation plans	Companies "provide the strategic plan for the expatriate positions and the timeline of localisation as well as training programs for successors and the time it would take to take over those positions. The Petroleum Commission then monitors the progress" which is "fixed and monitored every quarter".
7	90% localisation target in 10 years	"Objective to achieve 90% localisation by 10 years' time" and "the LI has strict requirement of within 10 years get to 90%" but industry has challenges for "how do we fit within the fixed localisation period/timeline already put in place by the law?"

5.2.2 Labour market category

Within the Labour Market category there were four themes affecting JRL (see Table 20).

Common traits of the Ghanaian workforce theme

Table 22 presents the ten factors of the 'common traits of the Ghanaian workforce' theme and a selection of explanatory quotes.

Table 22: 'Common traits of the Ghanaian workforce' theme

#	Factors	Quotation
1	Respect of hierarchy whilst deferential, non-confrontational and not taking initiative	Ghanaians have a "humble culture" associated with "hierarchy issues" meaning Ghanaians can be "deferential and not too keen on confrontation" creating a perception that "Ghanaians are timid, doesn't want to take initiative and that they are awaiting instructions".
2	Positive and polite	Ghanaians are "very positive as nationals, they are very polite" but "do not like talking about problems or things that have failed".
3	Entrepreneurial, pride and keen to advance	"Ghanaians have an entrepreneurial mind-set", "are keen to learn keen to be qualified" and "incredibly proud to work for the company".
4	Safety attitude	Issue of "attitude towards safety" with "a lack of a safety culture, people will cut corners" and a "general malaise towards competency".
5	Not saying 'no' or 'I don't know'	"Ghanaians don't want to be seen to say no" or "I don't know" and "in Ghana people do not want to be viewed as stupid".
6	Dealing with multiple cultures	Ghanaians "need the ability to deal with different types of people" in Ghana's O&G sector.
7	Punctuality	"Punctuality, this needs to be built into the culture".
8	Commitment and self-motivation	"We need to be committed" and "self-motivation" is essential in Ghana's O&G sector.
9	Verbal and written communication	"Culture of people speaking over each other" and "written skills" and "presentation skills" are "frequently not good".
10	Teamwork with multiple cultures	In O&G "working alone is impossible and you need different members of a team to come together", "there is a real need to understand each other's working culture".

Higher and vocational education & training theme

Table 23 presents the nine factors of the ‘higher and vocational education & training’ theme and a selection of quotes to support the factors.

Table 23: ‘Higher and vocational education & training’ theme

#	Factors	Quotation
1	Gap between education and industry	“Ghana’s academic level is quite good” but a “huge gap between training provided and what is required by the O&G industry” meaning the “level of knowledge was very low”
2	Many institutions providing oil courses	“There are lots of universities doing training for O&G for example KNUST”
3	Standards, quality and curriculum	“Issues over public education and curriculum development” in universities “but do they know anything, and who does the curriculum?” with differing “standards from different universities”.
4	Technical and vocational education stigma	“In Ghana there is a stigma about vocational jobs, everyone wants to go to university and polytechnics are a second choice”.
5	Lack of lab equipment	“Without the latest technology or equipment to learn with”.
6	Limited industry-education links	“No interaction really with industry” yet “the relationship of companies with institutions is very important in Ghana, however this is limited”
7	Theoretical and not practical learning	“Education is primarily done through rote learning, there is little hands on or practical learning”.
8	HSE not taught	“At university you may see a hazard, but you just don’t see it” and “there was no safety being trained”
9	Education successes	“JTTC is the only facility in Ghana that can offer... offshore related industry learning” and “Field Ready... at JTTC can... produce good quality employable people” and “RMU there is a fantastic welding centre that MODEC built”.

Experience and time to competency theme

Table 24 presents the five factors of the ‘experience and time to competency’ theme and a selection of explanatory quotes.

Table 24: ‘Experience and time to competency’ theme

#	Factors	Quotation
1	Experience as a barrier	“The biggest issue is the lack of experience” as “the O&G Industry is young so it is difficult to find people with 10 to 12 years’ worth of experience”. As “certain positions with a lot of technical background or a lot of knowledge of the company”.
2	Government awareness of localisation timeframes	“The Petroleum Commission need to understand that it takes years to localise ... and some roles are hard to localise”. “It takes time to employ local Ghanaians this can’t be rushed”.
3	Hands on training barriers	“Frustrations as experience cannot be given on board the vessel”... “need to get them offshore”.
4	Industry send Ghanaians overseas for training	“One-year training course with their internal university”. They explained they “also did some training in Ghana, the rest was direct experience in the field with six months was on the job training and six months was theory”.
5	O&G companies need flexible experience requirements	“Customers... will turn [CVs] down if they don’t have five years’ experience however we’re trying to get them to have two years of experience to meet the local content policy”.

Labour market challenges

Table 25 presents the eight factors of the 'labour market challenges' theme and a selection of explanatory quotes.

Table 25: 'Labour market challenges' theme

#	Factors	Quotation
1	Accessing the diaspora	"Very passionate about developing the industry in Ghana" but " would get fed up with going for interviews and not getting enough money on offer even close to what they were being paid internationally".
2	Few women	"Very few women in the O&G Industry in Ghana", "there is a culture in Ghana that women are the holders of the family and do not do technical job roles".
3	Workforce preparation responsibility	"It is not the job of the O&G companies to create employment it is the job of the government for creating employment for local people."
4	Access to work permits	"There is currently a major issue around work permits however there is a need to build up experience".
5	National service & youth employment	"120 thousand people who go on National Service every year" and "important to give national service graduates meaningful roles" as "youth employment is particularly important"
6	Need for mentors	"There is a major need within this industry to have mentors".
7	Quality of commercial training centres	"There are private training companies out there. Are those institutions affiliated to industry? What is the government's role in regulating them?"
8	Pigeon English	"Sometimes there is a language barrier for example pigeon English... It is like a foreign language, it's a mix of local languages."

5.2.3 Industry category

Within the Industry category, there were three themes affecting JRL (see table 20).

Expatriate employees theme

Table 26 presents the five factors of the ‘expatriate employees’ theme and a selection of explanatory quotes.

Table 26: ‘Expatriate employees’ theme

#	Factors	Quotation
1	Expatriate vs. local wage gap	“A big difference between expatriates and locals, the difference was huge” and “policies of remuneration for Ghanaians are an issue.”
2	Negative perceptions of expatriates in Ghana	“Ghanaians perceive that expatriates get paid more, take money away from our country and have good lives”.
3	Company trust of expatriates	“O&G companies are very comfortable bringing their own people who they can trust from overseas”
4	Expatriate buy-in to localisation	“You need to discipline supervisors into localisation because actually localisation it puts them out of a job... localisation is seen as a dirty word”.
5	Local understanding the need for expatriates	“Experienced local people accept that they cannot be the supervisors because of this risk and because of their inexperience”.

Oil and gas job & supply chain opportunities theme

Table 27 presents the two factors of the ‘O&G job & supply chain opportunities’ theme and a selection of explanatory quotes.

Table 27: ‘Oil and gas job & supply chain opportunities’ theme

#	Factors	Quotation
1	Limited job opportunities	“O&G industry in Ghana there are only a small number of jobs” for example “there are only 120 beds on an FPSO”.
2	Supply chain limitations	“Few local organisations can meet the standards required” and “there is an issue that companies don’t trust the local quality”

Local community engagement opportunities theme

Table 28 presents the one factor of the ‘local community engagement’ theme and an explanatory quote.

Table 28: ‘Local community engagement’ theme

#	Factors	Quotation
1	Local perceptions impact social license to operate	“Companies do CSR because they “just want to look good” and “Tullow’s private jet, people are looking at that”

5.2.4 Multi-stakeholder category

Within the Multi-stakeholder category, there were six themes affecting JRL (see Table 20).

Collaboration, communication & expectation management theme

Table 29 presents the seven factors of the ‘collaboration, communication & expectation management’ theme and a selection of explanatory quotes.

Table 29: ‘Collaboration, communication & expectation management’ theme

#	Factors	Quotation
1	Government, industry and education mismatch	“A gap between what the government, industry and training institutions are doing”.
2	Companies working in silos	“All oil companies are doing their own thing... There are all sorts of different initiatives currently taking place”.
3	Poor communication of job opportunities	“Miscommunication of job opportunities has been a major factor” and “there is a need to demystify O&G as an industry”.
4	ECOWAS collaboration	ECOWAS could support “work in specialisms to encourage regionalisation so the particular expertise in the region”.
5	Employment expectations & disappointment	“There was huge expectations the O&G industry would drastically change lives” and “people expect to get jobs as a result of the O&G Industry”.
6	No employment in locally affected communities	“There have been no employment avenues for genuinely local people as a result of the O&G project – this has led to local discontent”.
7	Press sensationalise	“The media feeds information to the population and the media provide wrong information”

Culture and trust theme

Table 30 presents the three factors of the ‘culture and trust’ theme and a selection of explanatory quotes.

Table 30: ‘Culture and trust’ theme

#	Factors	Quotation
1	Working culture	“There’s an issue around working culture and attitude which is very different from European working culture” and “doing business in Ghana as an outsider is very challenging. Processes take longer to achieve”.
2	Trust of local work ethic	“There is an issue of trust”... “there is a challenge of perception of Ghanaian people’s work ethic amongst the IOCs, they believe expatriates will work harder”.
3	Corruption in Ghana	“Corruption is an issue in Ghana. It is played down and not talked about as much”

Localisation of the workforce theme

Table 31 presents the nine factors of the ‘localisation of the workforce’ theme and a selection of explanatory quotes.

Table 31: ‘Localisation of the workforce’ theme

#	Factors	Quotation
1	Localisation is sustainable	“Localisation is the only way forward”, it is an “economic and political imperative to embrace localisation” and “it’s important to avoid lip service”.
2	All roles can be localised with time	“Theoretically there are no positions that cannot be localised, it is just a matter of time”.
3	Localisation can save money	“Problems in Nigeria it cost companies billions of dollars” and “in the long run it is cheaper if you can hire locally”.
4	Localisation examples of success	“Tullow Oil’s Ten project a lot of positions have been localised” and “Tullow Oil has recently appointed a Ghanaian OIM”.
5	Risk of early promotion	“Problems of promoting the wrong person or doing it too early” so “companies need to identify talent in their organisation of top level Ghanaians”.
6	Strict regulations	“If companies do not meet targets there are sanctions”.
7	L.I.-2204 not known locally	“The local content LI is not generally known by locals”.
8	At the core of business	Localisation is “an economic case more than CSR case”.
9	Localisation creates economic growth	“Employment will come primarily in technical roles and through these technical roles you can build an economy and people can build companies”.

Impact of oil and gas in Ghana theme

Table 32 presents the four factors of the 'impact of O&G in Ghana' theme and a selection of explanatory quotes.

Table 32: 'Impact of oil and gas in Ghana' theme

#	Factors	Quotation
1	National benefit from O&G	"There needs to be benefit felt by the whole nation". As "in the Eastern Region they can't see any positive impact - the oil is in the Western Region".
2	Discontent with O&G impact	"In Ghana there is discontent" with a "big thinking locally that there is not enough impact".
3	Resource curse and Dutch disease impacts	"Housing rents have shot up", "the price of local vegetables have gone up", "pressure on the roads with heavy traffic" and "fishing people have been impacted, particularly their livelihoods as they are not allowed near to the FPSO or onshore regions". "There is actually creation of increased relative poverty?"
4	Population growth locally	"People have moved from the North of the country down to Takoradi because they think there are opportunities here".

External international activities

Table 33 presents the two factors of the 'external international activities' theme and a selection of explanatory quotes.

Table 33: 'External international activities' theme

#	Factors	Quotation
1	Côte d'Ivoire border dispute	"CDI and Ghana there is a moratorium on drilling which has meant that there's been a big drop in the amount of drilling taking place in Ghana"
2	Oil price impacting recruitment	"With the oil price collapse this has impacted the business; [we] are currently on hold".

Local hiring in Ghana theme

Table 34 presents the eight factors of the ‘local hiring in Ghana’ theme and a selection of explanatory quotes.

Table 34: ‘Local hiring in Ghana’ theme

#	Factors	Quotation
1	Traditional old fashioned recruitment methods	Recruitment “approach is very old fashioned” and “primarily recruit through newspapers, the biggest newspaper in Ghana is the Daily Graphic”.
2	Competition for top talent	“Finding top talent is particularly hard, as there are limited locally really good people”.
3	Other sectors for skills	“Why not transition people who have worked in the mining industry to the O&G sector”.
4	Willingness to do certain jobs	“A factor to consider is the willingness of people to do particular job roles”.
5	New local managers want to negotiate the best deal	“People always want to make sure they secure the best possible deal, and wanted as much as possible, stretched the limits, as well as their ego massaged”.
6	Transferable roles easiest to fill	“Things like the project team, sourcing project managers, scheduling, quality, health and safety, logistics”.
7	Employment of less educated is needed	“It’s not just about the educated people that you create jobs for but it’s also can you create jobs for those about education for people like you cleaning staff security front of house”.
8	Industry is responsible for hiring, but risks are high	“Finding appropriately trained people is the issue of the companies, and not the issue of the government.” However “the risks are high for example an experience can cause real damage to equipment and can cause death”.

5.3 Results - hypothesis three

Hypothesis three was tested using a decision tree methodology to analyse the viability of localising job roles. This was achieved by accessing job role data from Eni Ghana for a sample of ten job roles.

The ten job roles were selected by Eni Ghana's HR Manager and consisted of five expatriate job roles and five local job roles, as they currently exist. The decision tree was categorised using Eni's standard job specifications, the results from the survey and the interviews, the literature review and Ghanaian legislation.

All ten roles were tested using the decision trees with a member of Eni Ghana's HR department for a 2017 scenario. Then, the five expatriate job roles were tested for ten years' time in 2027, when Eni Ghana are legislated to achieved the target of 90% localisation. Screenshots of each stage of the decision tree are included in Appendix C.4. Additionally, electronic versions of the full standardised decision tree and all fifteen pruned decision trees have been submitted electronically.

The breakdown of the legislated quotas within LI-2204 (Petroleum Commission, 2013) for Ghanaians employed within each job role category are: Management staff begin at 30%, then 50%-60% at five years and 70%-80% at 10 years. Technical core staff must commence at 20%, then 50%-60% at five years and 70%-80% at 10 years. Other staff must start at 30%, then 50%-60% at five years and 70%-80% at 10 years.

The testing of the five existing local job roles gave validity to the decision tree methodology, by showing that the decision tree can be applied to any job role and not just management positions.

The following sections demonstrate the decision strategies for all the job roles in 2017 and 2027.

5.3.1 Job roles in 2017

Each job role was separately tested using the decision tree for the 2017 scenario. The final decision tree results reflected the current situation for each job role. Results found that the five expatriate job roles were correctly not localised in contrast to the five currently local roles which were appropriately filled by Ghanaian nationals. The results are shown in Table 35.

Table 35: Final decision tree results based on 2017 scenario

#	Job role in 2017	Final decision node
1	FPSO Company Rep Manager	Do not localise, develop succession plan
2	Exploration Manager	Do not localise, develop succession plan
3	Production & Maintenance Manager	Do not localise, develop succession plan
4	Negotiations & Business Development Manager	Do not localise, develop succession plan
5	Well Operations Manager	Do not localise, develop succession plan
6	Account Manager	Localise
7	Legal Manager	Localise
8	HSE Coordinator	Localise
9	ICT Manager	Localise
10	Reservoir Geologist	Localise

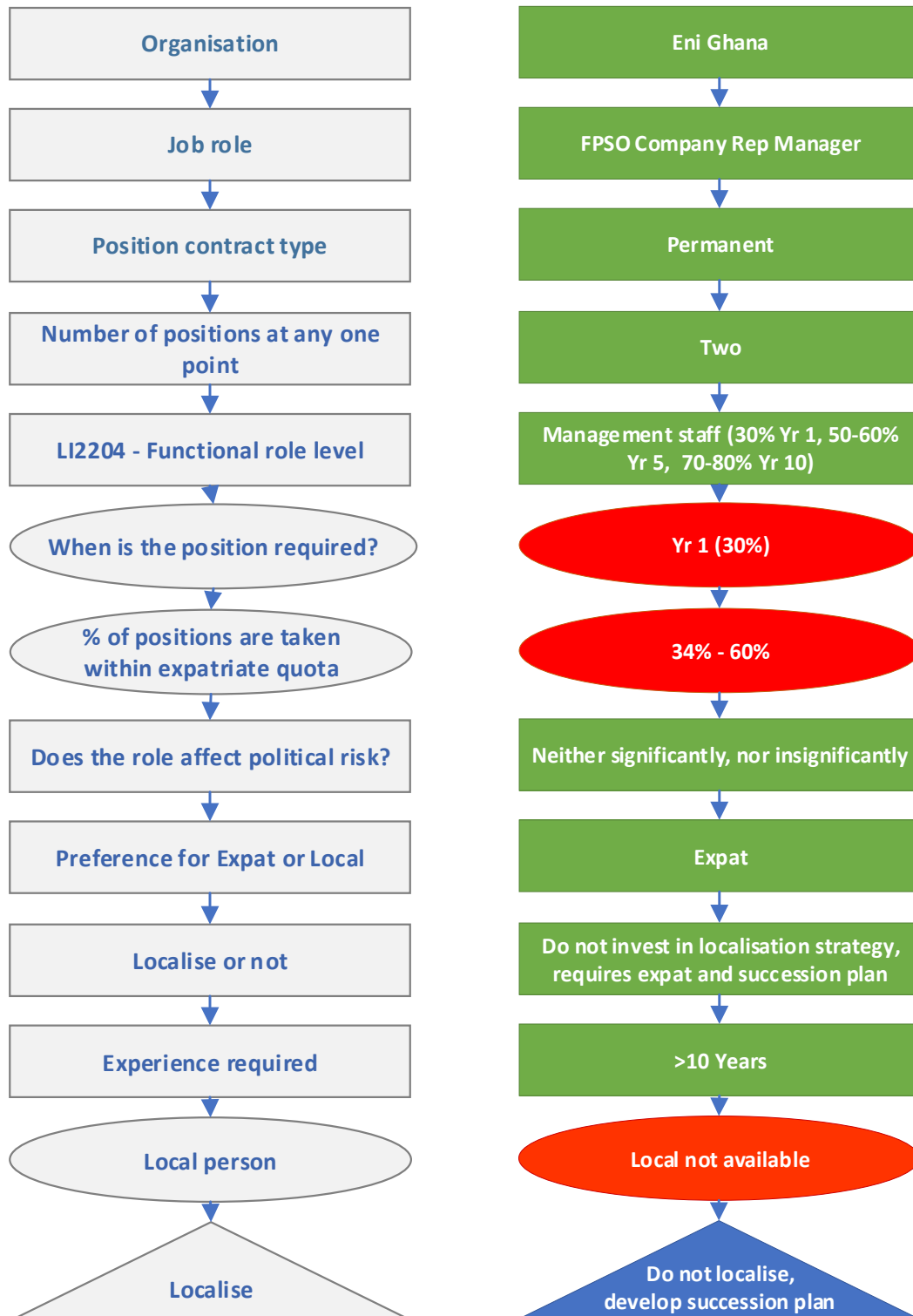
The following section describes the decision strategies for each of the ten job roles in 2017.

Role 1: FPSO Company Rep Manager – traditionally an expatriate role

A 12 stage decision strategy was undertaken for the FPSO Company Rep Manager role in 2017. The final decision was “do not localise, develop succession plan”, as shown in Flowchart 1.

The position is permanent, shared by two people working ‘back-to-back’. It is a management position required in year one of the 17 year project, when there is only a 30% requirement by the GoG for localisation of management roles.

Currently, there is no significant pressure to localise due to the percentage of positions taken by expatriates being between 34%-60%. At this stage the role does not impact political risk with stakeholders. There is a preference by Eni for this role to be held by an expatriate because the role requires significant expertise and is considered high risk due to the highly technical nature of the role. As the role requires more than ten years of experience and there is no Ghanaian available, the decision was taken not to localise, but to develop a succession plan.



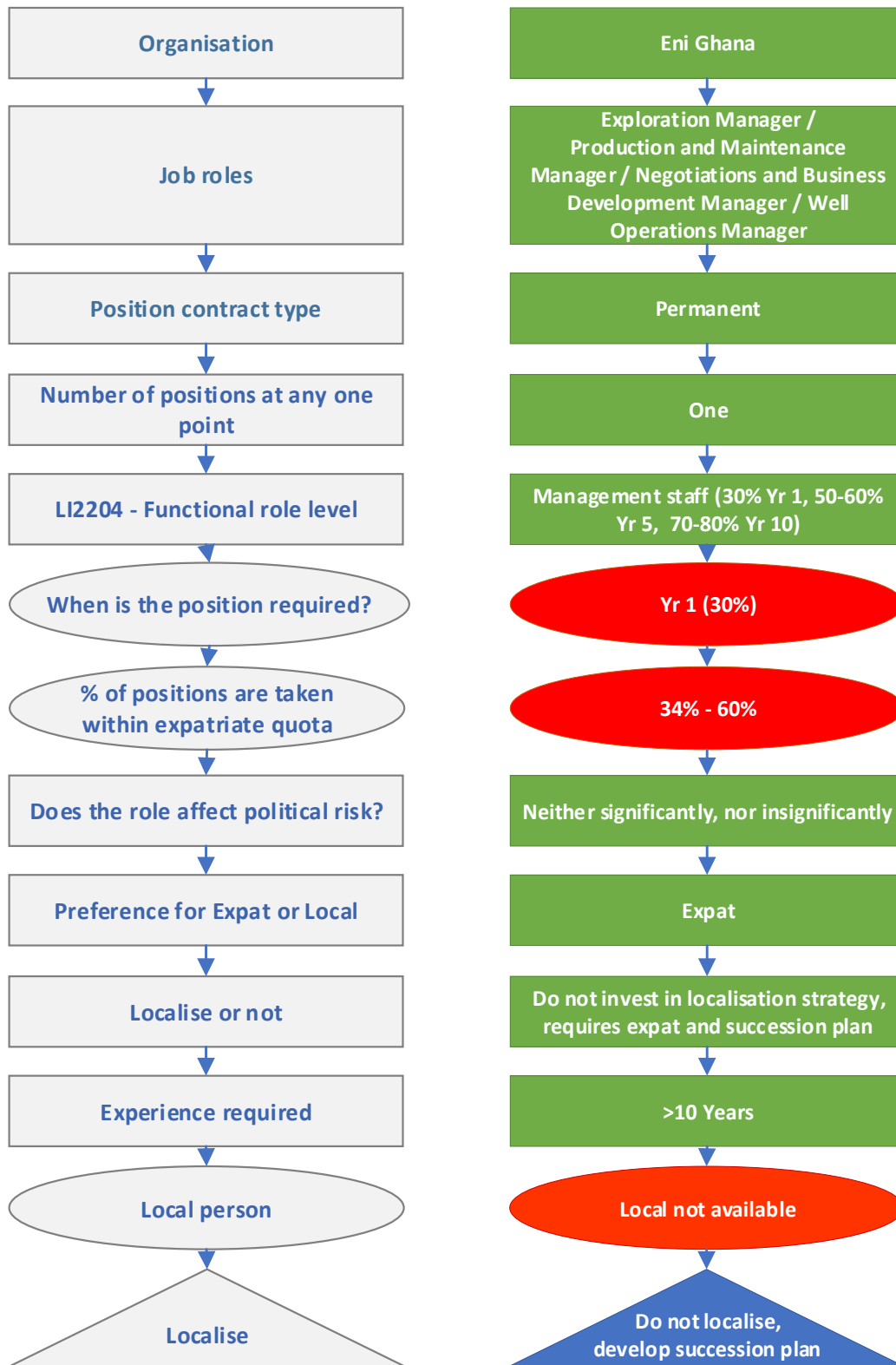
Flowchart 1: 2017 decision strategy for the FPSO Company Rep Manager role

Note that 'decision' nodes are represented by a green rectangle, chance nodes by a red circle and terminal nodes by a blue triangle, which reflects the PrecisionTree software in Appendix C.4.

Roles 2, 3, 4 & 5: Exploration Manager, Production and Maintenance Manager, Negotiations and Business Development Manager and Well Operations Manager – traditionally expatriate roles

The Exploration Manager, Production and Maintenance Manager, Negotiations and Business Development Manager and Well Operations Manager roles all had the same 12 stage decision strategy in 2017 terminating in the decision “do not localise, develop succession plan”, as shown in Flowchart 2.

In each case the position is permanent, requiring one employee. They are all management positions required in year one. There is no significant pressure to localise, and the preference of Eni Ghana is for an expatriate to hold each position. As more than ten years of experience are required and not available in Ghana, for each role the decision was not to localise but to develop a succession plan.

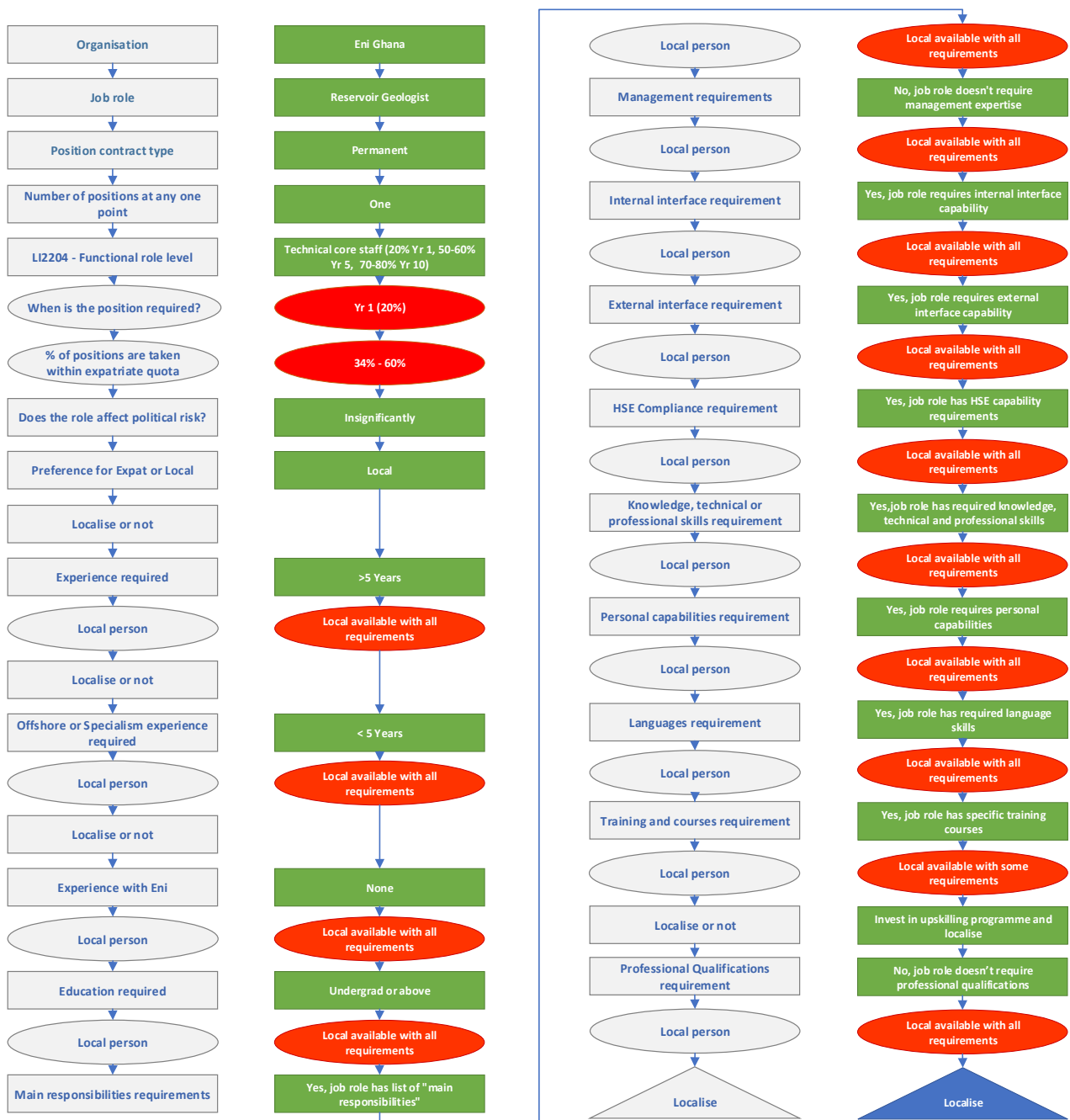


Flowchart 2: 2017 decision strategy for the Exploration Manager, Production and Maintenance Manager, Negotiations and Business Development Manager and Well Operations Manager roles

Role 6: Reservoir Geologist – traditionally a local role

A 38 stage decision tree strategy terminated in “Localise” for the Reservoir Geologist role in 2017, as shown in Flowchart 3.

The role is permanent, requiring one position at any one point in time. It is a technical role, required in year one, when 20% of technical staff roles are required to be localised. The role does not affect political risk, and a preference is for a local person. More than five years of experience is required but less than five years of specialist experience. No experience in Eni is needed. An undergraduate degree is necessary. There is a specification of main responsibilities, although it is not a management role. The role requires both internal and external interfaces. The job has HSE requirements; knowledge, technical or professional skills; personal soft skill requirements and language requirements. No professional qualifications are required. A local person is available with all these requirements. There are training requirements, and that local person will require a small amount of further training. The final decision is that this post should be localised.

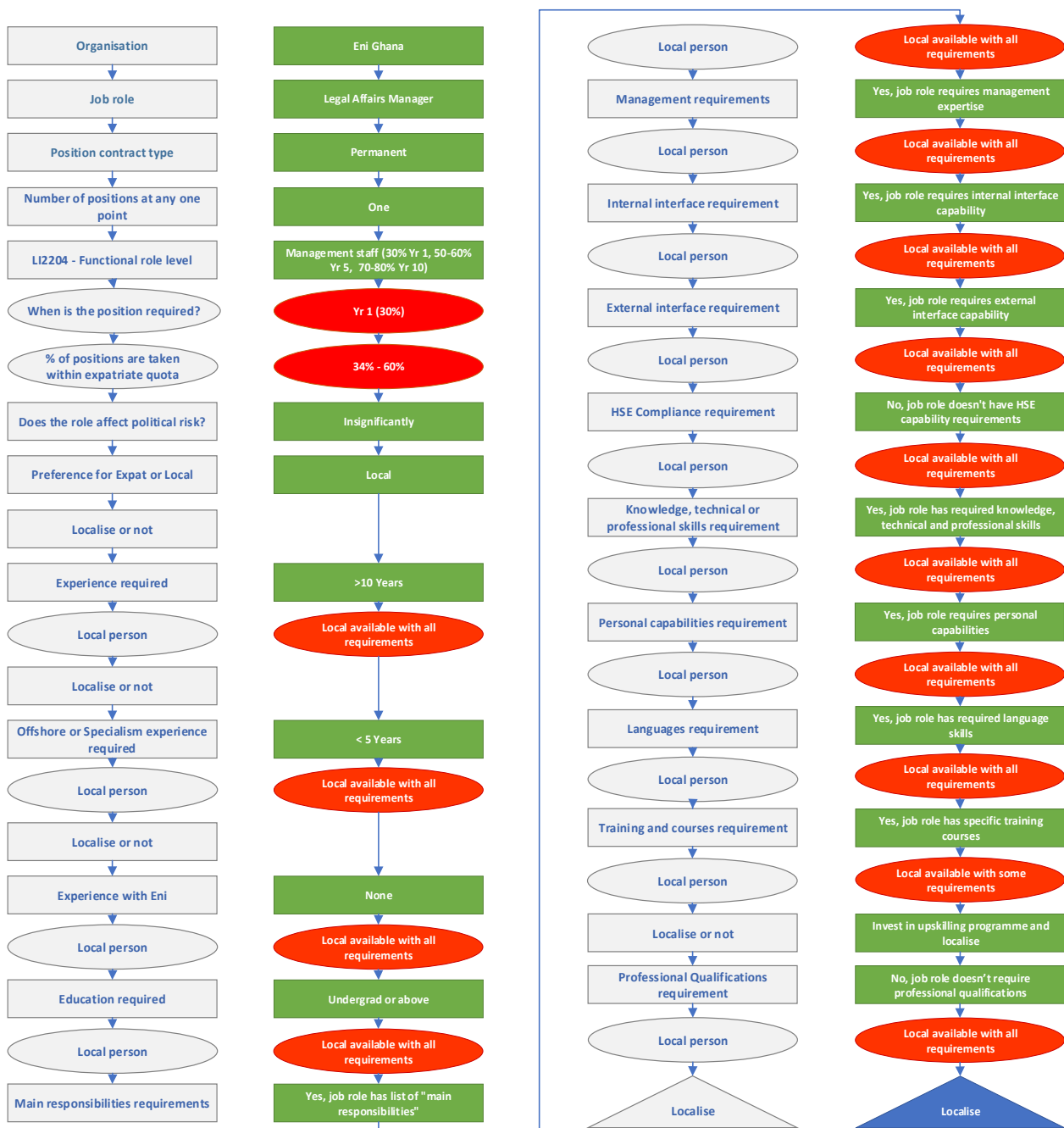


Flowchart 3: 2017 decision strategy for the Reservoir Geologist role

Role 7: Legal Affairs Manager – traditionally a local role

A 38 stage decision tree strategy terminated in “Localise” for the Legal Affairs Manager role in 2017, as shown in Flowchart 4.

The strategy replicates the Reservoir Geologist role with four differences. It is a management position in year one, when there is only a 30% requirement for localisation of management roles. More than ten years of experience is required. Additionally, the role requires management expertise; however does not have specific HSE capability requirements. As a local person is available with all requirements, the final decision is to localise.



Flowchart 4: 2017 decision strategy for the Legal Affairs Manager role

Role 8: HSE Coordinator – traditionally a local role

A 38 stage decision tree strategy terminated in “Localise” for the HSE Coordinator role in 2017, as shown in Flowchart 5.

The strategy replicates the Reservoir Geologist role with two differences. There is a requirement for more than five years of specialist experience and the role does not have specified knowledge, technical or professional skills. As a local person is available with all requirements the final decision is to localise.

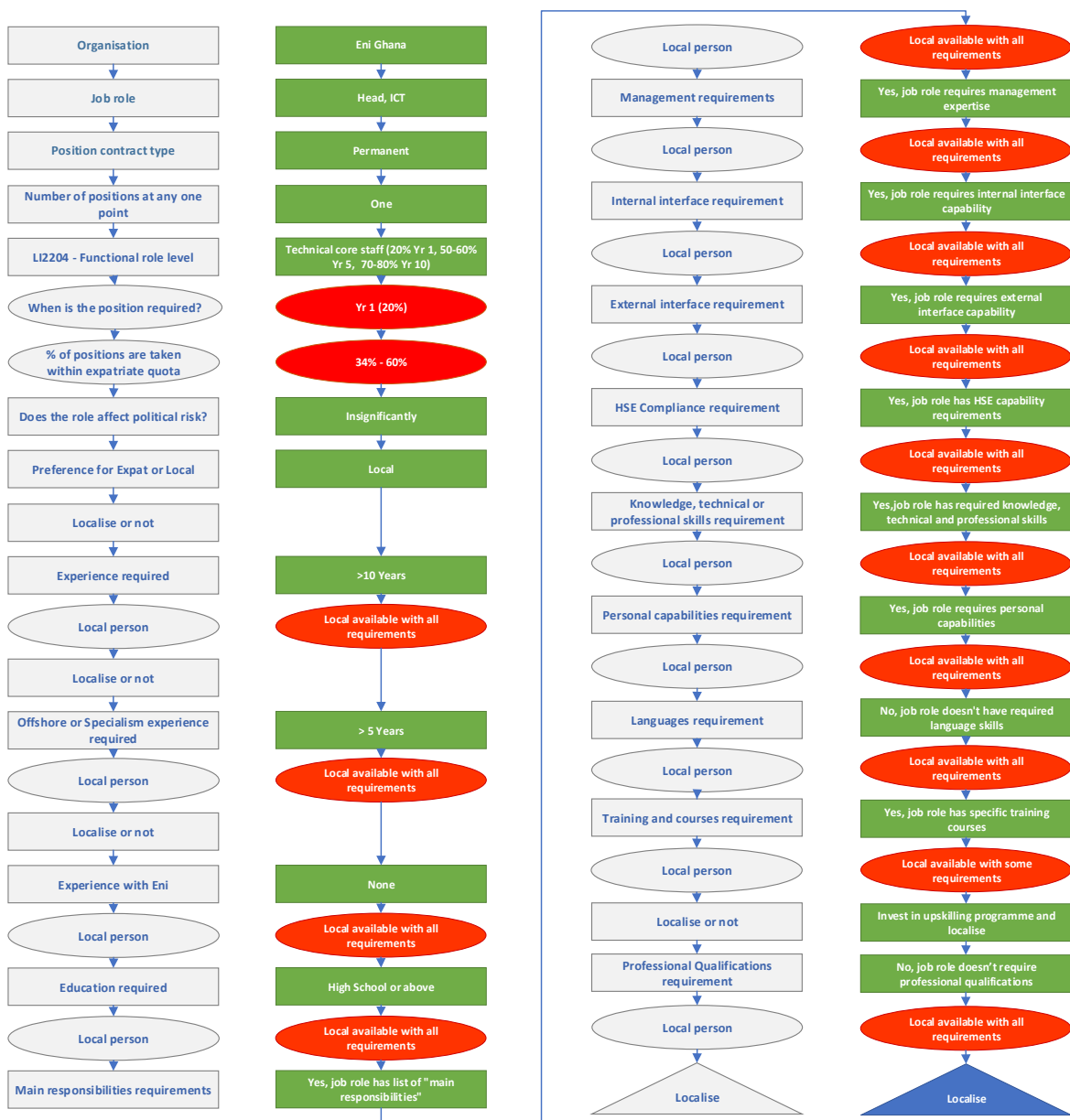


Flowchart 5: 2017 decision strategy for the HSE Coordinator role

Role 9: Head, ICT – traditionally a local role

A 38 stage decision strategy terminated in “Localise” for the Head, ICT role in 2017, as shown in Flowchart 6.

The strategy has five differences to the Reservoir Geologist role. More than ten years of industry experience is required and more than five years of specialist experience. A minimum education level of high school is needed. The role requires management expertise but no language skills are needed. As a local person is available with all requirements the final decision is to localise.

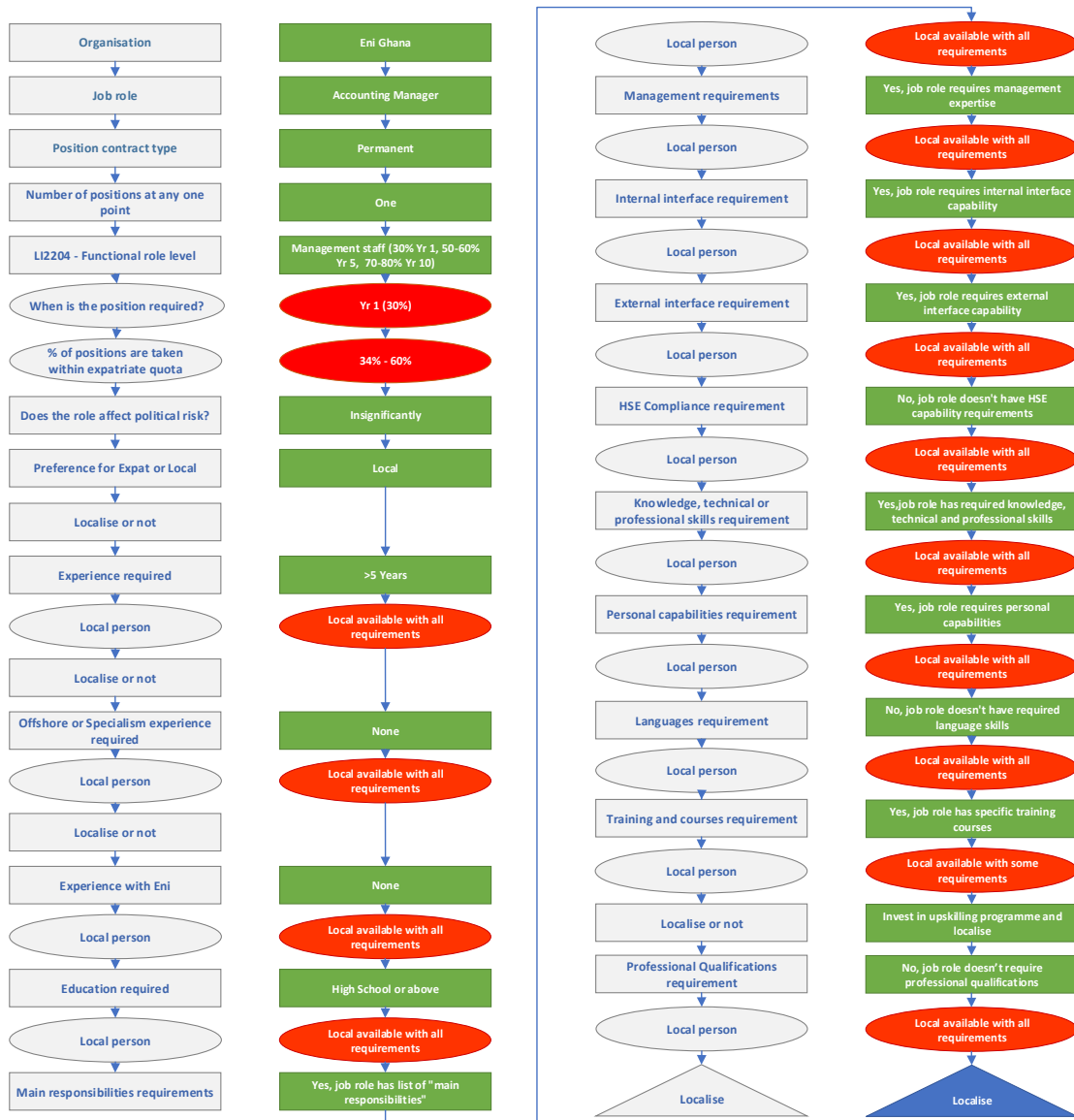


Flowchart 6: 2017 decision strategy for the Head, ICT role

Role 10: Accounting Manager – traditionally a local role

A 38 stage decision strategy terminated in “Localise” for the Accounting Manager role in 2017, as shown in Flowchart 7.

The strategy replicates the Reservoir Geologist role with five differences. It is a management position required at year one, when there is a 30% requirement for localisation of management roles. There is no specialist experienced required. Additionally the role requires management expertise; however does not have specific HSE capability or language skill requirements. As a local person is available with all requirements the final decision is to localise.



Flowchart 7: 2017 decision strategy for the Accounting Manager role

5.3.2 Job roles in 2027

Having established that the decision tree testing accurately reflected the job roles in 2017, the five expatriate job roles were tested with Eni Ghana for 2027 when Eni Ghana is due to achieve 90% localisation. The final results are presented in Table 36.

Table 36: Final decision tree results based on 2027 scenarios

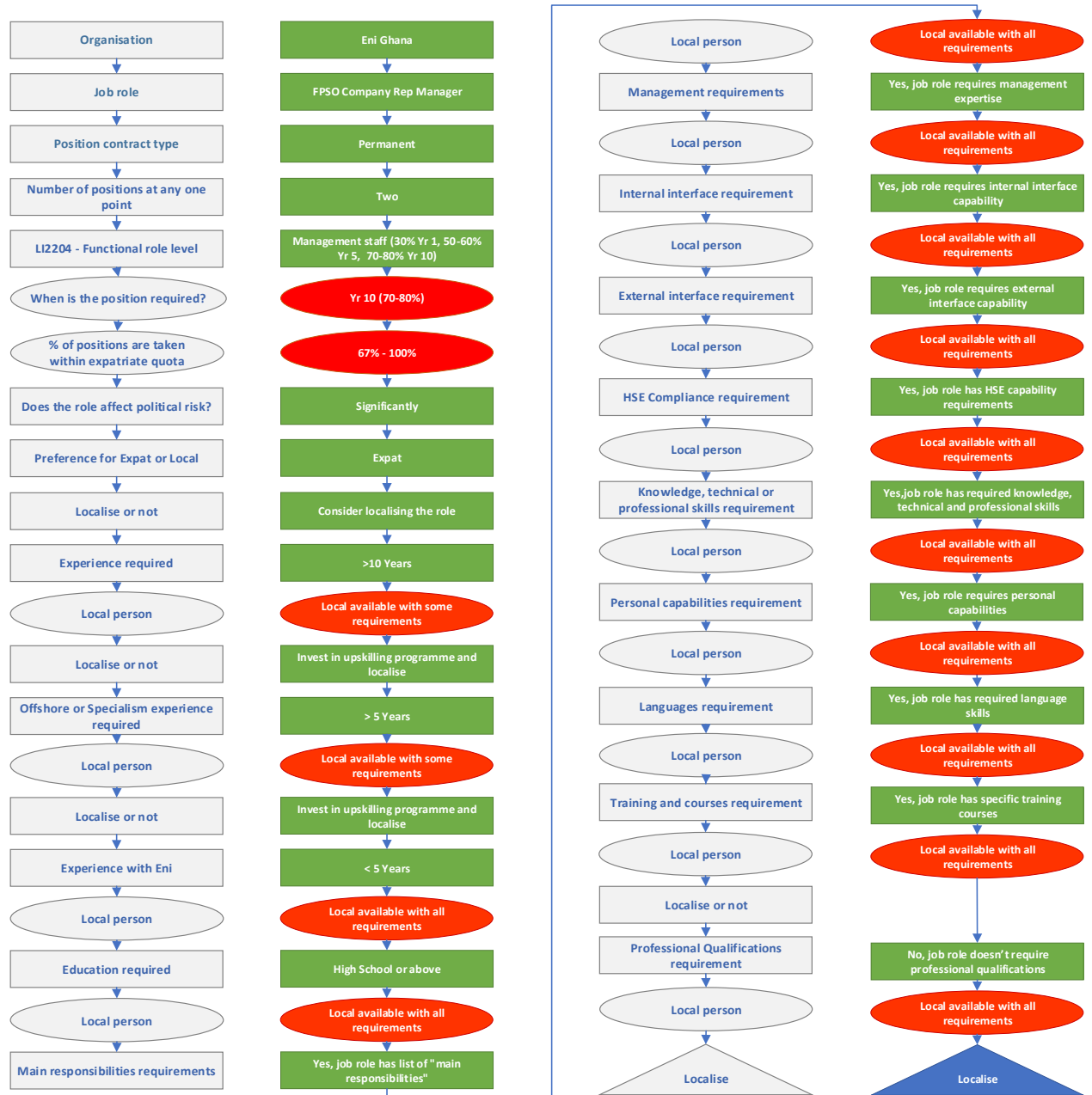
#	Job role in 2027	Final Decision
1	FPSO Company Rep Manager	Localise
2	Exploration Manager	Do not localise, develop succession plan
3	Production & Maintenance Manager	Localise
4	Negotiations & Business Development Manager	Localise
5	Well Operations Manager	Localise

Role 1: FPSO Company Rep manager - Localised

A 41 stage decision strategy predicted that the FPSO Company Rep Manager role in 2027 would be to “localise”, as shown in Flowchart 8.

In 2027, the position would remain permanent and shared by two people working ‘back-to-back’. It would remain a management position required at year ten (2027), when there would be a 70-80% requirement for localisation of management roles. There would be significant pressure to localise due to the expected percentage of positions taken by an expatriate being between 67%-100%. At this stage the role would significantly impact political risk if not localised. There would remain a preference for an expatriate, but localisation would be considered. More than ten years’ experience would still be required, it is expected that two Ghanaians would be available with the majority of the skills needed, with some upskilling needs. More than five years offshore experience would still be required. A minimum high school diploma would be required. The role has several main responsibilities: management requirements; internal and external interfaces; HSE requirements; knowledge, technical or professional

skill requirements; personal soft skills; language skills requirements and training requirements. No professional qualifications would be required. As two local people are expected to be available with all requirements the decision was to localise.

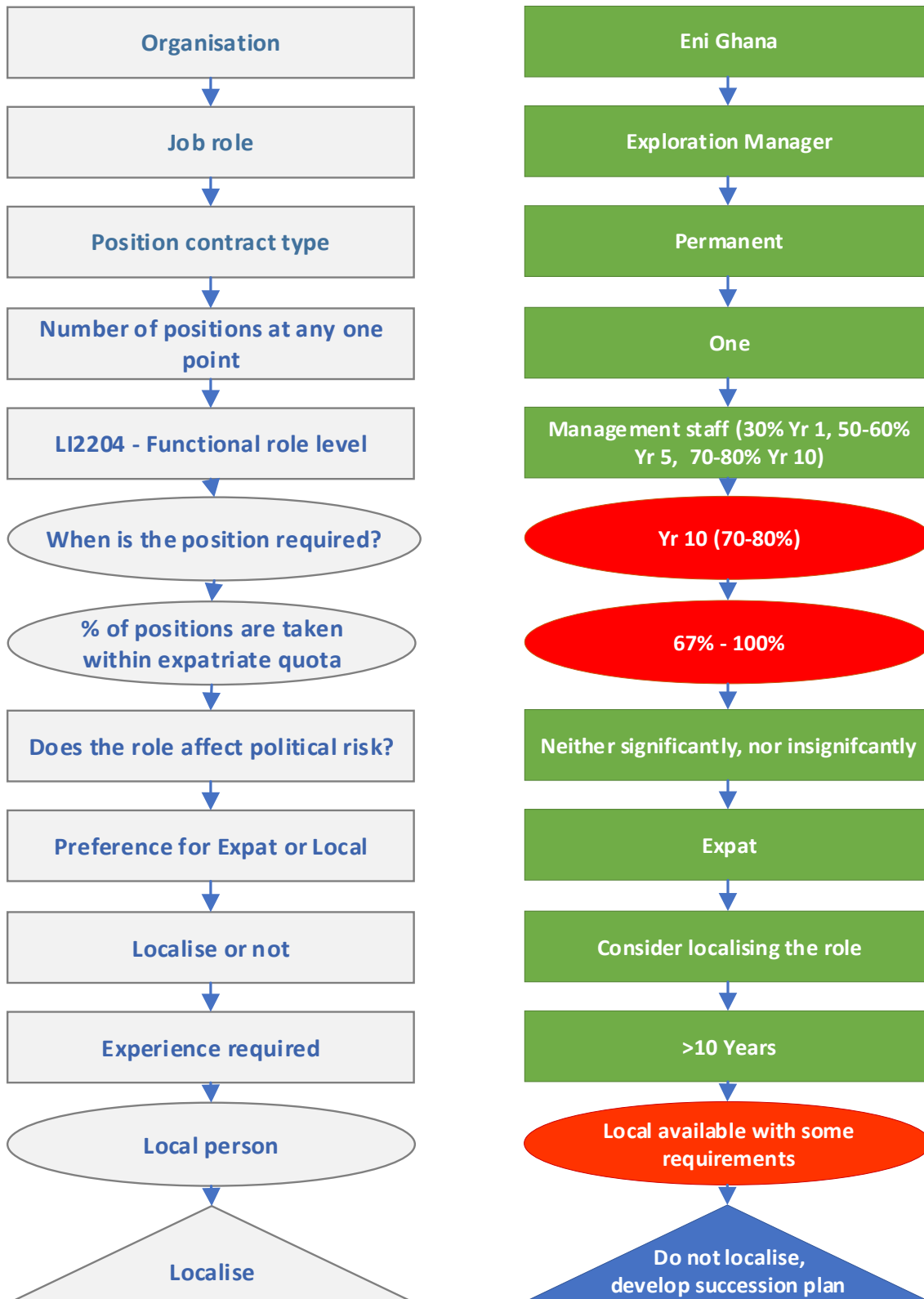


Flowchart 8: 2027 decision strategy for the FPSO Company Rep Manager role

Role 2: Exploration Manager - Remains expatriate

A 12 stage decision strategy predicts that the Exploration Manager role in 2027 would not be localised, terminating in the decision “do not localise, develop succession plan”, as shown in Flowchart 9.

In 2027 the position would remain permanent, requiring one employee. It remains a management position required at year ten (2027), with a 70-80% localisation requirement. It is expected that there would be no significant pressure to localise as it was judged that other job roles would be localised which would relieve pressure not to localise the Exploration Manager role. The preference would be for an expatriate to maintain the position. As more than ten years of experience would be required and would not be available in the Ghanaian workforce, the decision was not to localise.

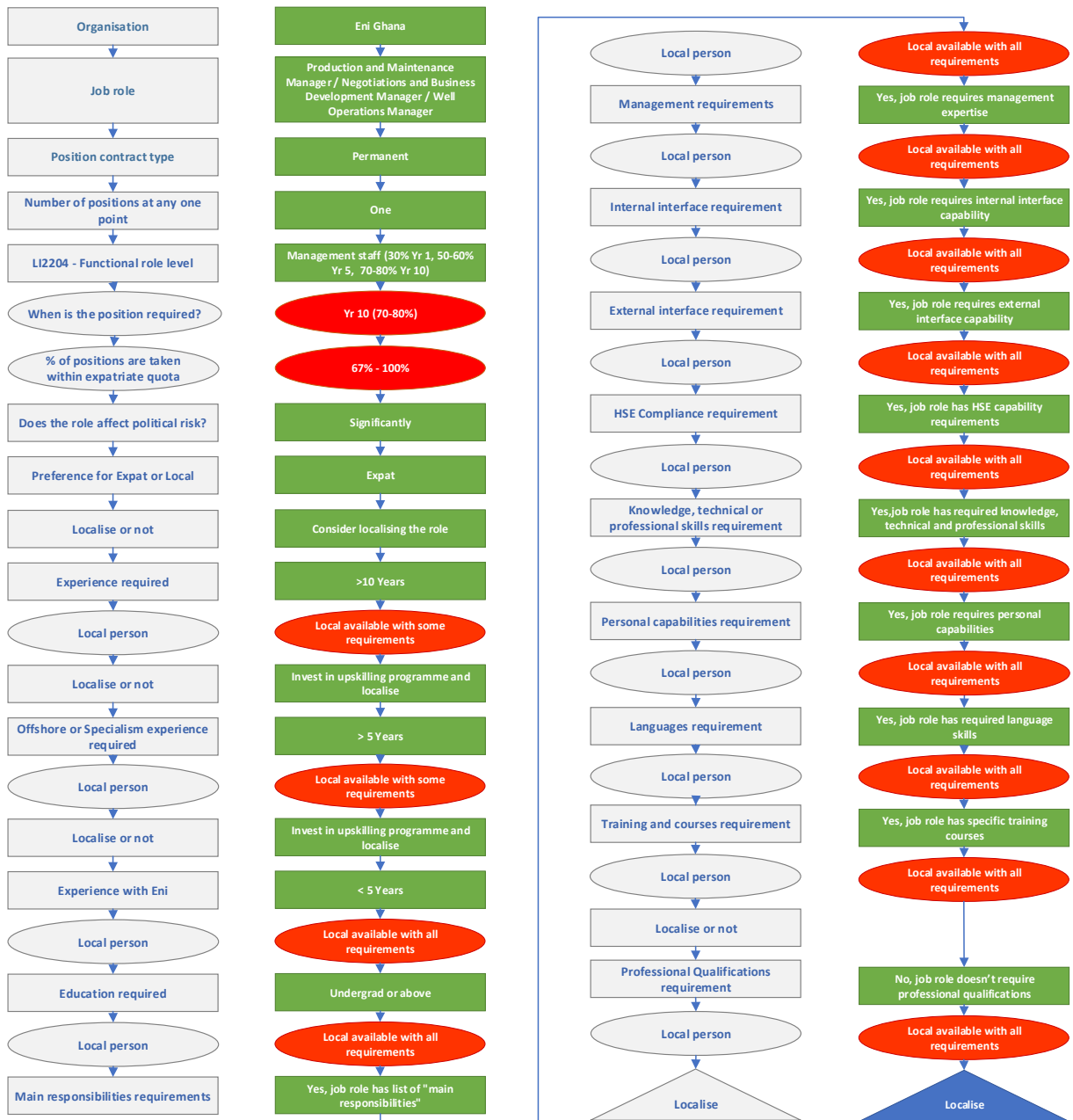


Flowchart 9: 2027 decision strategy for the Exploration Manager role

Roles 3, 4 & 5: Production and Maintenance Manager, Negotiations and Business Development Manager and Well Operations Manager - Localised

For each of the Production and Maintenance Manager, Negotiations and Business Development Manager and Well Operations Manager roles a 41 stage decision strategy predicts Eni Ghana would “localise” the roles in 2027, as shown in Flowchart 10.

As of 2027, each position would remain permanent, requiring one employee. They would remain as management positions required at year ten when there would be a 70-80% requirement for localisation of management roles. There would be a significant pressure to localise due to the high percentage of positions taken by expatriates, so localisation would be considered. More than ten years’ experience would still be a requirement and it is expected that a Ghanaian would be available with the majority of the skills needed, with some upskilling needs. More than five years specialism experience would still be needed. A minimum undergraduate degree would be necessary. The role has the main responsibilities of: management requirements; internal and external interfaces; HSE requirements; knowledge, technical or professional skill requirements; personal soft skills; language skills requirements and training requirements. No professional qualifications would be required. As a local person is expected to be available with all requirements the decision was to localise each role.



Flowchart 10: 2027 decision strategy for the Production and Maintenance Manager, Negotiations and Business Development Manager and Well Operations Manager roles

5.4 Results - hypothesis four

Hypothesis four sought to explore whether operating companies could reduce staffing costs by investing in the early training and development of local people to replace expatriates. This was achieved by applying a training and development investment timeline to the sample of five expatriate job roles, which had been modelled in the decision tree within Eni Ghana's 17 year operations phase of the OCTP project.

By communicating with Eni Ghana, ECU training organisations and universities it was possible to access data associated with relevant education, training and development programmes required for each of the five job specifications.

NPVs were calculated based on a training and development programme for a local person for each job role. This also included employment of an expatriate in each position for the first ten years and subsequent seven years employment of the locally trained person. A second NPV calculation was made for modelling costs of employing an expatriate for the total 17 years of the OCTP project's operations phase.

The results of the two scenarios were compared and showed that the costs of employing an expatriate for the total 17 year period is greater than training, developing and employing a local person.

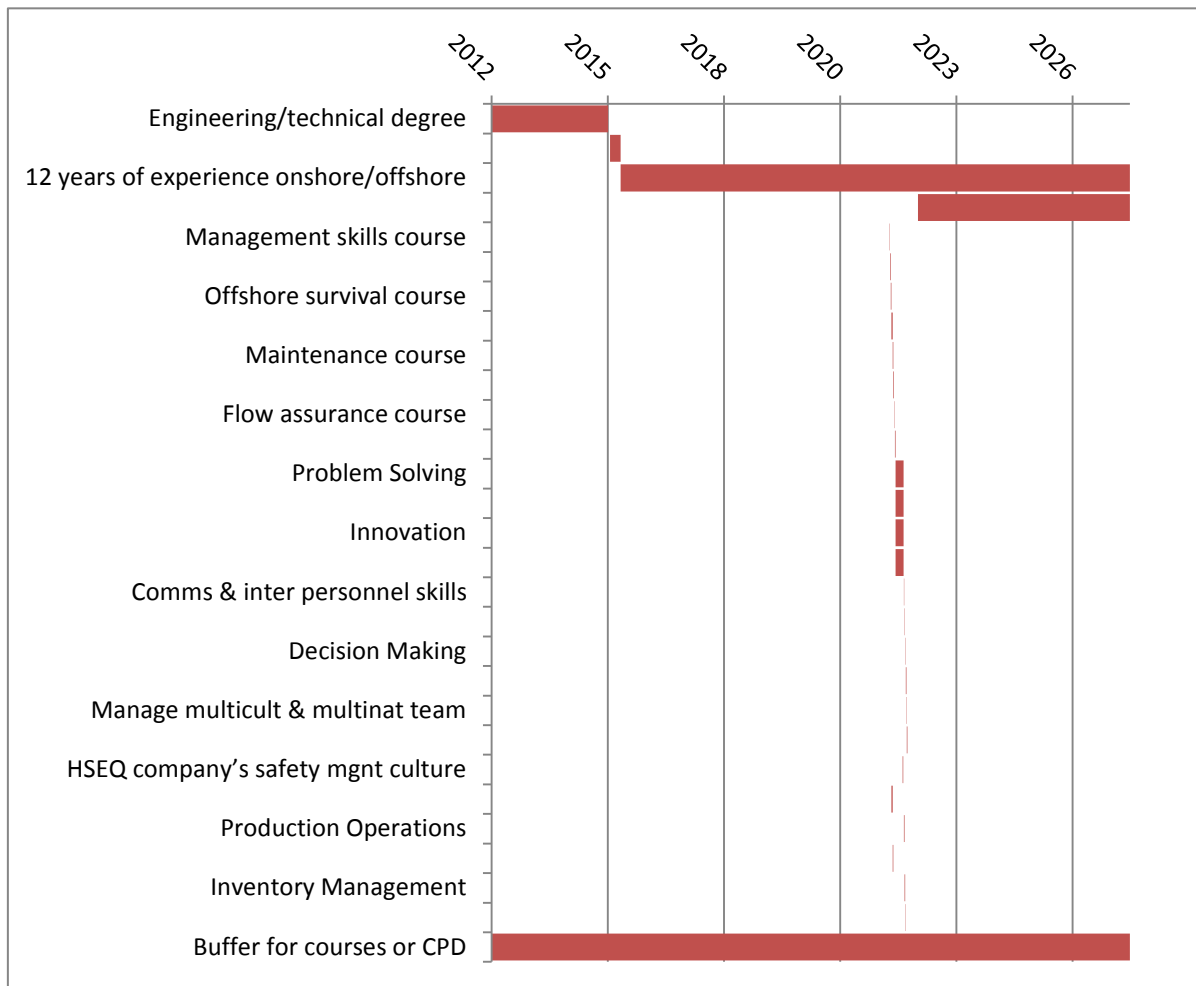
5.4.1 Training and development investment timelines

The different job role timelines and particular NPV calculations are included below. Full breakdowns of the costs are included in Appendices D.1 and D.2 respectively.

Role 1: FPSO Company Rep Manager

The FPSO Company Rep Manager role would require a 15 year training and development programme including a three year degree and 12 years of experience, as shown in Timeline 1. The programme would have needed to begin in 2012, five years prior to commencement of the OCTP operations phase

in 2017 for two local people to be ready for employment as FPSO Company Rep Manager in time for the 90% localisation target set for 2027.



Timeline 1: FPSO Company Rep Manager investment timeline

There would be a requirement for two people working back-to-back, so the calculations are based on two local people completing the development programme.

In the modelling no salary costs were included during the university degree. There was an assumption that a scholarship, accommodation and additional costs associated with the degree training would be provided by Eni Ghana for two Ghanaians; followed by a three month intensive English language course in Ghana including accommodation and costs. The individuals would then be

employed for seven years in Ghana with annual total remunerations of \$42,250 USD per person per annum. This would be followed by five years employment abroad with annual total remunerations of \$106,279 USD per person per annum. During that employment, there would be 20 national and international training courses to meet the required competencies, costing approximately \$101,817 USD per person. During the first ten years of OCTP's operations, the two expatriates would work back-to-back, costing approximately \$240,010 USD per expatriate per annum. Additionally a buffer of \$10,000 USD per person per annum was included in the 15 year development programme for additional unknown costs. From 2027, the two Ghanaians would replace the expatriates as FPSO Company Rep Managers with estimated remuneration of \$106,279 USD per person per annum. They would stay in their position for seven years until 2033, at the end of the operations phase.

As the two local people would be employed by Eni Ghana, a 13.04% discount rate was used in NPV calculations, which was the WACC of O&G in Ghana for 2017 (Damodaran, 2017a). The expatriates employed for ten years would be employed by Eni in Italy, so a 7.76% discount rate was used in the NPV calculation too, which was the WACC of O&G in Italy for 2017 (Damodaran, 2017b). This equates to an NPV of -\$2,365,909 USD for two Ghanaians, as shown in Table 37.

In comparison employing two expatriates for the full 17 years operations phase would require employment by Eni in Italy, using a 7.76% discount rate. This equates to an NPV of -\$4,794,834 USD for two expatriates, as shown in Table 37. This is 2.03 times the cost of employing two local people.

Assuming a 0% discount rate, the local development programme would cost -\$8,484,008 USD, whereas employing two expatriates would cost -\$8,160,340 USD, as shown in Table 37. This represents a 0.36% discount rate between the cost of developing two local people compared to employing two expatriates.

Table 37: NPVs for two FPSO Company Rep Managers

Discount rate in NPV calculation	Local development programme (USD)	Expatriate (USD)
0%	-\$8,484,008	-\$8,160,340
7.76%	-	-\$4,794,834
13.04% including 7.76% for expatriates	-\$2,365,909	-
0.36%	-\$8,158,441	-

Role 2: Exploration Manager

The Exploration Manager role would require a 13 year training and development programme including a three year degree and 10 years of experience, as shown in Timeline 2. The programme would have needed to begin in 2014, three years prior to commencement of operations for one local person to be ready for employment as Exploration Manager in time for the 90% localisation target set for 2027. Only one Exploration Manager would be required.



Timeline 2: Exploration Manager investment timeline

No salary would be included during the degree but assumes a scholarship, accommodation and extra costs would be provided by Eni Ghana for one Ghanaian. This would be followed by a three month intensive English language course in Ghana including accommodation and costs. This would be followed by five years employment in Ghana with annual total remunerations of \$42,250 USD per annum and five years employment abroad with annual total remunerations of \$106,279 USD per annum. During that employment there would be 23 national and international training courses to meet the required competencies, costing approximately \$124,797 USD. Additionally a buffer of \$10,000 USD per annum was included in the 13 year development programme for additional unknown costs. During the first ten years of OCTP's operations an expatriate would be required to work as Exploration Manager costing approximately \$301,538 USD per annum. From 2027 the Ghanaian would replace the expatriate as Exploration Manager with estimated remuneration of \$106,279 USD per annum. The Ghanaian would stay in position for seven years until 2033, at the end of the operations phase.

As the local person would be employed by Eni Ghana, a 13.04% discount rate was used in NPV calculations. The expatriate employed for ten years would be employed by Eni in Italy, so a 7.76% discount rate was used in the NPV calculation too. This equates to an NPV of -\$1,653,408 USD, as shown in Table 38.

Comparably, employing an expatriate for the full 17 years of the operations phase would require employment by Eni in Italy, using a 7.76% discount rate. This equates to an NPV of -\$3,012,004 USD, as shown in Table 38. This is 1.82 times the cost of employing a local person.

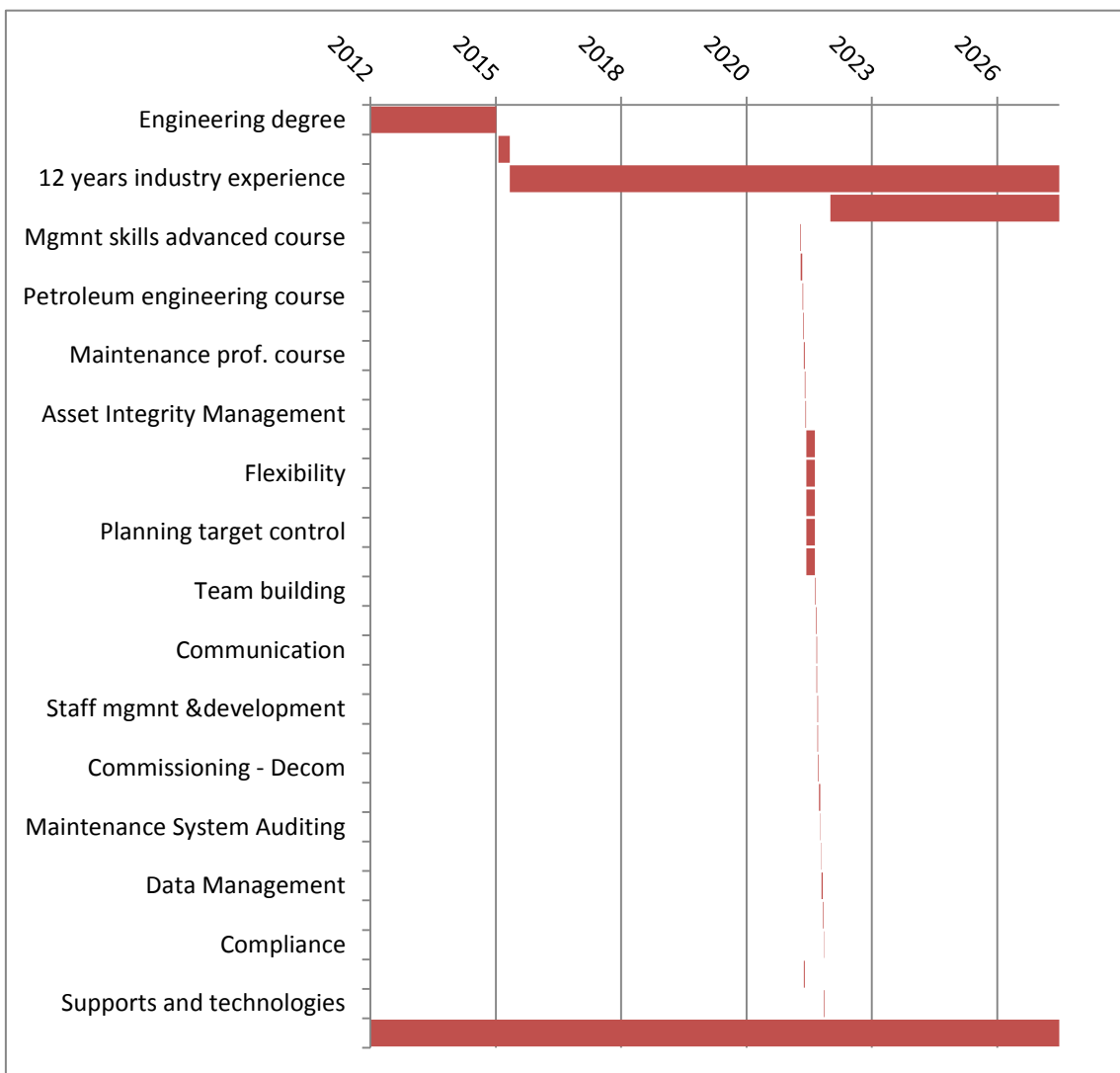
Assuming a 0% discount rate, the local development programme would cost -\$4,777,135 USD, whereas employing an expatriate would cost -\$5,126,138 USD, as shown in Table 38. This represents a 0.90% discount rate between the cost of employing an expatriate compared to developing a local.

Table 38: NPVs for Exploration Manager

Discount rate in NPV calculation	Local development programme (USD)	Expatriate (USD)
0%	-\$4,777,135	-\$5,126,138
7.76%	-	-\$3,012,004
13.04% including 7.76% for expatriate	-\$1,653,408	-
0.90%	-	-\$4,776,163

Role 3: Production and Maintenance Manager

The Production and Maintenance Manager role would require a 15 year training and development programme including a three year degree and 12 years of experience, as shown in Timeline 3. The programme would have needed to begin in 2012, five years prior to commencement of operations for one local person to be ready for employment as Production and Maintenance Manager in time for the 90% localisation target set for 2027. Only one Production and Maintenance Manager would be required.



Timeline 3: Production and Maintenance Manager investment timeline

The training and development programme would include a three year degree and three month language course, replicating the Exploration Manager role. This would be followed by seven years employment in Ghana with annual total remunerations of \$42,250 USD per annum and five years employment abroad with annual total remunerations of \$106,279 USD per annum. During that employment there would be 20 national and international training courses to meet the required competencies, costing approximately \$96,897 USD. Additionally a buffer of \$10,000 USD per annum was included for the 15 years. An expatriate would work for the first ten years, costing approximately \$301,538 USD per annum. From 2027 the Ghanaian would replace the expatriate for seven years until the end of operations in 2033 with estimated remuneration of \$106,279 USD per annum.

The local person would be employed by Eni Ghana, so a discount rate of 13.04% was used. The expatriate would be employed by Eni in Italy, so a discount rate of 7.76% was used. This equates to an NPV of -\$1,362,315 USD, as shown in Table 39.

Comparably, employing an expatriate for the full 17 years would require employment by Eni in Italy, using a 7.76% discount rate. This equates to an NPV of -\$3,012,004 USD, as shown in Table 39. This is 2.21 times the cost of employing a local person.

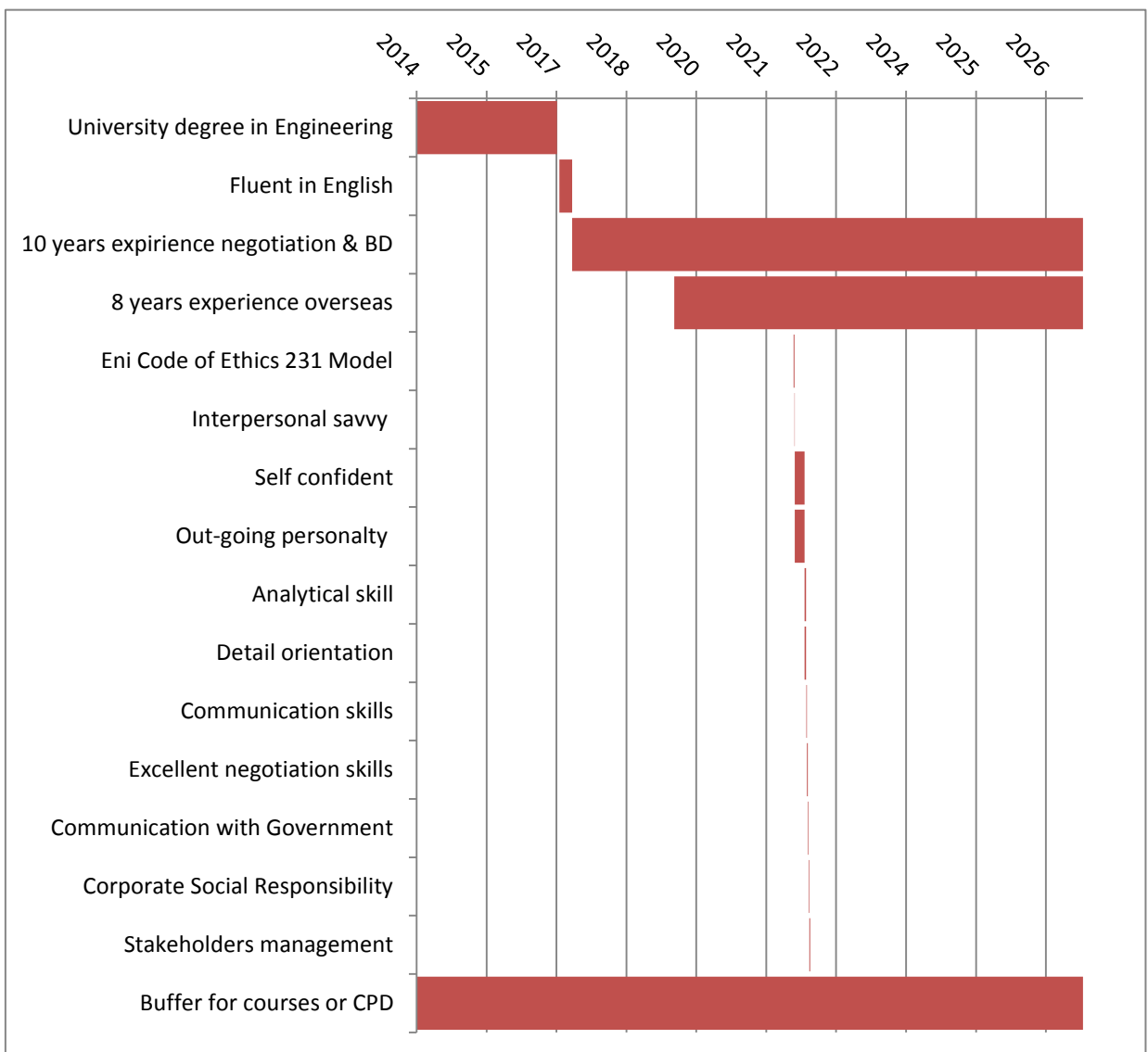
Assuming a 0% discount rate, the local development programme would cost -\$4,852,359 USD, whereas employing an expatriate would cost -\$5,126,138 USD, as shown in Table 39. This represents a 0.69% discount rate between the cost of employing an expatriate compared to developing a local.

Table 39: NPVs for Production and Maintenance Manager

Discount rate in NPV calculation	Local development programme (USD)	Expatriate (USD)
0%	-\$4,852,359	-\$5,126,138
7.76%	-	-\$3,012,004
13.04% including 7.76% for expatriate	-\$1,362,315	-
0.69%	-	-\$4,421,791

Role 4: Negotiations and Business Development Manager

The Negotiations and Business Development Manager role would require a 13 year training and development programme including a three year degree and 10 years of experience, as shown in Timeline 4. The programme would have needed to begin in 2014, three years prior to commencement of operations for one local to be ready for employment as Negotiations and Business Development Manager in time for the 90% localisation target set for 2027. Only one Negotiations and Business Development Manager would be required.



Timeline 4: Negotiations and Business Development Manager investment timeline

This includes a three year degree and three month language course replicating the Exploration manager role. This would be followed by two years employment in Ghana with annual total remunerations of \$42,250 USD per annum and eight years employment abroad with annual total remunerations of \$106,279 USD per annum. During that employment there would be nine national and international training courses to meet the required competencies, costing approximately \$35,505 USD. Additionally a buffer of \$10,000 USD per annum was included for 13 years. An expatriate would work for the first ten years, costing approximately \$301,538 USD per annum. From 2027 the Ghanaian would replace the expatriate for seven years until the end of operations in 2033 with estimated remuneration of \$106,279 USD per annum.

The local person would be employed by Eni Ghana, so a discount rate of 13.04% was used. The expatriate would be employed by Eni in Italy, so a discount rate of 7.76% was used. This equates to an NPV of -\$1,708,057 USD, as shown in Table 40.

Comparably, employing an expatriate for 17 years would require employment by Eni in Italy, using a 7.76% discount rate. This equates to an NPV of -\$3,012,004 USD, as shown in Table 40. This is 1.76 times the cost of employing a local person.

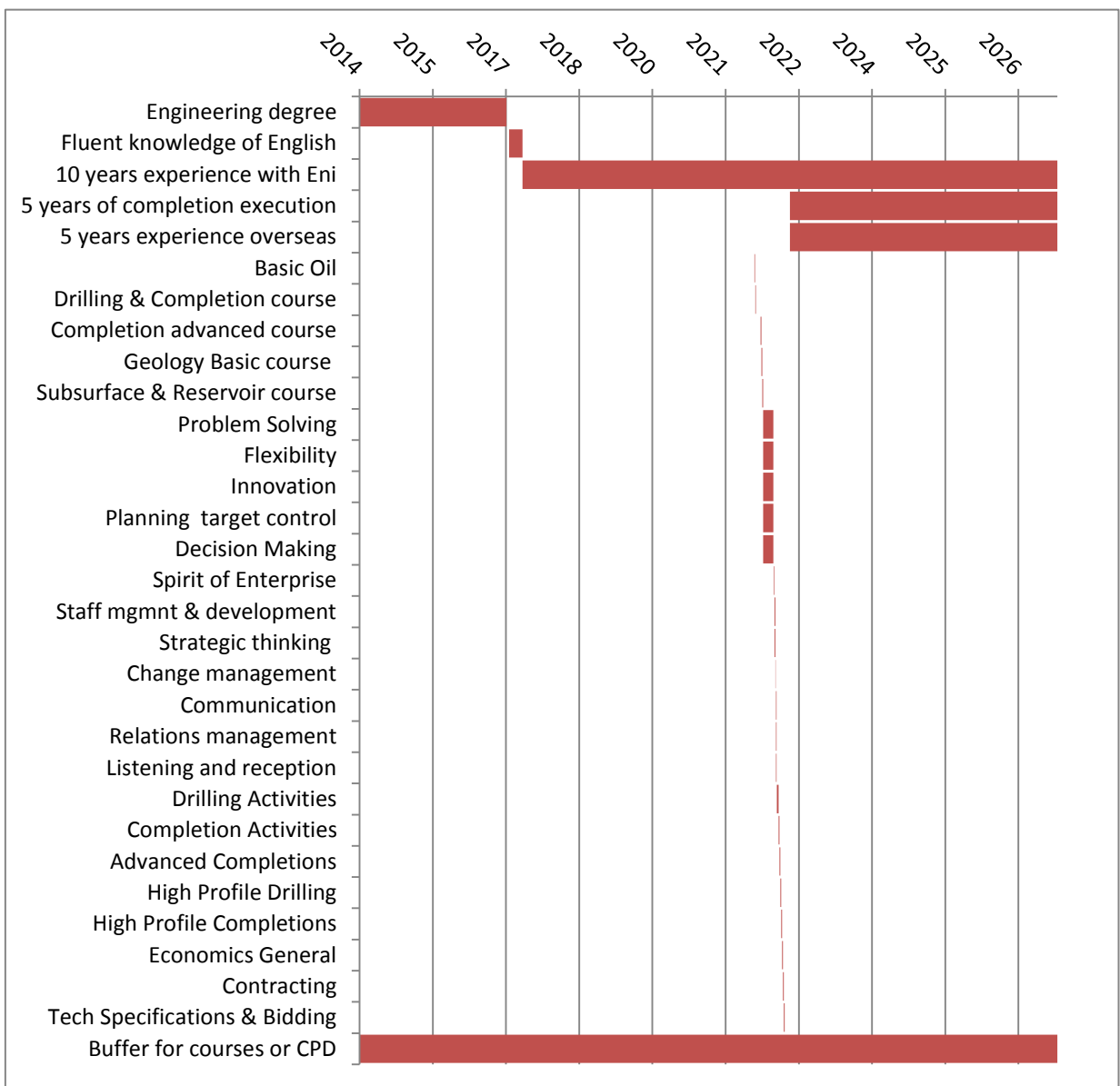
Assuming a 0% discount rate, the local development programme would cost -\$4,882,454 USD, whereas employing an expatriate would cost -\$5,126,138 USD, as shown in Table 40. This represents a 0.62% discount rate between the cost of employing an expatriate compared to developing a local.

Table 40: NPVs for Negotiations and Business Development Manager

Discount rate in NPV calculation	Local development programme (USD)	Expatriate (USD)
0%	-\$4,882,454	-\$5,126,138
7.76%	-	-\$3,012,004
13.04% including 7.76% for expatriate	-\$1,708,057	-
0.62%	-	-\$4,881,454

Role 5: Well Operations Manager

The Well Operations Manager role would require a 13 year training and development programme including a three year degree and 10 years of experience, as shown in Timeline 5. The programme would have needed to begin in 2014, three years prior to commencement of operations for one local person to be ready for employment as Well Operations Manager in time for the 90% localisation target set for 2027. Only one Well Operations Manager would be required.



Timeline 5: Well Operations Manager investment timeline

This would require a three year degree and three month language course replicating the Exploration manager role. This would be followed by five years employment in Ghana with annual total remunerations of \$42,250 USD per annum and five years employment abroad with annual total remunerations of \$106,279 USD per annum. During that employment there would be 18 national and international training courses to meet the required competencies, costing approximately \$99,634 USD. Additionally a buffer of \$10,000 USD per annum was included per annum for 13 years development programme for additional unknown costs. An expatriate would work for the first ten years, costing approximately \$301,538 USD per annum. From 2027 the Ghanaian would replace the expatriate for seven years.

The local person would be employed by Eni Ghana, so a discount rate of 13.04% was used. The expatriate would be employed by Eni in Italy, so a discount rate of 7.76% was used. This equates to an NPV of -\$1,642,870 USD, as shown in Table 41.

Comparably, employing an expatriate for 17 years would require employment by Eni in Italy, using a 7.76% discount rate. This equates to an NPV of -\$3,012,004 USD, as shown in Table 41. This is 1.83 times the cost of employing a local person.

Assuming a 0% discount rate, the local development programme would cost -\$4,750,286 USD, whereas employing an expatriate would cost -\$5,126,138 USD, as shown in Table 41. This represents a 0.97% discount rate between the cost of employing an expatriate compared to developing a local.

Table 41: NPVs for Well Operations Manager

Discount rate in NPV calculation	Local development programme (USD)	Expatriate (USD)
0%	\$-4,750,286	-\$5,126,138
7.76%	-	-\$3,012,004
13.04% including 7.76% for expatriate	\$-1,642,870	-
0.97%	-	-\$4,750,474

5.4.2 Overview of NPV calculations using WACC discount rates

For all five job roles the NPV calculations using WACC discount rates in Ghana and Italy suggest that it is more cost effective to localise than to employ an expatriate, as summarised in Table 42.

Table 42: Summary of NPV calculations using 2017 Ghanaian and Italian WACC oil and gas sector discount rates

Job role	Local development programme (USD)	Expatriate (USD)	Outcome
FPSO Company Rep Manager X2	-\$2,365,909	-\$4,794,834	Localisation reduces costs
Exploration Manager	-\$1,653,408	-\$3,012,004	Localisation reduces costs
Production and Maintenance Manager	-\$1,362,315	-\$3,012,004	Localisation reduces costs
Negotiations and Business Development Manager	-\$1,708,057	-\$3,012,004	Localisation reduces costs
Well Operations Manager	\$-1,642,870	-\$3,012,004	Localisation reduces costs

5.4.3 Overview of NPV calculations using 0% discount rates

However, when applying a 0% NPV calculation, representing absolute costs, it is less cost effective to localise the FPSO Company Rep Manager role than to employ expatriates. For all four other roles it is still more cost effective to localise than to employ an expatriate, as summarised in Table 43.

Table 43: Summary of 0% NPV calculations

Job role	Local development programme (USD)	Expatriate (USD)	Outcome
FPSO Company Rep Manager X2	-\$8,484,008	-\$8,160,340	Localisation is more costly
Exploration Manager	-\$4,777,135	-\$5,126,138	Localisation reduces costs
Production and Maintenance Manager	-\$4,852,359	-\$5,126,138	Localisation reduces costs
Negotiations and Business Development Manager	-\$4,882,454	-\$5,126,138	Localisation reduces costs
Well Operations Manager	\$-4,750,286	-\$5,126,138	Localisation reduces costs

6 Discussion

This study used a case study of one O&G company operating in Ghana to investigate whether JRL is viable and can reduce costs for O&G companies. Using a survey the study has investigated whether different stakeholders' opinions differ about local content issues at a global level. Then it used semi-structured interviews and a group interview in Ghana to uncover national context factors that affect JRL. This was followed by testing a decision tree methodology as a way of evaluating JRL viability of one O&G company operating in Ghana. Finally training and development investment timelines were modelled to assess whether the costs of employing expatriates were greater than training, developing and employing Ghanaians to do the same job roles.

This chapter includes a discussion of the results in the context of existing literature. A hypothetico-deductive description of each hypothesis is followed by an interpretation of the integrated results that form recommendations for implementation.

6.1 Discussion - hypothesis one

Hypothesis one focused on the global level. It sought to investigate whether opinions about local content and localisation issues differ between O&G companies, education institutions, training/consulting companies and governments. The objective was to identify differences and similarities of opinions amongst stakeholders in the O&G industry.

The hypothesis was rejected as there were fewer differences than similarities.

6.1.1 Implications of the results

Only four of the 19 questions had statistically significant differences in responses between the different categories of organisation. However despite different backgrounds many held the same views, therefore it is possible to make generalisations based on the mode responses for the entire sample and for each of the different organisation types. The differences and similarities offer some insight into the implications of implementing JRL.

Generally it was considered that the word 'local' within local content and localisation referred to the national scale. This is in line with Nwapi's (2015) findings that local content most often refers to the national scale, without specifically focusing on localities closest to O&G operations. Local therefore predominantly refers to individuals from a country and not a particular affected community. This explains the background behind different interpretations of the meaning of 'local' raised in chapter 2.2.

Overall, respondents from the entire sample most frequently answered that the economic benefit of O&G is often not evenly distributed across a country. However, there were statistically significant differences between the groups. Figure 12 shows that respondents from training/consulting organisations were more likely to respond that the economic benefits are not equally distributed compared to respondents from O&G companies. Existing theory suggests that O&G activities should create backwards, forwards and horizontal linkages to support cross-sector and national benefit (Ayentimi et al., 2016; Hansen, 2014; Tordo et al., 2013). Institutional strength, local content policy efficacy and effective long-term hydrocarbon wealth management strategies have been attributed to a country's ability to distribute the benefits of O&G national (García-Rodríguez, García-Rodríguez, Castilla-Gutiérrez, & Major, 2015; Kim et al., 2017; Lewin, 2011).

Overall, respondents from the entire sample answered that national and local governments' development strategies are not aligned. However, there were statistically significant differences between the groups. Figure 11 shows that respondents from training/consulting organisations were most likely to respond that national and local governments' development strategies are not aligned compared to respondents from other organisation categories. Marcel et al. (2016, p.6) have recommended that local content policies should be underpinned by a national strategy, with "coordination between national government ministries [and] local governments" but the results would suggest this is not happening. Without this there is a risk of "conflicting regulations,

increased administrative costs, delays in project execution and...rent-seeking behaviour and corrupt practices” (Tordo et al., 2013, p. 155).

Overall, respondents from the entire sample most frequently answered that not all job roles should be localised. However, there were statistically significant differences between the groups. Figure 10 shows that respondents from training/consulting organisations were more likely to reply that all job roles should be localised, which particularly differed from respondents from O&G companies. Within the literature, it is largely agreed that companies should “employ and train local staff [to] gradually replace expatriates with locals” (IPIECA, 2016, p. 53). However there are multiple reasons why companies should not and cannot localise all job roles. Reasons for which range from a shortage of people with the required qualifications, training and experience within the local labour market and because companies benefit from expatriates sharing their knowledge with local workers and for their understanding of parent company corporate culture and strategy (Bhanugopan & Fish, 2007; Hailey & Harry, 2008; Lam & Yeung, 2010; Selmer, 2004).

Overall respondents from the entire sample most frequently responded that investing early in local education institutions ensures that local people are trained to industry standards. However, there were statistically significant differences between the groups. Figure 13 shows that respondents from education institutions were more likely to reply that they strongly agreed that investing early in local education institutions ensures local people are trained to industry standards compared with respondents from O&G companies. Several existing studies have reported how education investments and capacity building initiatives as a result of O&G activities have advanced local education system capacity and local workforce capability (Davis, 1995; Sigam & Garcia, 2012; Stijns, 2006). Two exemplary case studies of successful O&G investments in local education systems to advance the domestic workforce exist in Libya and Trinidad and Tobago (Andrews & Playfoot, 2015; Playfoot et al., 2014).

Although not statistically significant differences, seven of the 19 questions had differences in mode responses depending on organisation type. This suggests

that there were some additional differences in opinions. For example O&G companies and training/consulting companies felt more strongly than government or universities that expatriates are paid more than local people. As Bhanugopan & Fish (2007, p. 376) suggested “expatriates continue to enjoy lucrative contracts and salary packages worth 60-80 per cent more than locals who do the same job”. However Table 13 shows that this is not necessarily the case in all settings. Existing studies from the Middle East found that local people are often paid significantly more than expatriates (Forstenlechner, 2009). Parity in salaries is important for local people as this can otherwise cause conflict, as shown by Ghanaian protests in Table 5 and reported in several studies (Hailey, 1996; Li & Wang, 2010; Swailes et al., 2012).

A high proportion of respondents felt that the greatest expectation amongst local people from O&G activities is employment, in particular respondents from education institutions. It is widely agreed that “local populations normally have high expectations regarding employment, even if these are unrealistic” (Mtegha & Toigo, 2015, p. 20). Furthermore, that it is the responsibility of governments and industry to manage expectations of job opportunities (CCSI, 2016; Marcel et al., 2016; OECD, 2016; Plänitz & Kuzu, 2015; Senoo & Armah, 2015). There was agreement across the respondents that government and industry should improve their dissemination of information about local opportunities, as described in previous literature (IPIECA, 2016; Warner, 2011).

A large proportion of respondents believed that governments and industry are becoming increasingly aware of the need and merits of building a capable local workforce. Additionally the majority of respondents believed that developing the local workforce is a joint responsibility of both government and O&G companies. Therefore, governments and O&G companies should collectively assess the existing capacity of the local workforce and education system against the needs of future industry skills profiles based on different project phases and “foster alignment between government plans and industry needs” (OECD, 2016, p. 13). This can lead to “front-end loaded skills development” which means the future workforce applicants are prepared in line with industry needs (Marcel et al.,

2016, p. 14). Respondents commonly felt that greater collaboration between different O&G companies and between different governments would be an opportunity for local workforce development.

Respondents commonly agreed that education institutions are frequently not aligned with the needs of industry. This has led to inappropriate curriculum design, and an undersupply of capable local people to meet the needs of industry, an issue which is frequently highlighted as a barrier to JRL (Morris et al., 2012; Senoo & Armah, 2015; Sigam & Garcia, 2012). Despite this misalignment, respondents generally agreed that education capacity building is more cost effective than international education and training scholarships. Interestingly, training/consulting organisations felt most strongly about this. One such successful cost-effective capacity building programme between government, industry and education exists in Brazil (Kayizzi-Mugerwa & Anyanwu, 2015). Furthermore it has been suggested by Playfoot, Andrews, & Augustus' (2014, p. xvi) that "foreign study can undermine the national education system... so capacity development in universities and colleges is an essential aspect of supporting sustainable economic development in hydrocarbon-rich countries".

Surprisingly, government respondents most frequently felt that percentage based local content targets do not benefit local employment. This perhaps suggests that alternative methodologies to measure and monitor local content are more effective, such as those outlined by Tordo et al. (2013). Respondents across other categories of organisation remained uncertain.

6.1.2 Strengths and limitations

The survey was successful with a very high return rate. This rate of return was achieved as a result of the researcher's persistence in following up with individuals multiple times and due to the interest of the respondents in the subject area.

However there were a number of issues associated with the questionnaire. The sample size was small with just 204 usable responses and two under-

represented categories were removed. A larger sample size would have given greater results, which would have improved the reliability of the results. The results favoured the opinions of oil companies and training/consulting organisations, as these organisations were most represented. A fairer distribution would have increased validity. Whilst the Cronbach's score suggested the questionnaire was reliable, the score was relatively low. A higher score would have meant that the results were more reliable.

The responses to the Likert data meant that only non-probability tests could be used, whereas probability test would have been stronger. Other tests, such as Pearson's chi-square test were applied to questions to test for associations, although due to low sample size it was necessary to use Fishers exact tests. As there were no statistically significant results, they were not included in the results section.

Although the questionnaire was designed not to request demographic information, this did limit further testing of the data. There was no way to define which region or country the respondent was from. For example this would have been interesting to differentiate whether respondents from the Middle East responded differently to other regions about whether expatriates are paid more than local people. The analysis was limited to just focus on types of organisations.

The researcher took care to minimise bias during the purposive sampling method, despite various risks of bias (Creswell & Plano Clark, 2007). Only senior representatives were selected by the researcher and a maximum of two people from the same organisation participated in the survey to reduce the risks of bias. Inevitably some degree of researcher bias may have played a part in the sample selection. There is risk that respondents may not have answered entirely truthfully, however this was avoided by promising anonymity. Non-response bias was plausible however non-responders did not have time, didn't feel they had sufficient experience or did not have permission to respond. Social desirability bias was avoided through the promise of anonymity and phrasing of

questions. Consideration was given to avoid wording, leading question and question-order biases, through the pilot study.

During the coding in the qualitative data, there was inevitably some researcher bias towards outcomes. Using factor analysis as an alternative could have led to more reliable choices in common opinions, experiences and recommendations. Due to the limitations of space within this study, it was not possible to include detailed results from the open-ended questions within the questionnaire despite having valuable insights.

6.1.3 Summary

The hypothesis that different stakeholders respond differently was disproven, therefore the hypothesis was rejected. There were many areas in which all organisation types responded in a common way, enabling generalisations to be made.

The results suggest that different stakeholders within the O&G sector more commonly agree about local content and localisation issues than they disagree. There were some differences of opinion, notably about whether all job roles should be localised, the alignment of national and local governments, whether socio-economic benefits of O&G are evenly distributed nationally and whether early investment in local education institutions ensures local people are trained to industry standards.

One qualitative response in the questionnaire said “each project location is different; each country is different, what works in one place will often not work in another”. As such, it is necessary to focus on the specifics of one country, in this case Ghana.

6.2 Discussion - hypothesis two

Hypothesis two sought to determine whether national context specific factors affect JRL. This was achieved using semi-structured interviews and a group interview in Ghana to determine Ghanaian specific factors impacting JRL. Ghana was chosen as it is an example of a country where JRL is currently a major priority within the O&G sector.

The second hypothesis was accepted, as there were many factors that affect JRL specific to the Ghanaian context. The results suggest that context specific factors must be considered when developing JRL strategies.

6.2.1 Implications of the results

The results were characterized into 80 Ghanaian specific factors, which were grouped into 14 broad themes, and four overarching categories of government, labour market, industry and multi-stakeholder. These factors provided an in depth illustration of the quantitative data from the questionnaire in Hypothesis one.

Government of Ghana

Collier & Goderis (2008) suggested that institutional strength, quality and transparency are necessary to avoid resource curse symptoms. Interviewees described that the new Ghanaian Government is pro-business and that good communication and differentiation between government agencies suggests that Ghana has robust institutional strength. However, the Government has a different strategy from the previous government, which has caused delays and uncertainty in decision making. This was exemplified by the new board within the Petroleum Commission. In spite of this, interviewees described communication and differentiation between government agencies has led to good institutional strength.

The Petroleum Commission oversees and monitors all operating companies' localisation timelines, training and succession plans on a monthly and annual basis. However concern was raised by interviewees over the Petroleum

Commission's understanding of the specific needs of particular job roles. The risks include putting the wrong local people into jobs and the Petroleum Commission declining expatriate work permits. As Fayol-Song (2013) and Toumasi (1990, as cited in Bhanugopan & Fish, 2007) recognised, pressure from government in succession targets can lead to promoting incompetent employees early. As a result, O&G companies face a major challenge to fit within the legal requirements of 90% localisation within ten years of operation, a target which concerns O&G companies (Arthur & Arthur, 2014).

It was recommended within the interviews that there is a need for increasing the local capacity of the government, education system and workforce in Ghana to meet the growing needs of the sector. This supports Amoako-Tuffour et al.'s (2015) findings that there is a need for government capacity building in Ghana.

Ghanaian Labour Market

In Ghana, interviewees said that the principal barrier to employing local people is the lack of experienced people within the labour market. Bhanugopan & Fish (2007) also found that although local people may have the required education, they do not have the experience required to be hired in traditionally expatriate job roles. Marcel et al. (2016) stated how this is a common problem in new hydrocarbon producing countries. Interviewees explained that accessing offshore experience for technical staff is a challenge in Ghana. As such companies need to be prepared to review and reduce their experience requirements to meet localisation targets. O&G companies in Ghana have been forced to bring in expatriates to do job roles where there is a gap, despite pressure from the Petroleum Commission. Many JRL studies have discussed the merits of employing expatriates in addition to local workers (Kobrin, 1988; Randeree, 2009; Selmer, 2004).

Interviewees raised that appropriate skills, experience and competency development takes time and cannot be rushed. To improve the workforce, there is a need for mentorship, coaching and improved public education. In order to increase experience companies have sent Ghanaian employees overseas for training and development. Competition is high for senior level expertise in

Ghana's O&G sector (Ahwireng, 2016). One solution raised in the interviews was to consider accessing transferrable skills of Ghanaians working in Ghana's longstanding mining sector (Oppong, 2015). Amongst senior local managers there are often significant negotiations to ensure that they receive the best deal.

Cooke, Wood, & Horwitz's (2015, p. 2660) found that "those with skills and education are often forced to seek employment abroad owing to the dearth of options domestically". Finding top talent locally is a challenge when talent migrates internationally causing a brain drain locally (Horwitz, 2013; Knight, 2008; Macready & Tucker, 2011). Interviewees suggested a solution was to incentivise the Ghanaian diaspora to return. However, despite being passionate about returning to Ghana, accessing the diaspora is a challenge because companies refuse to pay international Ghanaians an international salary.

There was a belief amongst interviewees that the Ghanaian Government could do more to prepare Ghanaians for industry – particularly for those with less education, youth and women (Adusah-Karikari, 2015; Obeng-Odoom, 2015). There are roles that have transferrable skills such as project management which should be easier to fill than highly technical roles. Youth unemployment is an issue with a particular need for young Ghanaians going through National Service to be provided appropriate work assignments by industry (Panford, 2014b). There are very few women in Ghana's O&G sector. This was described as a cultural issue, as women are not expected to have technical careers.

It was commonly agreed that there are a large number of education institutions in Ghana focused on O&G related courses. Whilst education levels are of a relatively high standard, there is a gap in what is being provided within the education system and what is required by industry (Arthur & Arthur, 2014). Standards vary across education institutions and interviewees said that curricula were frequently irrelevant. This is exacerbated by relatively limited links between industry and education, despite a number of industry sources discussing their inputs in curriculum, scholarship provisions and other initiatives. In other setting the education system is reported to be often misaligned with

industry needs (Senoo & Armah, 2015; Sigam & Garcia, 2012; Swailes et al., 2012).

Education is largely theoretical and not practical, with limited focus on Health, Safety and Environment (HSE). This is worsened by laboratories generally lacking up to date equipment, despite investments from organisations such as the World Bank. Additionally the stigma attached to vocational jobs means there is limited desire to attend polytechnics and colleges. However initiatives in Ghana such as the Jubilee Technical Training Centre (JTTC) at Takoradi Technical University and Field Ready, which is a programme focused on developing local people with the required skills to be employable within the O&G sector, were discussed as successful education and training initiatives in vocational education for the O&G sector. Academics have described biases against technical and vocational learning in countries across Africa, creating an uneven skills base (Ellis, Nyuur, & Debrah, 2015; Gomes, Sahadev, Glaister, & Demirbag, 2015) and often public training institutions do not have adequate funding, facilities, laboratories or learning materials (Kiggundu, 1991).

A number of common traits of the Ghanaian workforce were expressed. Interviewees said that Ghanaians tended to be very respectful of those they consider to be senior in age or rank. Ghanaians were described as very positive, polite, committed, entrepreneurial and business minded who take pride in their work. Ghanaians were described as humble and deferential. However they dislike confrontation, discussing failure, complications or errors. Additionally, Ghanaians are unlikely to decline requests made of them to avoid embarrassment, even if the request was inappropriate. Ghanaians can be perceived as not taking initiative and expect to be given tasks by their management. Additionally it was raised that amongst Ghanaians safety culture and issues of poor time management can be a risk for the O&G industry. These characteristics are consistent with Aryee's (2004) assessment of Ghanaians as a collectivist society, that have strong bonds and obligations to a group identity in kinship to an extended family, whilst emphasising the importance of status differences.

In the interviews communication skills were raised. Interviewees said that Ghanaians do not always listen to each other, but instead speak over each other. As the O&G industry deals with multiple cultures, Ghanaians generally need to be aware of different cultures too.

Industry

Interviewees raised the difference in salaries between expatriates and Ghanaian nationals as a major issue, with several interviewees referring to protests included within Table 5 in chapter 2.3.6. Ghanaians were generally described as having a negative perception of expatriates who are seen as taking money away from Ghana back to their home country, as reported in other JRL studies (Hailey, 1996; Li & Wang, 2010; Swailes et al., 2012). Despite this, interviewees explained that within the O&G sector it is generally understood by Ghanaians that expatriates are required when no local person is available with the skillset required for highly technical roles.

International companies in Ghana are perceived as being most comfortable employing expatriates. However, expatriates are viewed as disliking localisation, as it requires them to train Ghanaians and to lose their job at the end of the succession period (Hailey & Harry, 2008; Selmer, 2004). Briscoe & Schuler (2004) described how such issues can lead to expatriate failure and disputes.

It was widely discussed that there are very limited job opportunities in Ghana's O&G sector, as is commonplace within the O&G industry (Amundsen, 2013; Ovadia, 2012; Wise & Shtylla, 2007). Additionally, standards of Ghanaian suppliers and workers often do not meet industry's international expectations, previously reported by Ablo (2015). Within the literature, it has been widely reported that O&G company standards can be a barrier to local content (Warner, 2011; Wilson & Kuszewski, 2011).

According to one interviewee, in Ghana "localisation is a political issue, particularly as the O&G industry is not such a big industry; the expectations are incredible". The 'social license to operate' was discussed by many interviewees

as very important; with significant expectations and disappointment amongst locally affected communities of the impact of O&G, as has been found previously (Harvey, 2014; Poruthiyil, 2013; Waskow & Welch, 2005). Notably interviewees acknowledged that there is still disparity in local communities' feeling the benefits of O&G. One example given is Tullow Oil's private jet. This is perceived negatively by local people, as it represents O&G company wealth compared to local people's lack of O&G benefits. Without the 'social license to operate', O&G operations can be affected by conflict with local communities, so is an important issue in JRL (Browne, Stehlik, & Buckley, 2011; Carrington & Pereira, 2011; Nwapi, 2015).

The working culture of Ghana is different to that of Europe. This is significant since the O&G company in this case study, Eni, is an Italian organisation. There is a requirement to adapt to local cultures by the Europeans as doing business in Ghana was described by the interviewees as challenging for outsiders. For example, the interviewees described that the principal method of advertising job roles in Ghana is in local newspapers, also reported by Aryee (2004). As such MNC HR practices must adapt "to local practices and norms" (Ellis et al., 2015, p. 420). In contrast to this, Arthur, Woehr, Strong, & Akande (1995) found that West African HR practices have many similarities to Western HR management. Both recruitment approaches use formal processes and require qualifications, interview, references and background checks.

MNCs often replicate their head office practices which are often unsuitable for their African subsidiaries (Horwitz, 2009; Jackson, 2012; Kamoche, Debrah, Horwitz, & Muuka, 2003). One interviewee said that "there are lots of complexities to the Ghanaian culture of working". As a result O&G companies must adapt their JRL strategies to the social norms, cultural dimensions and local business practices of the 'national culture' (Cunha, Fortes, Gomes, Rego, & Rodrigues, 2016; Hofstede, 1980).

Localisation was described frequently as a sustainable solution, although the LI-2204 legislation is not widely known amongst Ghanaians. One interviewee proposed any job role could be localised with enough investment and time,

whilst several interviewees claimed that costs could be reduced. Localisation must be a core aspect of O&G company strategies, with risks of strict sanctions if they are not met. Furthermore whilst there have been success stories, such as Tullow Oil's promotion of a Ghanaian national to Offshore Installation Manager, there are risks of companies employing or promoting the wrong people too soon.

Recruitment within industry has slowed due to a maritime border dispute which caused a moratorium on drilling activities. Furthermore the oil price had fallen which affected O&G training and recruitment budgets. Both of which have impacted JRL in Ghana.

Multi-stakeholder issues

Generally interviewees agreed that Ghana as a whole needs to benefit from O&G resources and not just the Western Region. Despite this, there has commonly been discontent about the impact of O&G on livelihoods amongst local communities in the Western Region. Notably there have been signs of resource curse and 'Dutch disease' impacts, with housing and food prices increasing, and significant population growth as people come to the Western Region in search of jobs. As has been widely described in literature, whilst it is important that locally affected communities benefit, the whole nation must benefit from O&G (Marcel et al., 2016; Poruthiyil, 2013).

A common issue raised in the interviews was a lack of collaboration and communication between the Government, industry and the education community. This is a necessity for local content to be successful according to many studies (Marcel et al., 2016; Mtegha & Toigo, 2015; OECD, 2016). Notably, O&G companies are not working together on workforce development initiatives; as has been found previously by Sigam & Garcia (2012).

Miscommunication of jobs in Ghana's O&G sector is a significant issue (Plänitz & Kuzu, 2015). Interviewees reported poor communication regarding future job opportunities, with major expectations amongst Ghanaians of immediate and numerous jobs. This has been worsened by the media sensationalising the

industry and raising Ghanaian expectations (Behrman, Canonge, Purcell, & Schiffrin, 2012; Obeng-Odoom, 2015). Local communities in localities close to the O&G operations have had very limited opportunities for jobs due to low skillsets, and this has led to dissatisfaction amongst local chiefs and communities.

Interviewees described issues of trust between different stakeholders. Notably associated with jobs, it was felt that Ghanaian people were perceived as having more a relaxed work ethic than their expatriate counterparts, as reported by Randeree (2009). Ablo & Overå (2015) found that MNCs in Ghana did not trust local organisations. Others have argued the need for expatriates to trust in local staff (Dickmann et al., 2017; Fryxell et al., 2004).

6.2.2 Strengths and limitations

The interviews were successful, with the aid of a flexible interview guide. However there were several limitations.

The interviews were not recorded, but instead the researcher used hand written notes. This undoubtedly resulted in a loss of information. However, by sending the transcripts back to each interviewee, this allowed for changes to be made, and increased the reliability of the material. The representatives selected for the interviewing were a mix of representatives with an interest in O&G in Ghana, which was believed to be a fair representation of key stakeholders across Ghana. Additionally, whilst care was taken to avoid leading questions, several questions may have unintentionally encouraged answers associated with researcher preferences.

The coding methodology used open, axial and selective coding techniques (Strauss & Corbin, 2008). Nvivo software was used to understand key themes and statements. There was a risk of bias during the coding process to focus on those areas of interest to the researcher. Nvivo software was chosen for “recording and linking ideas in many ways, and for searching and exploring the patterns of data and ideas” (Richards, 1999, p. 4). Despite these strengths, Nvivo has been criticised for not address the validity and reliability of themes

within the data (Welsh, 2002). Furthermore, computerisation of qualitative data analysis risks the researcher becoming distanced from their data (Bazeley & Jackson, 2013).

6.2.3 Summary

The interview results presented 80 local context specific factors impact JRL. Many of these factors added depth about the Ghanaian context which adds specificity, validity and reality to the questionnaire results in hypothesis one.

Hypothesis two was accepted; as such there are national context specific factors which do impact JRL, which is in line with previous literature (Cunha et al., 2016; Dickmann et al., 2017; Petison & Johri, 2008).

6.3 Discussion - hypothesis three

Hypothesis three sought to assess the viability of localising particular job roles. This was achieved by using a decision tree methodology on a sample of ten job roles within Eni Ghana.

All ten roles were tested based on the present day scenario of 2017. Then the five expatriate job roles were tested for a scenario ten years after operations commenced for 2027, when Eni Ghana are legislated to achieve 90% localisation.

The decision trees were effective for assessing the viability of localising job roles in Ghana, therefore hypothesis three was accepted.

6.3.1 Implications of the results

The decision trees for all ten job roles in 2017 represented reality, whereby the final decision for the five positions currently held by expatriates was not to localise and for the five positions held by Ghanaians was to localise.

Expatriate roles 2017

All the decision trees for the expatriate roles were short, each with only 12 stages. The common reason for not localising each role was due to a requirement for more than ten years of experience. There were no Ghanaians with sufficient experience available within the labour market to occupy these positions. In each case there was no need to continue down the decision tree process as this was determined as too significant a barrier for localising the role. As is commonly highlighted in JRL literature, “where the multinational firm needs or wants to hire host country nationals, the availability of local nationals with the necessary education and skills often becomes a major problem” (Briscoe & Schuler, 2004, p. 232).

The decision trees largely shared common sub-decisions. All five job roles were permanent and managerial. Within the local content L.I.-2204 legislation in Ghana, there is a minimum of 30% localisation of management roles in Ghana at this stage in the operation phase (Petroleum Commission, 2013). In 2017

there was not significant pressure to localise due to the low percentage of positions taken by expatriates and none of the roles significantly impacts political risk with stakeholders. However, if another organisation had filled that particular role over the same time period, then the Petroleum Commission's expectations to have a Ghanaian in that role would be likely to increase. For example Tullow Oil has employed a Ghanaian as an Offshore Installation Manager within ten years of operations. For all five roles there is a preference within Eni Ghana for an expatriate to occupy the role, as has been found in the literature (O'Donnell, 2000; Oppong, 2015).

These results reflect Cooke, Wood, & Horwitz's (2015) and Amankwah-Amoaha & Debrah's (2011) findings that MNCs across Africa struggle with a shortage of local talent due to market failings, inadequate investment in workforce development and high competition for top talent. Within the O&G industry a shortage of local skills forces companies to use expatriates to sustain operations (Ismail, 2010; Ngoasong, 2014). MNC's use expatriates primarily "for their technical or functional expertise, for control, to start a new operation, and for managerial development purposes" (Briscoe & Schuler, 2004, p. 230).

Local roles 2017

All local roles had 38 stage decision strategies. The five decision trees found that all local job roles could be localised in 2017. As Selmer (2004) recognised the recruitment and retention of local employees is fundamental to localisation being successful.

There were a mix of management roles and technical roles with a combination of competencies, qualifications and requirements for each of the job roles. Ghanaian legislation requires 20% localisation for technical core staff for year one (Petroleum Commission, 2013). All roles were permanent requiring only one person in each and all had insignificant impacts on political risk. Eni Ghana preferred all the roles to be held by local staff. All roles required more than five or ten years of experience and only two required more than 5 years of specialised experience. With the exception of the Reservoir Geologist role, each had transferable skillsets from other sectors, for example accounting, ICT, HSE

or law. Transferable skills provides an opportunity for local people accessing job roles across different sectors, cultures and contexts (Botha, 2010); however it is essential to avoid hiring 'ghost workers', who are employees that only exist on paper, or hiring unqualified nationals just to fulfil quotas (Al-Waqfi & Forstenlechner, 2010).

For all job roles additional training courses were required. Principally this included a month long on-boarding process and an orientation of Eni's corporate culture. Each company has its own culture and previous studies have shown that local people's lack of awareness of that culture can be a barrier to localisation (Lam & Yeung, 2010; Potter, 1989). Eni's investment in an upskilling programme was required and then it was plausible to localise each of the local job roles.

As the skillsets were transferrable for the local job roles, it was believed plausible to find a local person with sufficient experience in each role. Furthermore, the education system had relevant courses for each of the five roles, as such it was deemed feasible to recruit at the required education level of high school through to undergraduate for each role.

The complexity of localising all ten job roles is presented in Figure 14. The job roles in the green and orange boxes can be localised most easily as they require either 'low skill & low experience' (green box) or 'high skill & low experience' or 'low skill & high experience' (orange boxes). In contrast, all five expatriate job roles are in the red box, which requires 'high skill & high experience'.

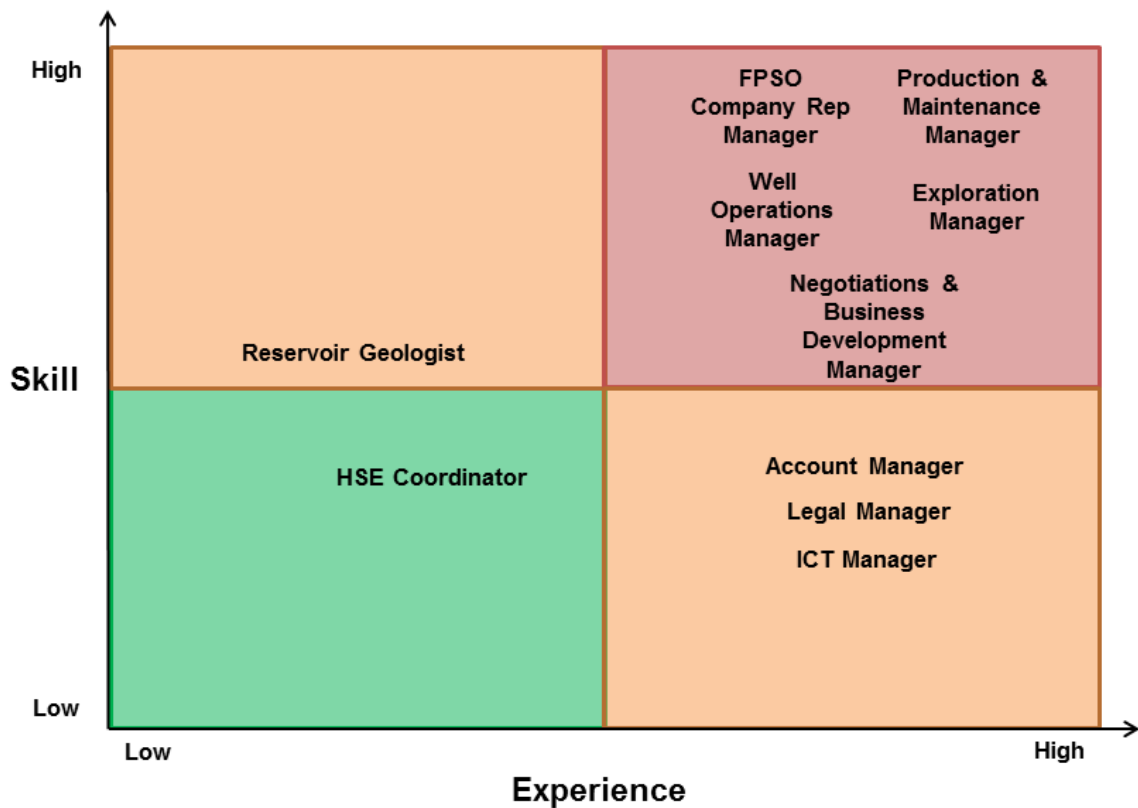


Figure 14: Job roles skill and requirement matrix

Expatriate roles 2027

Eni Ghana is legislated to achieve 90% localisation by 2027 (Petroleum Commission, 2013). The 2017 expatriate decision trees and interviews suggested there are few Ghanaians with the high levels of skill and experience required by O&G companies. The 2027 decision trees mirrored Eni Ghana’s existing succession plans (described in Appendix C.3), which shows how four roles would be localised and one would remain occupied by an expatriate.

The 2027 Exploration Manager decision tree had 12 stages, with the final decision not to localise. In 2027, there is a legislated requirement for 70-80% localisation (Petroleum Commission, 2013). It was anticipated that there would be pressure to localise as Eni Ghana would be reaching 67-100% of its quota for expatriates. Despite this, it was felt that there would not be sufficient political

risk associated with localising this role, and preferably other roles could be localised in order to maintain targets.

The decision tree has shown how there would remain a preference for an expatriate, a requirement for someone with significant experience, knowledge of Eni's internal processes and technical skill. As a result, the role would remain filled by an expatriate. This is in line with the survey respondents responses that not all job roles should be localised (Table 16) and the JRL literature whereby higher skilled positions tend to be taken by expatriates as they are considered too high risk to be localised due to their technical complexity (Bhanugopan & Fish, 2007; Kim et al., 2017; Oppong & Gold, 2016).

All four other job roles would be localised within the 2027 scenario. Each would fall into the 70-80% localisation target. There would be significant pressure to localise all four roles, despite Eni Ghana's continued preference for expatriates. Whilst there would be a Ghanaian available for each role with all required skills and competencies, some further training, coaching and mentoring would be necessary. Eni Ghana does have a succession plan for Ghanaians currently in junior positions to replace expatriates by 2027, therefore addressing the legal requirement to meet their localisation target.

When testing the decision trees for the 2027 scenarios, the results suggested that with time it would be possible to localise job roles. It would however require Eni Ghana to be flexible with experience requirements in order to meet the 2027 localisation quotas set out by the Petroleum Commission in LI-2204. For example the Production & Maintenance Manager job specification states a requirement for more than 12 years industry experience, which in theory means the role couldn't be localised in less than ten years, and some consideration to reducing experience requirements would be needed. It has been questioned within the literature whether O&G companies simply meet local content targets to legitimise their position with government (Henisz et al., 2014; Weldegiorgis et al., 2017). However, interviewees said that the Petroleum Commission has a strict process to monitor JRL. As one interviewee said "if companies do not meet their targets there are sanctions in place". That said, the JRL literature

highlights the risks of companies being forced to hire and promote people too early (Bhanugopan & Fish, 2007; Hailey, 1996; Toumasi, 1990) and this would need to be taken into account when adjusting experience requirements.

6.3.2 Strengths and imitations

There were numerous limitations associated with testing hypothesis three.

Accessing good quality field data has been a challenge acknowledged within the literature (Harry, 2007; Kobrin, 1988). Accessing secondary data for this study required 11 approval stages with different stakeholders, as shown in Table 44. Meetings were face-to-face either in Milan or Accra or held by conference call. All of these meetings required briefings and PowerPoint presentations. It took time after each meeting for internal discussions to take place before approvals were granted to approach the next person within the chain of approvers. The approvals process took several months before data was acquired.

Table 44: Sequence of approval meetings required

#	Stakeholder	Location	Details
1	SVP Exploration - Eni	London, UK	Met in person to discuss the type of data required and approval process. Approval required by Chief Exploration Officer.
2	Chief Exploration Officer - Eni	Milan, Italy	Met in person (with SVP) to discuss the merits of the research. Approval required by Responsible and Sustainable Enterprise Unit.
3	EVP Responsible and Sustainable Enterprise Unit - Eni	Milan, Italy	Met in person (with six members Responsible and Sustainable Enterprise Unit) to seek internal approval. Informed that this would be managed by VP Responsible and Sustainable Enterprise Unit.
4	VP Responsible and Sustainable Enterprise Unit - Eni	Milan, Italy	Met in person to follow up on the process of accessing data. VP agreed to arrange approval with Eni Ghana Country Manager; once approval received from IFC.
5	Global Head, Advisory Services – IFC, World Bank	Conference call (London to Washington DC)	Approval sought directly through the Global Head, Advisory Services – IFC, World Bank via conference call, who requested further detail and a discussion with IFC Ghana.
6	Senior Operations Officer – IFC, World Bank Ghana	Conference call (London to Accra)	Explanation of the project ambitions, research methodology and data required.
7	Country Manager – Eni Ghana	Internal (Milan to Accra)	Internal approval discussion between VP Responsible and Sustainable Enterprise Unit and Country Manager – Ghana.
8	HR Manager – Eni Ghana	Accra, Ghana	Following approval from Country Manager, I met in person with the HR Manager to discuss details of the research and data required
9	Personnel Manager – Eni Ghana	Conference call (London to Accra)	Introduced the research project over conference call. Explained the details. He approved his team to coordinate the data.
10	Personnel team – Eni Ghana	Conference call (London to Accra)	Conference call to discuss the details of data required and time frame.
11	HR Manager – Eni Ghana	Conference call (London to Accra)	Seven months into the research, the HR Manager position changed, requiring a call to brief on the research and on follow-up

The job role data was requested from Eni Ghana's HR Manager who selected the roles without input from the researcher to reduce risk of researcher influence. The initial data provided was general and more detailed data was requested. It was predicted within the research design that the data acquisition from Eni Ghana would be a challenge, with risks of requiring non-disclosure agreements or not receiving all the desired data. The process required patience and persistence, however was compounded by the limitations of time pressures of a 12 month research period. Nevertheless, detailed job specifications provided by Eni Ghana were made available to the researcher.

The decision trees within this study had a number of advantages. Generally decision trees are widely acknowledged as useful tools for breaking complex decisions into a series of smaller decisions. Once the decision tree framework was built, each job role was modelled relatively quickly. The decision trees were particularly valuable because the same job role could be tested for any year within the project lifecycle. Due to the subjective nature of the decision trees, they could be tailored based on the end user's subjective judgement. Any given job role could be run through the decision tree as it is a standardised framework. It would be possible to adapt the decision tree to another O&G project or company, or a different country's legislative framework. The decision trees could be used to support explanations to Government of the localisation decision making process, explaining why certain job roles can and cannot be localised. The decision tree could help with manpower planning within the HR department. A recommendation for how all decision trees could be presented on one document is included in Appendix C.2.

However the decision trees also had several limitations. The decision trees were very large and included up to 22 principal decisions and multiple sub-decisions at each node. Therefore, presenting the decision trees was difficult. The file sizes of the decision trees were also very large, so data storage could be an issue if large numbers of job roles were to require modelling.

The decision trees were restricted to the criteria of the nodes included within the decision tree. Therefore, they were not flexible to include additional information,

biases or external issues which may not have been considered in the design of the decision trees. Whilst the decision trees had the advantage of being tailored to reach a certain decision, there was also risk of user bias to manipulate the results.

The decision trees alone did not explain how or when to invest in localising a particular job function; they just suggested a strategy. Furthermore, once a decision had been made to maintain an expatriate within a role the consequent branches thereafter were pruned. This meant that information beyond that point is not included about other competencies or requirements that would require development. Multi-criteria decision analysis techniques could address this issue for future studies.

Due to the subjective nature of the decision trees different end-users may chose different decision tree strategies. As each end-user has bias based on their personal experiences the decision trees could be said to have poor inter-rater reliability. To increase reliability and consistency, one representative from Eni Ghana's HR department tested all the decision trees alongside the researcher for each job role.

Decision trees with financial data and probability data would have improved the validity and reliability of this study. For example including expected monetary value (EMV) based on the net present value (NPV) and probabilities for each decision node would have led to a quantifiable decision process. Given that the EMV and probabilities were unknown, this was beyond the scope of this study, so a logic-based decision tree methodology was developed.

Concerning the construct validity of the decision tree, the results worked well to prove the hypothesis. Consideration was given to internal and external validity. With regards to external validity, the results are based on existing job roles. The sample is considered to be representative of the population in Eni Ghana's workforce, so generalisations to other job roles in the organisation could be made.

6.3.3 Summary

The decision trees presented results for 2017 and 2027 scenarios which reflected Eni Ghana's existing JRL strategy. The hypothesis was accepted because it was possible to analyse the viability of localising particular job roles using a decision making methodology.

Decision trees tested for 2017 represented the current position regarding local and expatriate job roles within the sample provided by Eni Ghana. Experience was the main barrier preventing local people from accessing traditionally expatriate job roles in 2017. Decision trees tested for 2027 mirrored Eni Ghana's succession plans, whereby four of the five expatriate job roles would be localised and one would remain an expatriate role.

However, the decision trees did not answer whether localisation reduces costs. Hypothesis four therefore investigated the timeframe and costs of localisation.

6.4 Discussion - hypothesis four

Hypothesis four sought to investigate whether investment in the training and development of local people can enable O&G companies to reduce staffing costs by localising traditionally expatriate job roles. This was achieved by applying training and development investment timelines to a sample of five job roles and comparing the results to the costs of employing expatriates.

Hypothesis four was accepted as the results showed that a localisation strategy would be less costly than employing expatriates.

6.4.1 Implications of the results

Previous JRL studies have suggested that JRL reduces costs, because the costs of employing expatriates is greater than employing local people (Dickmann et al., 2017; Fayol-Song, 2013; Lam & Yeung, 2010). Whilst the costs associated with training and developing local people can be very high (Bhanugopan & Fish, 2007; Worm et al., 2001), it can enhance the output of local employees, increase motivation, reduce staff turnover and encourage a culture of learning within an organisation (Gomes et al., 2015; Huselid, 1995). Despite claims of cost reduction in the JRL literature, there are no empirical studies quantifying the differences between localising job roles compared with employing expatriates, nor do they quantify the timeframes or costs associated with localisation.

Training and development investment timelines

By communicating with ECU, training organisations and universities it was possible to access information about the time and costs associated with specific education, training and development programmes identified as requirements for each role. This data was included within the Gantt chart timelines to backcast when training, education and development investments would need to commence, as has been previously applied by Ashina & Fujino (2013) and Saudi Aramco (2017).

The five job roles would require 13-15 year training and development programmes, including three years of public education and between 10-12 years of industry experience. All job roles would require one individual to participate in the training and development programme, with the exception of the FPSO Company Rep Manager which would require two people. All programmes targeted localisation by 2027, which is when Eni Ghana is legislated to achieve 90% localisation (Petroleum Commission, 2013).

During the university education phase, the Ghanaians would not be paid any salary, but Eni Ghana would cover scholarship and accommodation fees at a Ghanaian education institution. The literature highlights the return on investment and value of companies investing in scholarships (Winthrop, Bulloch, Bhatt, & Wood, 2013). Many organisations assume the quality of education abroad is superior to that provided locally (Mazzarol & Soutar, 2002). Therefore often companies provide international scholarships, as evidenced in Ghana within the interview responses and the example of Tullow Oil working with the British Council sending individuals abroad on scholarships (Arthur & Arthur, 2014; Panford, 2014a). The ambition for the international scholarship is the development of a more rounded individual who has international and innovative perspectives (Varghese, 2008). However, those who return can assume social prestige and have values and ideas not applicable for their home nations (Kim, 1998) or they may not return at all (Playfoot et al., 2014). Furthermore Playfoot et al., (2017) explain that for JRL to be sustainable, O&G companies should invest in building the capacity of local education systems and provide local scholarships. The interviews highlighted that there are many education institutions in Ghana offering O&G related courses despite some concerns relating to curriculum and standards. As a result, it was appropriate to assume local scholarship provisions within the training and development investment timelines. Furthermore there is the opportunity for Eni Ghana to work with education institutions to address the concerns raised regarding the curriculum and standards.

Within the timelines, it was assumed that Ghanaians would be employed straight after an intensive language course. Employment of the Ghanaians would range from two to five years in Ghana, where Ghanaians would be paid a local remuneration package worth \$42,270 per annum (the equivalent to the top local salary provided in Eni Ghana data and assumed additional costs). All roles would require international experience, which would range between five to eight years, where Ghanaians would be paid an expatriate remuneration package of \$106,279 per annum (Africa region's combined median base pay and other compensation data within SPE's (2017) salary survey).

Once the Ghanaians have the required experience, they would return to Ghana maintaining the same remunerations package (\$106,279 per annum). The questionnaire found that expatriates are often paid more than local people (Table 12). There is evidence to show this is the case, for example Obeng-Odoom (2015) found that expatriates are paid three times the salary of local people doing the same job roles in Ghana's O&G sector. The interviews and Ghanaian press suggested disappointment amongst Ghanaian workers about salary differences compared to expatriates (Tables 5 and 26). As such the Ghanaians would maintain their international salaries after the training and development programme and in this way encourage return to the home country and curb the brain-drain.

Costs included expatriates in positions from 2017-2027 during the development programme of the Ghanaians.

NPV calculations with Italian and Ghanaian oil and gas sector WACC discount rates

The net present value (NPV) was calculated for each training and development investment timeline. This included calculating an expatriate working for ten years and subsequent seven years employment of a Ghanaian. A second NPV was calculated for employing an expatriate for the seventeen years of operations. Comparing these two scenarios would show whether the costs of employing an expatriate would be greater than training, developing and employing a local person.

Expatriates remuneration would be paid by Eni in Italy, so the 2018 Italian weighted average cost of capital (WACC) of the O&G sector was used as the expatriate discount rate used, which was 7.76%. Local remunerations would be paid by Eni Ghana, so the 2018 Ghanaian WACC of the O&G sector was used as the local discount rate used, which was 13.04%.

For all five job roles the NPV calculations suggested that it is more cost effective to localise than to employ an expatriate. The cost of localisation varied between 1.76 and 2.21 times when compared to the cost of employing an expatriate. The composite total of localising all five roles was less expensive by \$8,110,291 USD, representing 1.93 times difference.

NPV calculations with no discount rate

When applying a 0% discount rate calculation, representing absolute costs, it is less cost effective to localise the FPSO Company Rep Manager roles than to employ expatriates. The discount rate would need to be 0.36% for localisation to be equivalent to employing expatriates.

It remains more cost effective to localise job roles than to employ an expatriate when using a 0% discount rate within NPV calculations for the four other roles. The discount rates would range between 0.62% and 0.97% for the costs of employing expatriates to be equivalent to localisation. The composite total of localising all five roles was less expensive by \$918,650 USD, representing 1.03 times difference.

Therefore, companies would be likely to reduce costs by localising job roles rather than employing expatriates. This suits the business, whilst aligning with the values of local people who seek employment and with government who seek value addition through local employment (Kim et al., 2017; Marcel et al., 2016). Furthermore, the results add to the existing JRL studies that claim JRL reduces costs.

6.4.2 Strengths and limitations

The training and development investment timelines had multiple strengths, for example, they could be adapted to other countries with similar local content laws. This would support Eni in preparing future localisation strategies. They were visible and clear and could be used alongside the decision trees to explain localisation plans to the Petroleum Commission. Furthermore they could also be used for internal reporting and highlighting the value of localisation amongst internal and external stakeholders.

There are risks in generalising these results to other job roles due to the small sample size modelled. Therefore there needs to be some caution in generalising to the entire Eni Ghana workforce. The five job roles were selected as some of the most challenging roles to localise, so it is possible that they are representative of the population. In future research a larger sample size is recommended.

Eni has a corporate university and an engrained culture of training and development, whereas this facility may not be available within smaller O&G companies (Younger & Giambona, 2011). Furthermore ECU informed the researcher that training and development plans are uniquely developed to address the needs of each individual, whereby there is no one size fits all approach. Training, mentoring and development programmes are tailored to individuals based on gaps in particular competencies, skills and experience.

This model applies to Ghana, which has a 10 year history of O&G activities, including universities that offer appropriate qualifications. If this model was applied to nascent hydrocarbon producing nations, such national education system infrastructure may not be available. Therefore O&G companies would be required to invest in more costly international scholarships and/or local education system capacity building initiatives.

The researcher was restricted by the quality and quantity of information within the job specifications provided by Eni Ghana. Within future studies it is

recommended that industry standard competency frameworks could be utilised to allow cross-industry generalisations.

Time to autonomy varies from person to person, as people have different levels of 'absorptive capacity' meaning individuals learn in different ways and at different speeds (CCSI, 2016; Sigam & Garcia, 2012). The model has had to ignore these individual differences. The model also assumes that an individual must attend all included training courses to gain these competencies, however this may not be the case. Much learning would be gained from on-the-job training, coaching, mentoring and general experience. Accelerated learning, new training methods and simulated learning could reduce time to autonomy.

The costs were based on courses run by private training organisations. Companies could reduce costs through internal training programmes or by commissioning tailored courses for larger groups. Additionally, there may be alternate providers in Ghana or elsewhere offering similar courses for lower prices.

External factors are not included in the job specification data. For example Eni Ghana may wish to retain an expatriate principally because they have greater knowledge of company strategy, which cannot be taught on a course. Therefore this would need to be adapted in future to consider other factors.

One principal issue of the training and development investment timelines is that all investments were recommended to commence before OCTP's operational start date, meaning the timelines could not actually be applied to Eni Ghana. In future projects it would be recommended to model the decision trees and investment timelines during the exploration phase to ensure local people are ready in time for operations.

Additionally, there are significant risks in training, developing and employing an individual for up to 22 years. The individual could leave at any point, meaning that the organisation would need to re-commence the investment or have an alternative strategy. It is advisable therefore to ensure the individual is

committed to the programme prior to investment through an approach that locks them into the company.

There was no weighting in the NPV calculations to factor for wage rises or increases in course costs for each year. Furthermore, no revenue data was included in the NPV calculations, meaning that a negative score was produced, as profitability could not be calculated. Therefore the closer the negative result was to \$0 USD the less expensive the option. For future studies, or for applying this to business scenarios, revenue data and accurate weighting data would increase validity.

Several assumptions were required whilst applying the training and development investment timelines, as shown in Table 45.

Table 45: Assumptions within the investment timelines

#	Challenge	Assumptions
1	Project lifecycle	Eni Ghana expressed all roles would be required for the full 17 years. The investment timelines were based on OCTPs 17 year operational cycle.
2	Training and progression	Training programmes would take place during employment and not at the end of the job role cycle. Job roles would have a 10-12 year career progression to gain appropriate experience. It was assumed that there would be jobs available in Eni Ghana.
3	Soft skills development	Leadership development courses, mentoring, coaching and experience cover multiple soft skills; rather than individual courses. As soft skills require continuous learning it is assumed this would be on-going.
4	Experience	An individual would gain all necessary skills, knowledge, training, qualifications and experience during the “experience” aspect of the development programme.
5	Training length	ECU highlighted that training courses average five days.
6	Quality of courses	All courses chosen were assumed to be Eni approved training providers. For education it was assumed the curriculum quality is sufficient, suitable equipment, and competent professors.
7	Costs for local employment in Ghana	Local pay was based on the highest local salaries provided by Eni Ghana: 25,000 Euros per annum. Buffers of 10,000 Euros per Annum were also included. Total = \$42,270 USD per annum.
8	Costs for local’s international employment	For the Ghanaian’s international experience an expatriate remuneration package with average salaries of \$91,388 USD and \$14,891 USD additions. Total = \$106,279 USD per annum, which was the median African compensation (SPE, 2017).
9	Quality of Ghanaian	After training and development the knowledge, skills and competence and output of the local person would be equal to that of an expatriate.
10	NPV discount rates	7.76% was the 2018 Italian WACC of the O&G sector and 13.04% was the Ghanaian WACC of O&G.
11	Unknown costs	An additional buffer of \$10,000 USD per annum is included throughout the training and development period.
12	Availability of Ghanaians	There are no skilled personnel available in the country, so the operating company must invest in university education.

6.4.3 Summary

The training and development investment timelines have proven it is plausible to estimate the costs and time frames associated with JRL. In both scenarios, using discount rates based on the WACC of the O&G sector in each employing country and with at 0% discount rate the costs of localisation are less than the costs of employing expatriates.

Despite limitations and weaknesses associated with the timelines, hypothesis four was accepted, therefore early investment in the training and development of local people enables O&G companies to reduce staffing costs

6.5 Discussion - recommendations from the findings

The generalisations within the findings have led to the following recommendations for the O&G industry and for governments.

For host governments and O&G companies

- **Local often refers to national** - Whilst it is very important to consider locally affected communities, this study has found that most people considered 'local' to be synonymous with national. In the context of this case study therefore, 'local' referred to the Ghanaian workforce. Governments and industry are recommended to agree on a standardised definition of 'local'.
- **Prevalence of localisation and planning roles early** - Globally, governments and industry are increasingly conscious of the value of building a competent local workforce. This study found that workforce development is the responsibility of both governments (such as the Petroleum Commission in Ghana) and industry (such as Eni Ghana). Clarifying the roles of government and industry early on in a project's lifecycle is key.
- **Collaboration, transparency and communication** - Good relationships, communication and reporting between governments and industry are essential to ensure the lasting impact of local content policies. Embracing a trusting relationship between both parties is encouraged, underpinned by transparent and strong government institutions and dependable and honest actions from O&G companies.
- **Consistent dissemination of information** - Governments and industry should improve their approaches to disseminating information about O&G employment opportunities for local people. Job role opportunities had not been well communicated in Ghana, worsened by media hype, leading to frustration amongst Ghanaians. There should be a consistent message about O&G only having limited employment opportunities. In order to manage expectations it is suggested that governments and

industry deliver a joint message to local people about the number and types of roles required and when those roles will be needed.

- **Experience is a major barrier** - In newly producing hydrocarbon nations a lack of an experienced local workforce was found to be a significant barrier in Ghana. The 2017 decision tree scenarios showed that Eni Ghana were unable to find local people with sufficient experience for highly skilled job roles. Governments and industry should commence early with strategies to develop local people with the requisite experience.
- **Competition and the diaspora** - Competition for senior level expertise is raised when there is limited talent available locally, as was found in Ghana. It is recommended that governments and industry develop strategies to encourage the diaspora to return, including international wages.
- **Developing a workforce takes time** - It takes significant time to train local people to be capable of taking on traditionally expatriate job roles, as highlighted within the decision tree scenarios for 2017 and 2027. Industry and governments should agree on the length of time it takes to develop the local workforce following a gap analysis of the capacity of the local education system and availability of the required workers in the local labour market. Investment strategies into training and education should take into consideration the lag time between initial investment and the time it takes to educate and train people.
- **Localisation as sustainable** - Localisation should be encouraged as a sustainable choice amongst governments, industry and their contractors. The investment timelines found that given enough time, if companies invest in training, education and development of local people then any job role could theoretically be localised. This in turn meets the values of all stakeholders.

O&G companies

- **Local employment expectations** - This study found that the principal expectation of local people is job opportunities within the O&G industry. In Ghana expectations for jobs were enormous. Employment has a major impact on companies accessing the 'social license to operate'. Therefore it is advised that JRL is not just a compliance issue, but is actively promoted as a business need to help meet local expectations for jobs and to increase the likelihood of accessing the 'social license to operate'. It is recommended that job roles that can be localised easily should be localised as early as possible.
- **Localisation in company planning** - Operational planning, budgeting and personal goals should be linked to the long term localisation planning objectives. Effective planning should ensure alignment between the business, HR and local content departments. This will create a positive working culture that embraces JRL and avoids the hiring of 'ghost workers' that do not add value to the business operations.
- **Expatriates and localisation** - Expatriates should be encouraged to support, value and trust local staff. Expatriates should be provided with inclusion training and incentives for knowledge sharing to avoid a culture of 'them vs. us'. Additionally, expatriates should be provided with clear career pathways to avoid talent attrition and frustration at the prospect of localisation causing redundancy. Companies should avoid a biased culture in favour of expatriates.
- **Transferrable skills from other sectors** - Many job roles include transferrable skills from other sectors. Therefore it is recommended that talent acquisition departments examine the applicability of job specifications from other sectors. However, recruitment should be done sustainably so as not to out-price other sectors. Companies should be mindful of the continuing need to build talent within the local labour market by investing in training and education.
- **Not all jobs should be localised** - Certain jobs should not be localised, as shown by the Exploration Manager role in this study, which was

considered too high risk for the role to be localised within the time frame. Decision trees can be used to decide which job roles should and should not be localised. Scenarios can be modelled for different timeframes to support succession planning strategies. Companies are therefore advised to implement the decision tree methodology, which can also be used to support explanations to regulators about why certain roles can and cannot be localised.

- **Adapt to local context** - HR strategies should be adapted to reflect national context, whilst maintaining parent company best practices. Many Ghanaian national context factors which affected JRL were found in this study. The unique characteristics, hiring traditions, working culture, behaviours and legislations of any country should therefore be considered when developing localisation strategies.
- **Commonalities of the local workforce** - In addition to the national context affecting strategy, it is advised that companies seek to understand commonalities within the local workforce. Ghanaians were for example described as respectful of hierarchy, disliking communicating failure and acting within a wider family context of society. This is of course not to say that Ghanaians are a homogenous group, but rather that common themes emerged in the findings.
- **JRL backcasting for each role** - By implementing training and development investment timelines for each job role it is possible to backcast when investments would need to commence with an estimate of costs. This has numerous advantages:
 - **Cost reduction** - This study found that education, training and employment of local people is less expensive than employing expatriates. Companies should be aware that the process takes longer than employing expatriates.
 - **Maintain experience requirements** - This study found that companies have had to adjust their expectations of the number of years of experience for job roles to comply with legislated localisation targets. For example, the Production and Maintenance

Readiness Manager role on paper requires 12 years of experience, but Eni Ghana has had to localise in under ten years. The advantage of the backcasting model in this study allows companies to build timelines in order to plan ahead to ensure that local people have all the necessary experience required within the job specifications at the time of taking on the job role. This mitigates the risk of hiring or advancing inexperienced local people too soon.

- **Expatriates are crucial** - The investment timelines require expatriates to be involved until local people have the qualifications, skills and competencies required to replace them. Therefore companies benefit from reaching localisation targets and can employ highly skilled expatriates in early operational stages.
- **Locals are paid well** - This study found that expatriates are often paid more than local people, which can be a cause of conflict. Therefore, companies are recommended to follow the backcasting model, whereby local people would maintain their international salaries when they return from the international experience phase. This would increase retention and reduce conflict. However companies should be mindful that other sectors may not be able to pay similar salaries, which could reduce their competitiveness.
- **Start early when investing in JRL** – In each case within this study, training and development investments needed to start prior to the commencement of the operations phase. Evidence shows that if companies do not invest early then companies have to accelerate the development of local people and reduce experience requirements in order to comply with local content targets. To avoid this, early investment is recommended in line with training and development investment timelines developed in this study.
- **Education investment** – O&G companies should actively invest as early as possible in local education systems by advising on curriculum

alignment, providing field experience and offering up-to-date laboratory equipment. Additionally:

- **Invest in local** - Companies should prioritise capacity building and scholarships at local universities over international scholarships. To enable companies to do this there should be investment in local institutions in order to raise their standards, improve health and safety and to increase practical hands-on training.
- **Core to business** - Furthermore senior management in O&G companies must be provided with a robust business case of the value of local education investments. It is recommended that education investments should be considered core to business strategy and not corporate social responsibility.
- **Monitor the effectiveness** - Approaches to measure and monitor the effectiveness of education investments should be applied by companies. Should investments become ineffective they should be readdressed.
- **Companies collaborating** - Where there are shared interests in workforce development, companies should avoid working in silos. Initiatives such as Field Ready in Ghana provide evidence of companies working in an alliance to raise the skills of local people. Companies are advised to collaborate in common and non-competitive workforce development and capacity building initiatives.
- **Non-technical skills development** - Whilst companies should enable staff and contractors to have on-the-job training offshore where possible to advance technical skills, it is necessary to address non-technical skills too. It is recommended that companies encourage mentoring and coaching programmes; as well as more formal training associated with communication, inclusion, teamwork and health and safety.

Host governments

- **National benefit** - O&G was described as the principal opportunity for economic growth in hydrocarbon producing nations. However often the benefits are not evenly distributed nationally, for example in Ghana O&G benefits should reach beyond the Western Region. In order to avoid 'Dutch disease' symptoms and national discontent about O&G impacts, it is suggested that strategies are developed to ensure that the benefits of O&G are far reaching.
- **Agency alignment** – This study found that in Ghana there was institutional strength, a pro-business approach and clear differentiation of purpose between different government agencies. However globally it was found that national and local governments are often not aligned. It is recommended that governments invest in their own capacity building and strive for institutional strength. Furthermore it is recommended that governments develop a shared narrative across national and local governments and between government agencies.
- **Education investment** – Education institutions are often not aligned with the needs of industry. In order to raise standards and capabilities, government should invest directly in education capacity building and create an environment where O&G companies are encouraged, supported and incentivised to invest to. Additionally:
 - **Technical and vocational education stigma** - To overcome the negative stigma attached to technical and vocational education, governments should promote this route as a positive alternative to university education.
 - **Women in energy** - To increase the number of women entering O&G professions, governments should work with parents and their daughters to highlight the value of maths and science courses and pursuing technical career paths within the O&G sector.
 - **Collaboration internationally** - It may be viable to collaborate with neighbouring countries and 'regionalise' specialised skillsets.

- **Labour market shortfalls** - The result of limited number of workers with sufficient education and experience within the labour market means companies employ expatriates. Governments should be aware of this and seek to support companies in addressing the shortfall in the availability of local people instead of enforcing sanctions.
- **Local content metrics** – This study found that local content metrics often do not benefit local employment. Countering this, local content regulations were expected to increase Ghanaian employment. It is therefore suggested that the regulations are frequently monitored to assess their successful in effecting change.
- **Monitoring localisation** – This study found that local content legislations enforced by regulators can put pressure on companies to localise. There is value in advancing local people into job roles, however there are risks of advancing local people too quickly into positions for which they may not be adequately prepared. It is recommended governments and industry communicate the details of job roles and use this study's decision tree methodology to determine which job roles should be localised, and which should not.

7 Conclusions

Job creation for local people is a principal objective of local content legislations (Tordo et al., 2013). O&G operating companies and their contractors are mandated to abide these legislations by host governments of O&G producing nations. One method of job creation is JRL, which is the process of training and developing nationals with the appropriate education, competencies and experience to enable companies to replace expatriates with nationals. For companies it can be immensely challenging to achieve the JRL targets set by host governments.

The aim of this study was to investigate whether localising job roles within the O&G industry is viable and can reduce costs. In order to address the research aim, four hypotheses were tested. The study included an extensive literature review that examined extant literature regarding local content and localisation in O&G, with particular focus on Ghana and one O&G company, Eni Ghana. An explanatory sequential design methodology was used, shown in Table 4. Opinions were gathered about local content and JRL issues from respondents with different backgrounds including O&G companies, education institutions, training and consulting companies and governments. National context specific factors which impact JRL in Ghana were identified. The viability of localising particular job roles was examined using a decision tree methodology, with a case study from Eni Ghana. Training and development timelines of different job roles were used to model whether O&G companies can reduce staffing costs by localising expatriate job roles. The results from each phase fed into the subsequent phase.

A questionnaire about local content and localisation issues was distributed to a sample of 330 experienced stakeholders. The objective was to identify similarities and differences of experiences and recommendations amongst different stakeholders associated with JRL within the global O&G industry. The findings were that different stakeholders agree about local content issues more frequently than they disagree.

A sample of 31 different stakeholders associated with Ghana's O&G industry were interviewed. The objective was to identify factors which affect JRL in Ghana, a country that is in the process of localising its O&G industry. The results showed the importance of understanding national context characteristics when developing JRL strategies.

A standardised logic based decision tree was applied to a sample of ten job roles in Eni Ghana, in order to assess the viability of localising particular job roles. Decision trees were found to be an effective tool that can be used as a methodology to assess the viability of localising job roles over different time frames.

Training and development investment timelines were modelled on a sample of five expatriate job roles to quantify whether the costs of training, developing and employing local people was less than the costs of employing expatriates. The results showed that investing in the training and development of local people can reduce costs for O&G companies.

The research aim was addressed, and this study has found that JRL is viable and can reduce costs.

7.1 Significance of findings

This study found that governments and O&G companies worldwide are seeing greater value in localisation. When considering terms such as localisation and local content, this study showed that 'local' is largely perceived as meaning 'national', and is not restricted to locally affected communities.

It was found that localisation must stimulate employment and economic benefit evenly across the whole nation to avoid symptoms of the resource curse. This requires a national strategy which is supported by all government bodies, with strong institutions and good governance to effectively oversee and monitor localisation efforts. Furthermore trusting and transparent relationships between all stakeholders are essential.

This study showed that the principal expectation of local people of O&G projects is employment. However there are relatively few job opportunities within the O&G sector. Therefore, governments and O&G companies need to clearly communicate this to local people and not over-exaggerate the numbers of jobs that will be available.

The findings of this study showed that poor education alignment with the O&G industry leads to few qualified or experienced local people within the labour market. This in turn forces companies to employ expatriates. In order to ensure the domestic labour market meets the needs of industry, both governments and industry should invest in advancing local education system standards and capabilities, as has been recommended previously (Gylfason, 2001; Mtegha & Toigo, 2015; Panford, 2014a).

O&G companies are often under pressure to localise job roles by governments, as shown in this study's case study of Eni Ghana. However the decision making processes behind localising job roles can be challenging and complex, due to limitations within the labour market and the risk of early promotion of local candidates as described previously (Fayol-Song, 2013; Hailey, 1996). The decision trees within this study were shown to be a novel and appropriate methodology to assess the viability of localising job roles.

Many existing studies suggest that JRL can reduce costs, without quantifiable evidence to substantiate these claims (Dickmann et al., 2017; Fayol-Song, 2013; Hickey, 2017). This study highlighted that whilst not all job roles should be localised, the training and development investment timelines presented empirical evidence to suggest that JRL can lead to cost reductions.

Furthermore this study found that expatriates often receive greater remuneration than local people which can lead to conflict and issues of trust. Within the training and development timelines, local people should return from their international placements and maintain their international salaries. Furthermore companies would maintain the value of employing expatriates during the training and development process.

The decision trees and training and development timelines highlighted that the experience, qualifications and competencies required for a job role will determine how easy it is to localise a particular role. Certain roles may be deemed too high risk to localise by an O&G company, and others require significantly more investment in education, training and development. Furthermore companies must understand and adapt to the local context as this can add barriers, limitations or indeed opportunities to support JRL.

Under pressure of localisation targets, companies to date have needed to be flexible in job requirements in order to meet the targets, with early promotion of local employees. This study has shown that a systematic approach to decision making and investment could mitigate the risk of advancing people too quickly. The backcasting of investments highlighted the need for companies to invest early in training local people ahead of the operations phase for O&G companies to be in a position to comply with localisation quotas.

Neither decision trees, nor investment timeline modelling have been included in existing literature about JRL, so they are novel and offer the opportunity for further research and for application within industry. Companies can use them to assess how and when to invest in localising job roles and support explanations to government of JRL decision making.

In summary this study has found that localising job roles within the O&G industry is viable and although not all job roles should be localised, JRL can reduce costs through early investment in the training and development of local people.

7.2 Recommendations of future work

A limitation of this study was the focus on just one company in just one country. Future studies could be used to draw comparisons between multiple companies and countries to compare differences and similarities. This study focussed on the O&G company. In future studies taking the perspective of the government or major contractors would be interesting.

JRL in regions and countries such as the Middle East and China have been well researched. However, there have been limited studies in developing countries where the labour market is undersupplied. There are opportunities to replicate this study in other developing countries. Similarly there are opportunities to research into JRL in alternative sectors, from brewing to agri-business.

It was beyond the scope of this research to investigate the effectiveness of localising job roles. Future studies would be valuable that examine the effectiveness of JRL, having applied the decision tree methodology and training and development investment timelines.

Existing research has focused on the localisation of managerial job roles. It would be valuable to investigate the localisation of non-managerial positions. Furthermore, this research focused on the operational phase of an O&G project; for future studies researching JRL in different project phases would be beneficial.

The scope of this research did not touch upon issues such as increasing the participation of youth, women, locally affected communities or disadvantaged people into job roles. There would be scope for future studies to examine these areas.

Within the decision tree methodology adding probabilities would increase the reliability of the results. Additionally using different decision methodologies would be valuable, such as a multi-criteria decision analysis technique. Likewise for the training and development investment timelines, adding greater detail to the job specification data would improve the usability of the timelines.

7.3 Final thoughts

Local content policies have the opportunity to stimulate local employment and economic growth. Within the realm of local content, there is a drive to increase local workforce participation within the industry. Whilst JRL can only have

limited impact on national economies due to the low number of available jobs in the O&G sector, it remains a key aspect of local content strategies.

Effective JRL can have major benefits whilst addressing the values of governments, industry and local people. O&G companies however are unique in requiring very high technical standards of the workforce in order to avoid O&G catastrophes. This can be a highly significant barrier to JRL if people with the required competencies, skills and experience are not available within the local labour market. As O&G companies are increasingly encouraged to localise their workforces by host governments, it is important to understand how much localisation can be achieved, whose responsibility it is to develop the local workforce and whether or not it is economically viable to localise job roles.

This study has highlighted that different stakeholders largely agree about local content issues. It has shown the need to consider national context factors that can affect JRL. Furthermore, decision-making about which job roles to localise is challenging, but decision trees can be used to support this. Whilst not all job roles should be localised, this study suggests that it is viable to localise certain job roles and that it is more cost effective to train and develop local talent rather than employing expatriates.

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APPENDICES

Appendix A - Hypothesis one

A.1 Questionnaire

Jack Pegram

MSc. Survey on Localisation

xxx@cranfield.ac.uk

Your views will remain completely anonymous:

1. Which best describes the company you work for:

- a. Government or National Oil Company
- b. International oil or services company
- c. Training/consulting organisation
- d. Public university/academia
- e. NGO/Aid organisation
- f. Association

2. When considering “local” within local content, what do you consider as local?

- a. National scale (ie person living in that country)
- b. Community scale (ie near the operating site)
- c. Both

3. Who are responsible for developing a local workforce that meets their industry standards

- a. E&P companies (and their major contractors)
- b. Government
- c. Both

For the following statements please consider your personal opinion from general experiences, choose the answer you feel is most accurate.

1. All job roles should be localised rather than using expatriate labour

-
- Strongly Agree Agree Neutral Disagree Strongly Disagree

2. Expatriate are paid more than local workers within the E&P sector

Strongly Agree Agree Neutral Disagree Strongly Disagree

3. The mind-set is changing by governments and E&P companies for a greater need to develop the local workforce and supply chain

Strongly Agree Agree Neutral Disagree Strongly Disagree

4. It is in the interest of E&P companies to invest in local procurement for cost savings and improved quality

Strongly Agree Agree Neutral Disagree Strongly Disagree

5. Enterprise development centres are the most effective way to increase local SMEs participation

Strongly Agree Agree Neutral Disagree Strongly Disagree

6. Governments should focus on multi-sector skills and not those specific to oil and gas

Strongly Agree Agree Neutral Disagree Strongly Disagree

7. National and local governments are completely aligned in their national development strategies

Strongly Agree Agree Neutral Disagree Strongly Disagree

8. Percentage based local content metrics do not benefit local employment

Strongly Agree Agree Neutral Disagree Strongly Disagree

9. Oil and gas operations provide nations with the greatest opportunity to grow economically

Strongly Agree Agree Neutral Disagree Strongly Disagree

10. The socio-economic benefits from oil and gas projects are evenly distributed across the economy

Strongly Agree Agree Neutral Disagree Strongly Disagree

11. It is more cost effective to build local education capacity locally than to send local people internationally for education and training

Strongly Agree Agree Neutral Disagree Strongly Disagree

12. Local education institutions are completely aligned with the needs of industry

Strongly Agree Agree Neutral Disagree Strongly Disagree

13. E&P operations in projects have more negative impacts for local communities than positive impacts

Strongly Agree Agree Neutral Disagree Strongly Disagree

14. Local community engagement, education initiatives and supply chain development is most effective when led by the local operations teams in country by E&P companies

Strongly Agree Agree Neutral Disagree Strongly Disagree

15. Employment is the greatest expectation by local people from oil and gas projects

Strongly Agree Agree Neutral Disagree Strongly Disagree

16. Investing early in local education institutions will ensure local people are trained to industry standards

Strongly Agree Agree Neutral Disagree Strongly Disagree

17. E&P companies work effectively together in country to develop strategies around local procurement and investment strategies for education

Strongly Agree Agree Neutral Disagree Strongly Disagree

18. Governments and industry can improve the way they disseminate information about employment and procurement needs to the population over the lifecycle of a project

Strongly Agree Agree Neutral Disagree Strongly Disagree

19. Governments of different countries within a region should work together to collaborate over specialisms within skills areas

Strongly Agree Agree Neutral Disagree Strongly Disagree

20. The oil and gas industry will only focus for developing local skills should be on multi-sector skills if they are incentivised to do so by the government

Strongly Agree Agree Neutral Disagree Strongly Disagree

Considering your experience/observations in implementing “localisation”:

1. What was the biggest success factors and why?

.....
.....

2. What were the barriers to succeeding/biggest failure and why?

.....
.....

3. If someone was developing to do a localisation plan, what is your advice?

.....

.....

A.2 Questionnaire information sheet



Developing a decision tool for E&P companies to assess whether localising job roles can reduce costs, whilst increasing their social license to operate

Survey

You are invited to participate in this survey, by completing the questionnaire. This can be given to me in person or can be emailed or posted to me. Your response will be kept anonymous; the only information provided will be the type of organisation you work for. You are free to withdraw your questionnaire responses at any time. The study complies with Cranfield University ethical requirements and there are no foreseen risks associated with the questionnaire.

Research Aims

This M.Sc. by Research is investigating whether oil and gas companies can reduce costs throughout the project lifecycle by localising job roles, whilst adding value to the economy through local employment. I will develop a “decision tree” tool for Eni to assess whether to implement a strategy to localise particular job roles.

Motivations

- Oil and gas can stimulate economic diversification, reduce poverty, and increase economic prosperity, offering shared value creation for industry, countries and local people.
- The industry is highly capital intensive, yet low labour intensive. The main way local people expect to benefit from oil and gas is through jobs.
- In theory, if the oil industry and government can plan together in advance what job roles are required, early investment in local education and training can deliver national people to meet the direct and needs of the industry.

Ghana as a case study

Ghana has been chosen because Eni has just achieved ‘first oil’ and because Getenergy has experience and connections in Ghana as a result of our Field Ready programme and events. The government, and population of Ghana have

a major aspiration to avoid ensure lasting economic prosperity as a result of oil and gas.

Next steps and Data

I will hold informal discussions with representatives from industry, government and education to discuss the specific context for Ghana. The next steps are to identify 10 job roles in Ghana; choosing from different categories of job function required over different phases of the project lifecycle. After defining the characteristics (e.g. certifications and experience) that would enable or prevent a job role from being localised, I will formulate a series of actions, criterion or decisions that would be needed to raise the capabilities locally to improve the employability of local people, These would form a “decision tree” and “road map” to enable Eni to assess whether the costs of localisation outweigh the benefits.

Contact: Jack Pegram, MSc Student, Cranfield University (xxx@cranfield.ac.uk)

Appendix B - Hypothesis two

B.1 Interview guide

Interviews: Understanding the challenges for local Ghanaians in gaining employment in the Ghanaian oil and gas industry

To read before all interviews:

“The aim of this interview is to collect opinions from different people across Ghana’s oil and gas industry. It seeks your personal experiences related to employment opportunities for Ghanaian nationals in gaining employment in the country’s oil and gas industry. I will not ask specific questions, but instead ask questions around some general topics. I am doing this interview as part of an MSc research project at Cranfield University, with the ambition to create a tool that companies can use to assess what it would take to increase local participation. All your answers will be treated completely confidentially, and you can decline to answer any question.”

All interviews

Opening question:

- What are the main factors preventing Ghanaians from getting jobs within the oil and gas industry?

General attributes:

- Could you talk to me about whether gender impacts localisation?
- The same for...Religion?
- The same for ... Age?

Legislations:

- What do you perceive is the role of local content policies?
- How important is the role of the “social license to operate” for companies?

Local context:

- Do you perceive there are any local cultural issues to consider?
- What is the local perception of the oil and gas industry?
- Do Ghanaians want to work in the industry?
- What is the perception of vocational job roles vs. management roles?
- What is the biggest fraction caused by the oil and gas industry amongst Ghanaians?

- Could you describe the general culture towards HSE

Education and experience:

- In your opinion is “education” a barrier to localisation?
- To what extent is “experience” a barrier to localisation?
- Whose responsibility is the training of Ghanaians for the industry?
- What existing initiatives already exist to increase Ghanaian’s skills developments?
- Please describe your experience of recruitment in Ghana?
- Are you aware of links between industry and education?

Expats

- What is the general perception of expat workers in the industry?
- Do expats receive more benefits than local people?

For industry employers

- Which jobs do you not employ Ghanaian people?
- Why not? How long would it take? What would it take?
- Which job roles are easiest and hardest to hire for?
- Does gender play a part in the decision making over job roles?
- How would you describe the Ghanaian workforce?
- How effective has the Government’s role been in localisation?
- How has local content impacted your hiring plans of Ghanaians?
- Who does your recruiting?
- How do you plan around the fluctuations based on project phases?
- What is the responsibility of the contractor in meeting local content requirements?
- How important is behavioural and soft skills?
- How do you decide the salary of employees?
- What is the biggest challenge faced by local Ghanaians working in your organisation?
- Is it possible to avoid just hiring a low skilled labour?
- The relationship between contractor and operator about the recruitment and training?
- Does type of contract play a part in job role localisation?
- Is the cost of employment of local people greater or smaller than expats?
- Can you tell me your experience of managing local people’s expectations of jobs
- Is there an ambition for locals to grow through the company? What are the obstacles?

For government

- What is the role of your government in the employment of Ghanaian nationals?
- What have been the key barriers for employment of Ghanaian nationals?
- What factors could be involved to increase local employment?
- What has industry described as the barriers preventing local people from being employed?

For students

- Where do you want to get to within the oil and gas industry?
- What are the barriers you perceive?
- What is your education and training background?
- Is there a balance of jobs for men and women?
- How much information is available to you about reaching the standards required by companies?
- What is the government's role in Ghanaians accessing jobs in the industry?

B.2 Interview information letter



Dear xxx

Thank you for agreeing to participate in this semi-structured interview.

As you are aware, I am currently working on a research project as a student of Cranfield University, focused on localisation within Ghana's oil and gas industry. The aim of the research is to assess localisation of a global scale, which I have done through an international survey with 350 people from 40 countries. Additionally, the project seeks to focus on the Ghanaian context, and I am using literature and the meetings I will have whilst in Ghana with representatives from Government, industry and education to formulate that context. Following this I am working with Eni in Ghana to develop a decision analysis tool as a case study to support industry in Ghana with their localisation strategies (in line with LI2204).

During the interview, I will write notes but not record the interview. Should you agree to me using your comments within my thesis, I will keep them 100% anonymous and confidential. There are no foreseeable risks to you. If I were to use the notes, I would just refer to the comments as being said by a "representative from industry/government/education". At no point in the research thesis will I refer to you personally, your job title, or your company, provide any private details about you. It would be simply included as a phrase that someone from industry said, to help explain the Ghanaian context. My research remains within the ethical guidelines of Cranfield University.

Appended to this are two documents, the first is a detailed explanation of my research project in one page and the second is a consent form. I also include my student pass as evidence of my studentship with Cranfield University.

Following the interview I can send a copy of the notes, you are welcome to request any amendments. If you have any questions about the study, please do email me at xxx@cranfield.ac.uk or call me on +44 xxx. I would be delighted to share the results of the research once the research is complete in 6 months' time.

I would be very grateful if you would be willing to sign and return the consent form.

Yours sincerely,

Jack Pegram

B.3 Interview information sheet



Developing a decision tool for E&P companies to assess whether localising job roles can reduce costs, whilst increasing their social license to operate

Research Aims

This M.Sc. by research is investigating whether oil and gas companies can reduce costs throughout the project lifecycle by localising job roles, whilst adding value to the economy through local employment. I will develop a “decision tree” tool for Eni to assess whether to implement a strategy to localise particular job roles.

Motivations

- Oil and gas can stimulate economic diversification, reduce poverty, and increase economic prosperity, offering shared value creation for industry, countries and local people.
- The industry is highly capital intensive, yet low labour intensive. The main way local people expect to benefit from oil and gas is through jobs.
- In theory, if the oil industry and government can plan together in advance what job roles are required, early investment in local education and training can deliver national people to meet the direct and needs of the industry.

Ghana as a case study

Ghana has been chosen because Eni has just achieved ‘first oil’ and because Getenergy has experience and connections in Ghana as a result of our Field Ready programme and events. The government, and population of Ghana have a major aspiration to avoid ensure lasting economic prosperity as a result of oil and gas.

Survey and informal interviews

A survey of over 300 people worldwide about localisation issues has been conducted with over 210 responses from 40 countries. These validate that there is no ‘one size fits all’ approach. 89% agreed that employment is the greatest expectation by local people from oil and gas projects. Oil and gas companies and governments must find solutions to enable the development of a local

workforce. Additionally I will hold informal discussions with representatives from industry, government and education to discuss the specific context for Ghana.

Existing work

There are many tools that measure impact through input/output impact assessments or best practice recommendations such as (IPIECA Local Content). However, there are no practical tools to apply a decision framework for localisation. The tool from this research seeks to assess whether the costs outweigh the benefits for localising a job role, and put in place a strategy to succeed in investing locally to deliver.

Next steps and Data

The next steps are to identify 10 job roles in Ghana; choosing from different categories of job function required over different phases of the project lifecycle. After defining the characteristics (e.g. certifications and experience) that would enable or prevent a job role from being localised, I will formulate a series of actions, criterion or decisions that would be needed to raise the capabilities locally to improve the employability of local people, These would form a “decision tree” and “road map” to enable Eni to assess whether the costs of localisation outweigh the benefits.

B.4 Consent form template



INFORMED CONSENT FORM

Title of the Project:	Developing a decision tool for E&P companies to assess whether localising job roles can reduce costs, whilst increasing their social license to operate
Name of the Researcher:	Jack Pegram
Researcher's Contact Details:	xxx@cranfield.ac.uk
Date:	

1. I confirm that I have been informed about the aim and objectives of this research project and agree to give my inputs.
2. I understand that all personal information that I provide will be treated with the strictest confidence and my name will not be used in any report, publication or presentation. All raw data remains anonymous.
3. I understand that the information I provide will be used by Cranfield University for the purpose of research only. The data will be stored on a secure network accessed only by authorised users in accordance with the Data Protection Act (1998).
4. I understand that the results of the research may be published in scientific journals, and an anonymised version of the data may be published in support of these results.
5. I understand that I am free to withdraw from this project at any stage during the session simply by informing a member of the research team, for whom contact details have been provided. I also understand that I can also withdraw my data for a period of up to 7 days from today, as after this time it will not be possible to identify my individual data from the aggregated results.

I confirm I have read and fully understand the information provided on this form and therefore give my consent to taking part in this research.

Participant's signature:		Date:	
Participant's name:			
Researcher's signature:		Date:	

Appendix C - Hypothesis three

C.1 Overview of the sample of job roles

The following Appendix provides an overview of the 10 job roles selected by Eni Ghana for the sample, five of which are held by expatriates in Table C-1 and five of which are held by Ghanaians in Table C-2.

Table C-1: Sample of five expatriate roles (source: Eni Ghana)

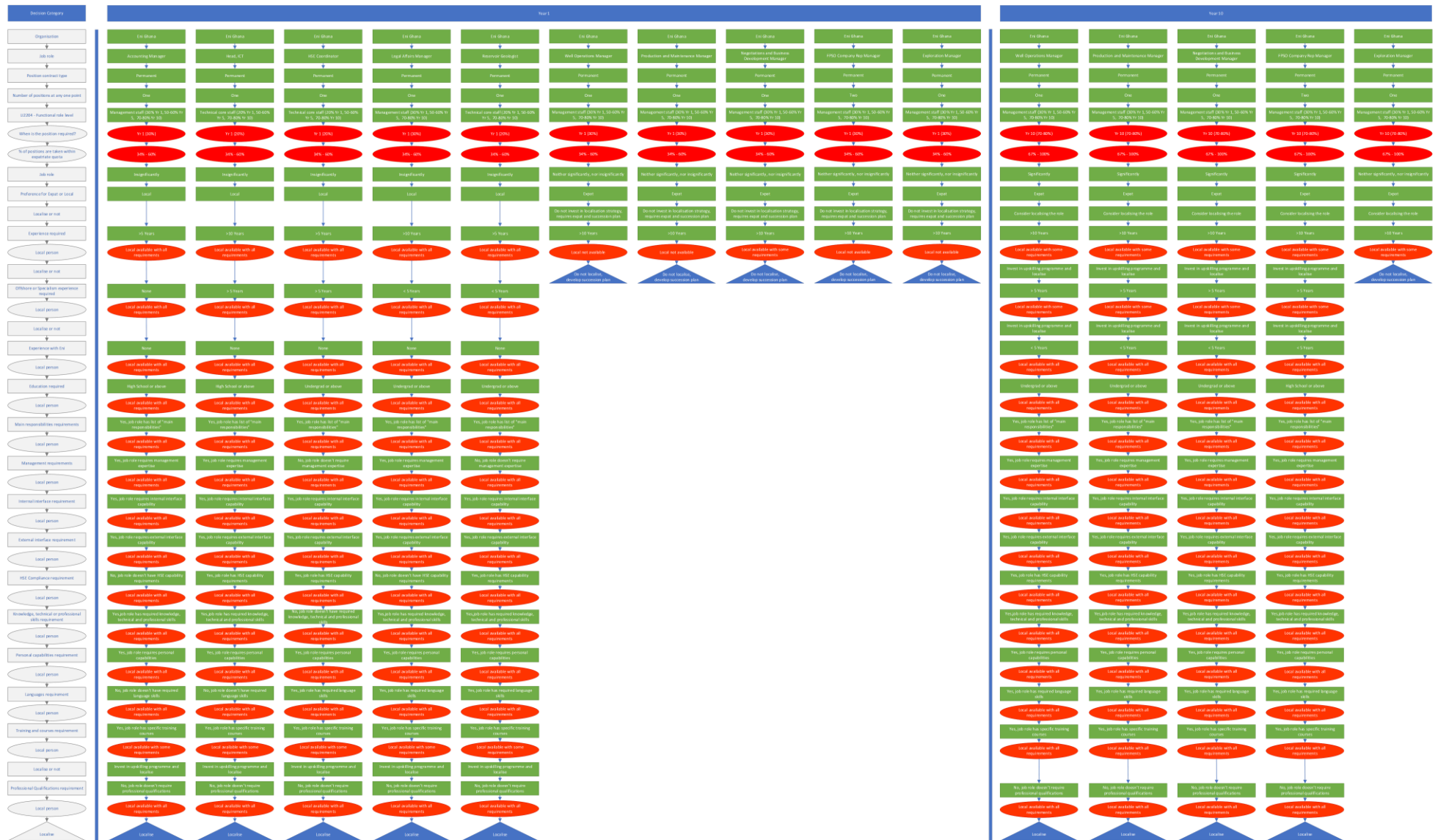
	Positions	Expected Cost of Role per Annum (Salary+accomodation+ transportation .etc)	Estimated Salary Per Annum	Job Description
EXPAT ROLES	FPSO Company Rep Manager	Euro 165,700 - 200,000	Euro 140,000 - 150,000	To manage production and maintenance operations (FPSO operations, subsea operations, laboratory, maintenance activities, measurement, inventory, Opex etc).
	Exploration Manager	Euro 200,000 - 250,000	Euro 140,000 - 150,000	To manage exploration activities, providing proper definition of exploration strategies to ensure optimisation of hydrocarbon potentials of the operated licence within approved programmes and budget.
	Production & Maintenance Manager	Euro 200,000 - 250,000	Euro 140,000 - 150,000	To provide leadership in ensuring plant operatability and asset integrity. Also provide support for safe and smooth commissioning, start up and ramp-up, to reach operating levels in production.
	Negotiations & Business Development Manager	Euro 200,000 - 250,000	Euro 130,000 - 150,000	To negotiate and close business deals, develop business plans that include marketing strategies, maintaining extensive knowledge of current market conditions and reporting to management while building and maintaining important commercial relationships.
	Well Operations Manager	Euro 200,000 - 250,000	Euro 145,000 - 150,000	To provide engineering support in all aspect of exploration & production drilling, work-overs, well testing and other well interventions for the company's operated ventures and to oversee non-operated ventures relating to similar well interventions.

Table C-2: Sample of five local roles (source: Eni Ghana)

	Positions	Expected Cost of Role per Annum (Salary+accomodation+ transportation.etc)	Estimated Salary Per Annum	Job Description
LOCAL ROLES	Account Manager	Euro 20,000 - 25,000	Euro 20,000 - 25,000	To ensure correct recording of invoices and other periodic expenses (including payroll advised by Treasury), accruals, maintenance of invoice register and ensure proper follow-up of invoice approvals .
	Legal Manager	Euro 20,000 t-o 30,000	Euro 20,000 - 30,000	To provide interpretive and consultancy, guidance and operational support on legal matters and contracts, in compliance with applicable national, international and company regulations.
	HSE Coordinator	Euro 13,000 - 15,000	Euro 13,000 - 15,000	To coordinate/Supervise HSE Management System Requirements. Management of a small team of HSE professionals to supports the achievement of HSE Objectives and fulfilment of HSE requirements and responsibilities.
	ICT Manager	Euro 20,000 - 25,000	Euro 20,000 - 25,000	To be responsible for the alignment and compliance of ICT policies, procedures, processes and controls in tight cooperation with ICT units in line with the corporate document.
	Reservoir Geologist	Euro 10,000 - 11,000	Euro 10,000 - 11,000	To evaluate hydrocarbon potential, assessing well locations, determining well requirements and data acquisition procedures, and to construct integrated geocellular models.

C.2 Decision trees combined

The recommendation for presenting the collective decision trees of all job roles over multiple years is shown in Flowchart C-1.



Flowchart C-1: Combining the decision trees of multiple job roles over multiple year

C.3 Succession plan for expatriate job roles

Eni Ghana has needed to be flexible with the required experience for job roles to enable Ghanaians to replace expatriates in accordance with LI-2204. This section provides an explanation about how Eni Ghana will localise four of the five job roles to meet localisation quotas.

ECU have created personalised training and development plans for each Ghanaian. Training and experience provided for Ghanaians takes place locally and internationally.

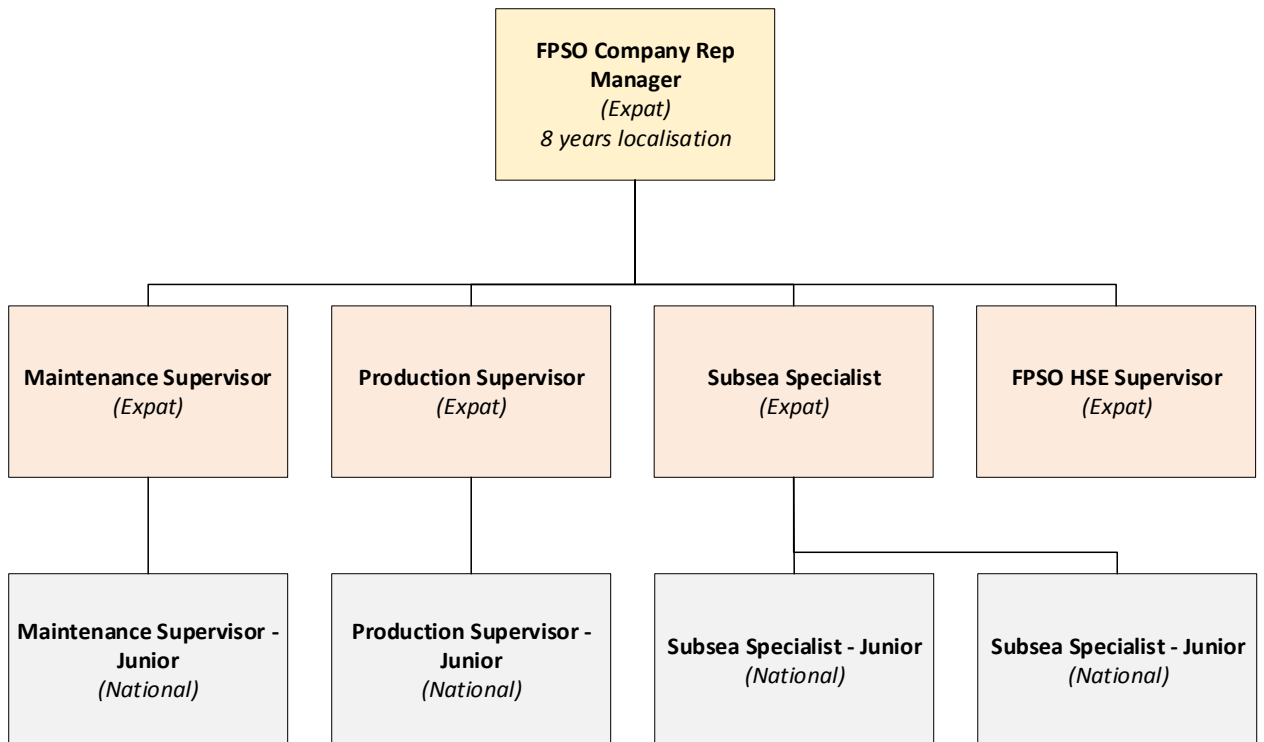
Eni Ghana currently have Ghanaian employees who are working in Italy for up to two years. Whilst building their experience, the individuals stay within their 'professional family' group. Having experience with the 'professional family' in Italy is fundamental to their development. It is an opportunity to work with subsidiaries globally, in order to understand the culture of Eni and to learn about Eni's activities worldwide.

This provides experience in that job function. As part of the plan, each individual must have one year abroad and then return to Ghana to do the same role. There are 'national pathways' for each role, which the career pathway to enable each expatriate role to be replaced by a Ghanaian.

The Eni Ghana recruitment team have faced the challenge of local people not having sufficient experience for job roles. As such Eni Ghana has capitalised on young graduates, with the aim to train, develop and mould them for particular job roles.

Role 1: FPSO Company Rep Manager

An eight year localisation plan is expected for a Ghanaian to reach FPSO Company Rep Manager position, as shown in Flowchart C-2. Currently, working below the FPSO Company Rep Manager there are four roles, all of which are currently held by expatriates. Each expatriate has a Ghanaian shadowing them in a junior role for a short term basis until succession is possible. The workload overlaps, allowing the Ghanaians to understand the role.



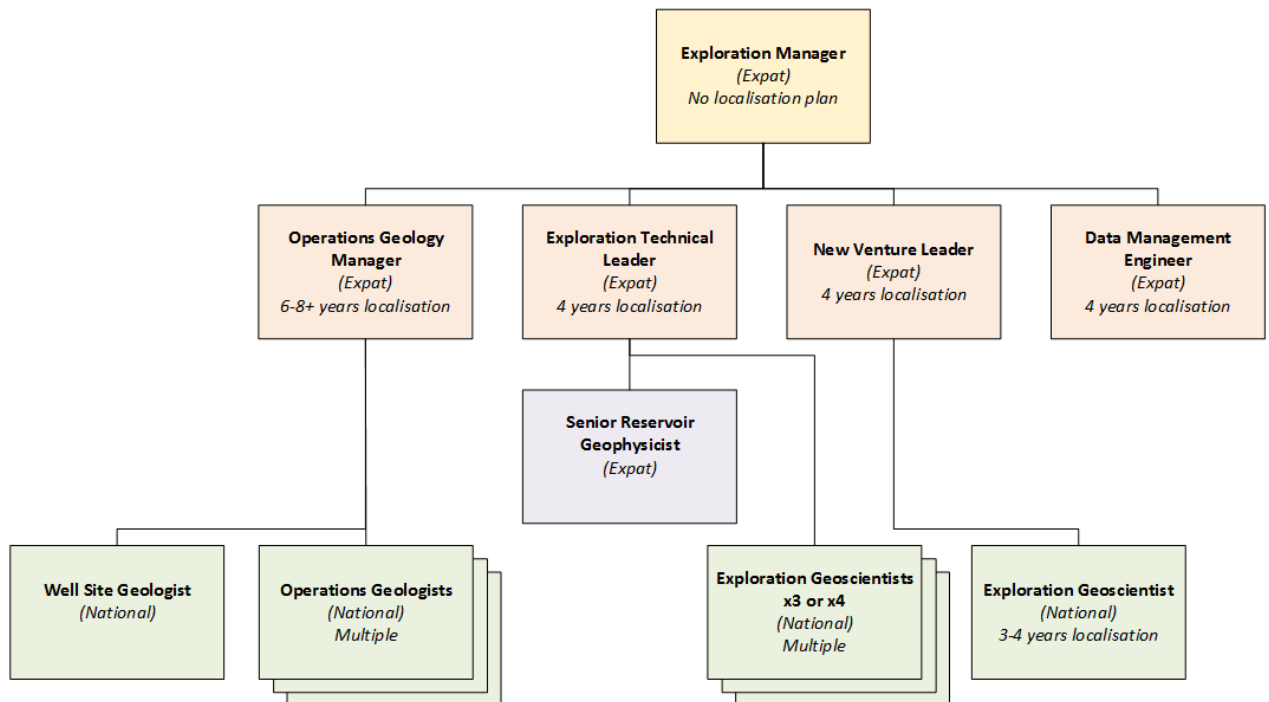
Flowchart C-2: Succession plan for FPSO Company Rep Manager

Role 2: Exploration Manager

Localisation within the exploration department is challenging as certain roles have very high technical skill requirements, as shown in Flowchart C-3. Notably the exploration manager role is not expected to be localised. By maintaining the exploration manager as an expatriate Eni Ghana expect to keep within the required localisation quotas.

For the Data Management Engineer role for example, Eni Ghana put out adverts in the newspaper, but there was nobody in Ghana with the right capabilities. The role requires both IT and Geology experience. Currently a Ghanaian with overlapping skillsets is undertaking an accelerated training programme in Milan with the objective localise the role within four years.

Several Ghanaians have already been employed within the exploration department for two to three years already.

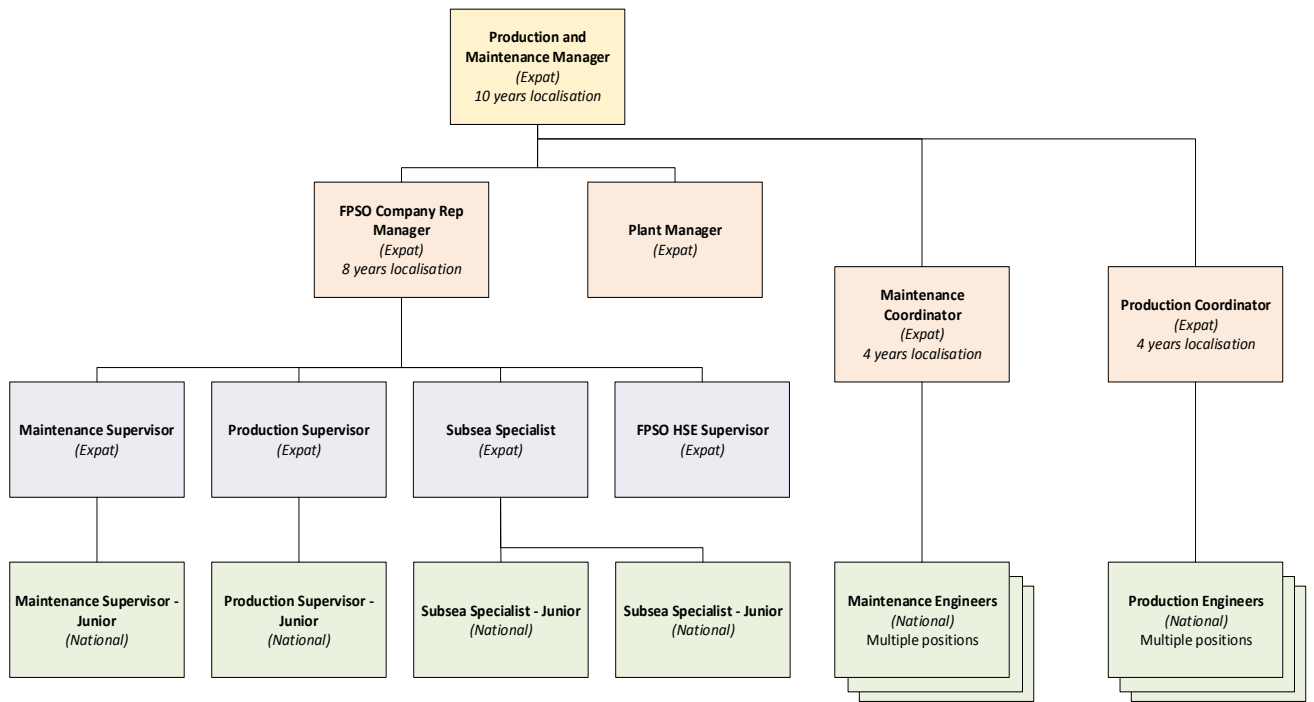


Flowchart C-3: Succession plan for Exploration Manager

Role 3: Production and Maintenance Manager

The Production and Maintenance Manager has four direct reports, two of which are considered more senior, as shown in Flowchart C-4. The two less senior roles have Ghanaian engineers as junior understudies.

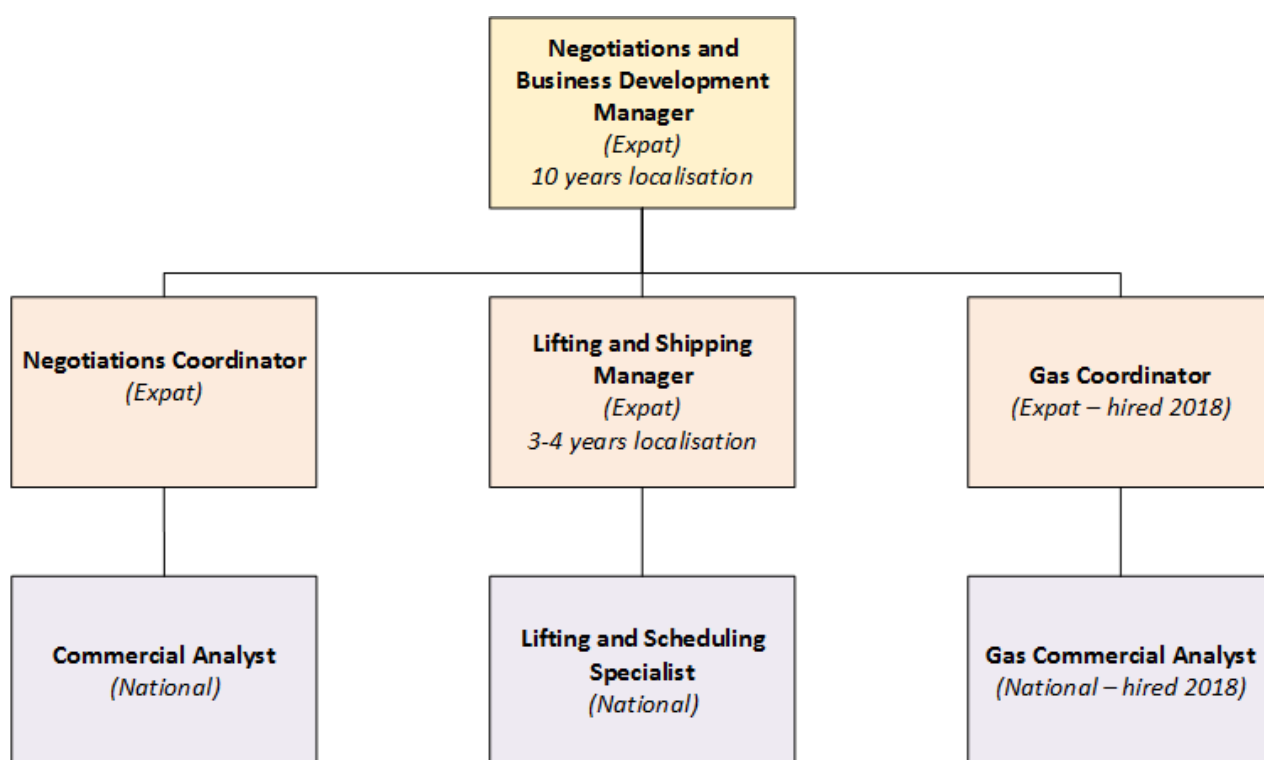
Ghanaian engineers were recruited and grouped into maintenance and production positions. For example, in 2016 the production engineers were recruited and sent to Pakistan, Milan and the UK for training and development. Recently they returned to Ghana. They are now all back, but benefited from field experience. These engineers will replace the coordinators within four years.



Flowchart C-4: Succession plan for Production and Maintenance Manager

Role 4: Negotiations and Business Development Manager

The Negotiations and Business Development Manager role will take approximately ten years to localise, as shown in Flowchart C-5. There is one Ghanaian who has been within the department for approximate four years. The Gas Coordinator role will be hired in 2018 when gas comes on stream which will be held by an expatriate. The Lifting and Shipping Manager role will be localised within three to four years.



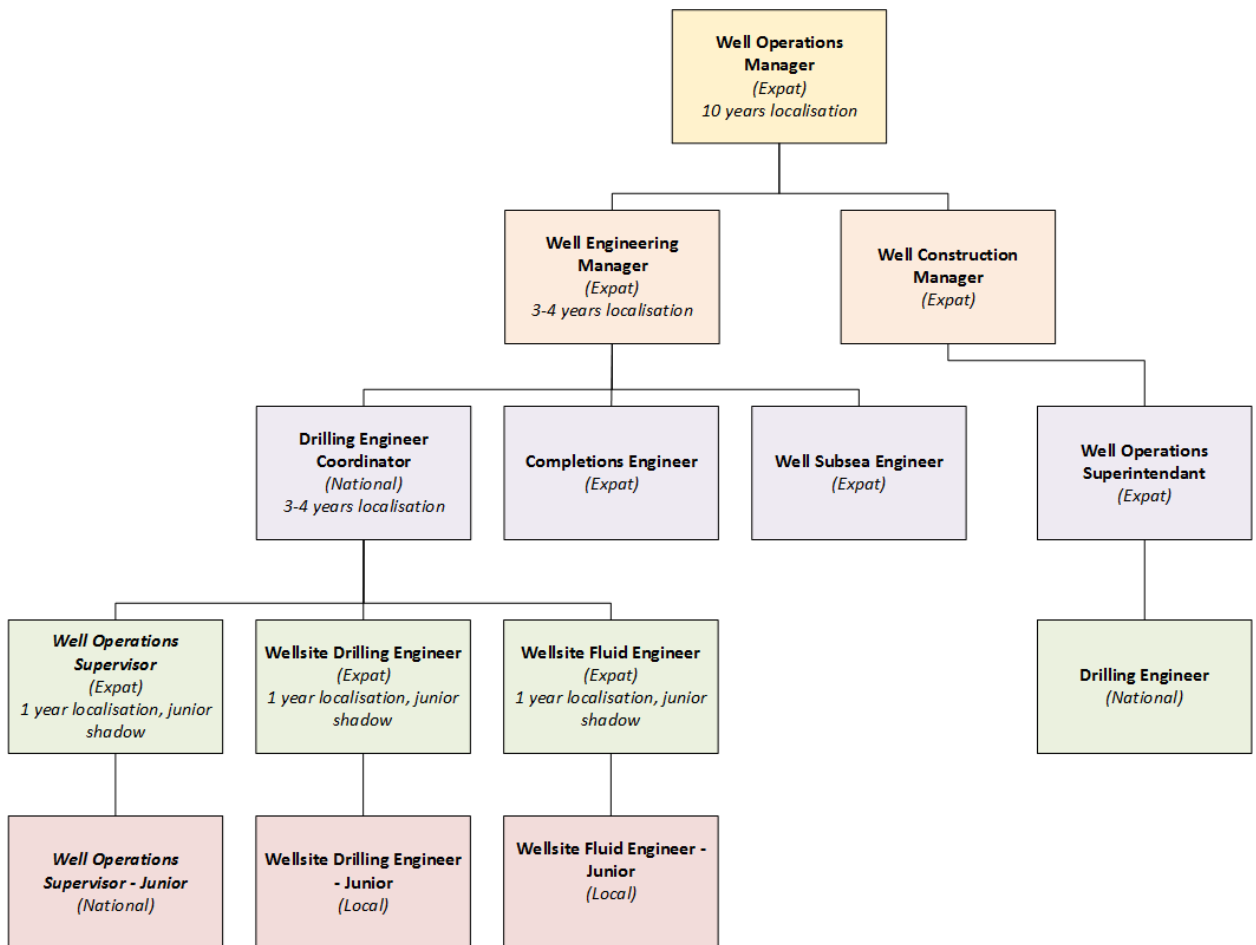
Flowchart C-5: Succession plan for Negotiations and Business Development Manager

Role 5: Well Operations Manager

The Well Operations Manager role has a four step 'national pathway' to achieve JRL, which requires a long term localisation plan, as shown in Flowchart C-6.

The expatriates are all in management roles, all with Ghanaians shadowing directly in junior roles. For example the aim is for the Junior Wellsite Engineer to replace the expatriate within one year.

The Ghanaians have been in Milan for training and development, and have now returned to Ghana. They are currently shadowing and now need On-the-job training. It will take one year to localise these roles to the coordinator positions, which Eni describe as a 'medium term' plan. There are seven Ghanaians within the well operations department. The aim is to push the most talented to the top within the shortest time frame possible.



Flowchart C-6: Succession plan for Well Operations Manager

C.4 Screenshots of each stage in the decision tree

The following Appendix includes screenshots (Figures C-1 to C-36) from each of the principal stages of the decision tree included in Table C-3. For the screenshots titled 'xb' this refers to the chance node of whether there is a local person available with the required competencies to fulfil that category of decision.

Table C-3: Principal categories for the decision tree

Stage	Detail	Node type
1	Job role	Decision
2	Position contract type	Decision
3	Number of positions at any one point	Decision
4	LI2204 - Functional role level	Decision
5	When is the position required?	Chance
6	% of positions taken within expatriate quota	Chance
7	How much does this role affect political risk?	Decision
8	Preference for Expat or Local	Decision
9	Experience required	Decision
10	Offshore or Specialism experience required	Decision
11	Experience with Eni	Decision
12	Education required	Decision
13	Main responsibilities requirements	Decision
14	Management requirements	Decision
15	Internal interface requirement	Decision
16	External interface requirement	Decision
17	HSE Compliance requirement	Decision
18	Knowledge, technical or professional skills requirement	Decision
19	Personal capabilities requirement	Decision
20	Languages requirement	Decision
21	Training and courses requirement	Decision
22	Professional Qualifications requirement	Decision

Nota bene: Please ignore the probabilities, 'TRUE' and 'FALSE' comments included in Figures C-1 to C-36, which are standard with the PrecisionTree software but are not relevant to this logic based decision tree model.

Stage 1: Job role

This stage allows the user to decide which job role to choose from a list of job roles, in Figure C-1.

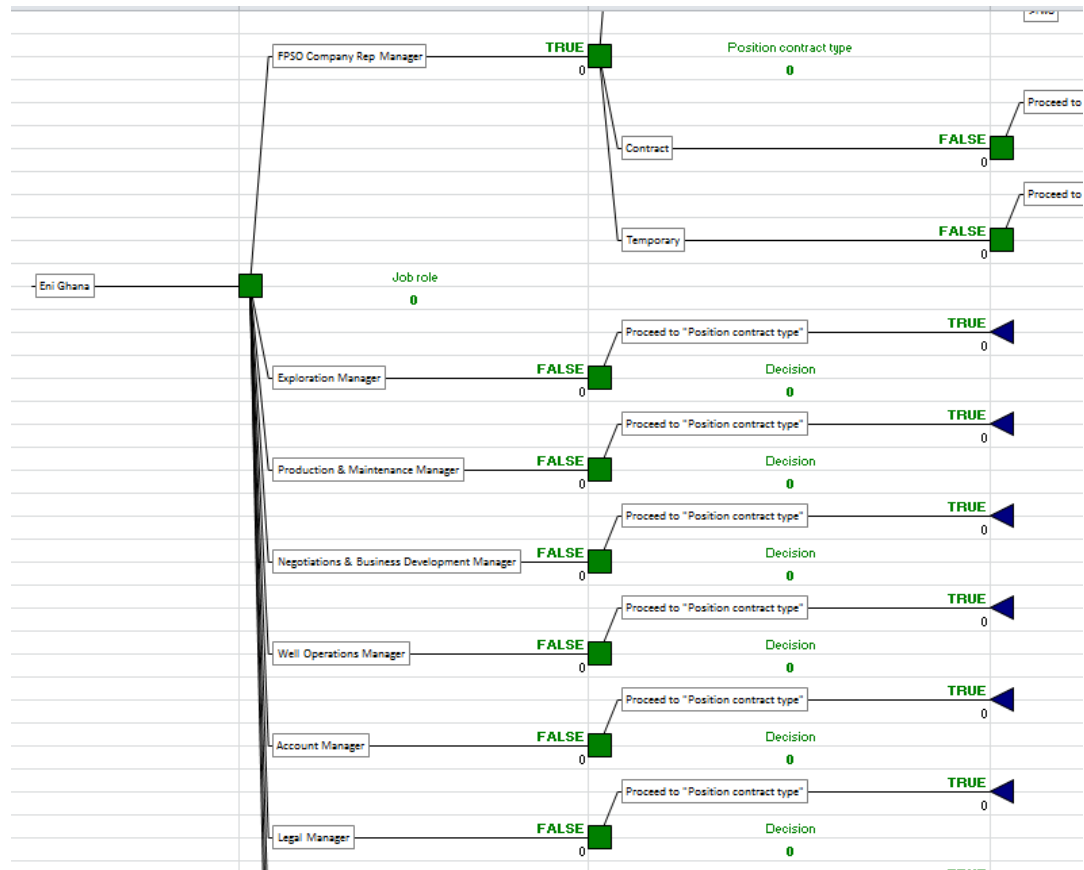


Figure C-1: Stage 1 - Job role

Stage 2: Position contract type

This stage allows the user to decide which type of contract is associated to the position, as contract type impact the localisation requirements, in Figure C-2.

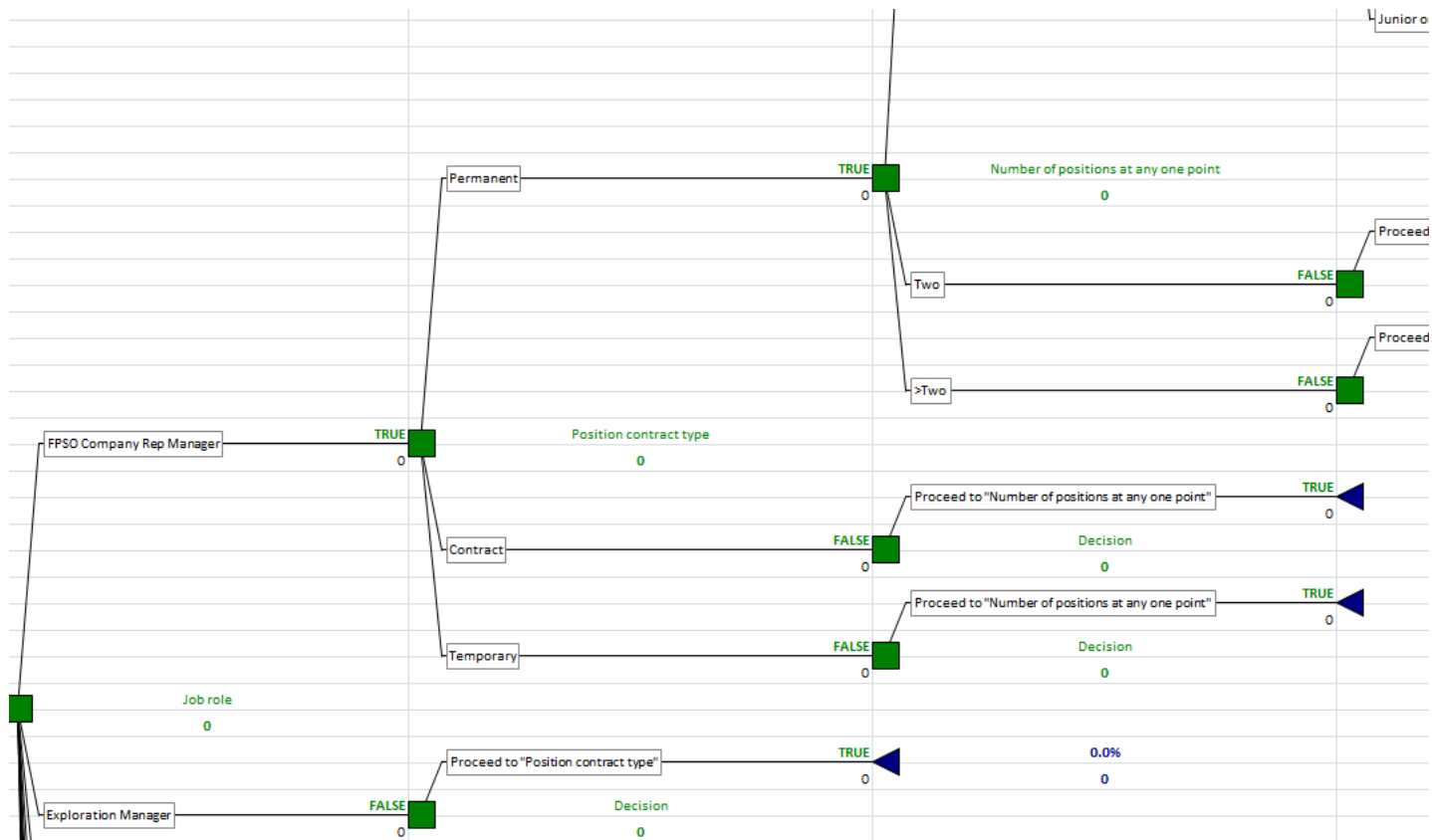


Figure C-2: Stage 2 - Position contract type

Stage 3: Number of positions at any one point

This stage allows the user to decide how many people are required for each job role, in Figure C-3.

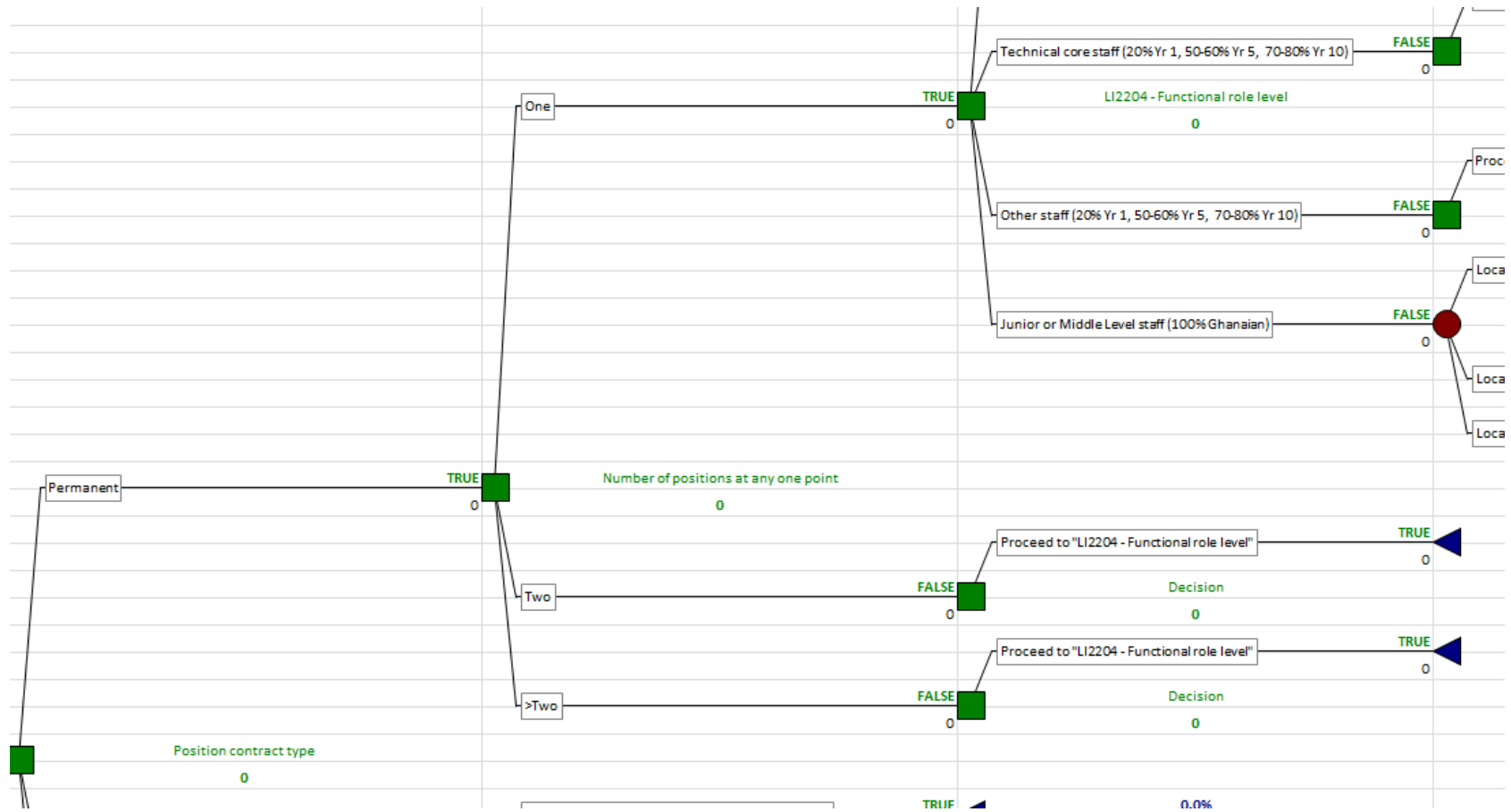


Figure C-3: Stage 3 - Number of positions at any one point

Stage 4: LI2204 - Functional role level

This stage allows the user to decide which functional level the job position fits in, as there are different obligations in the L.I.-2204 depending on functional role level, in Figure C-4.

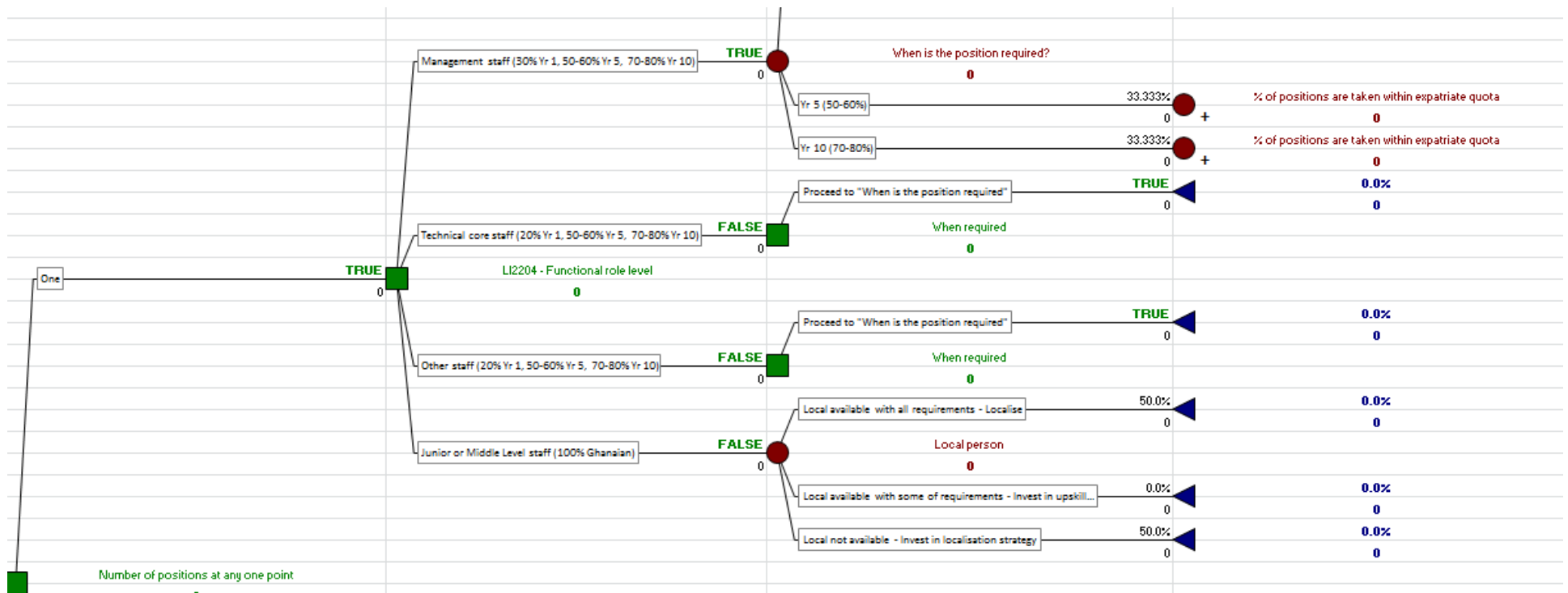


Figure C-4: Stage 4 - LI2204 - Functional role level

Stage 5: When is the position required?

This stage allows the user to decide when the job role is required within the project lifecycle, in Figure C-5. This links to the L.I.-2204 legislation, as there are different obligations from first year of operation to ten years of operation.

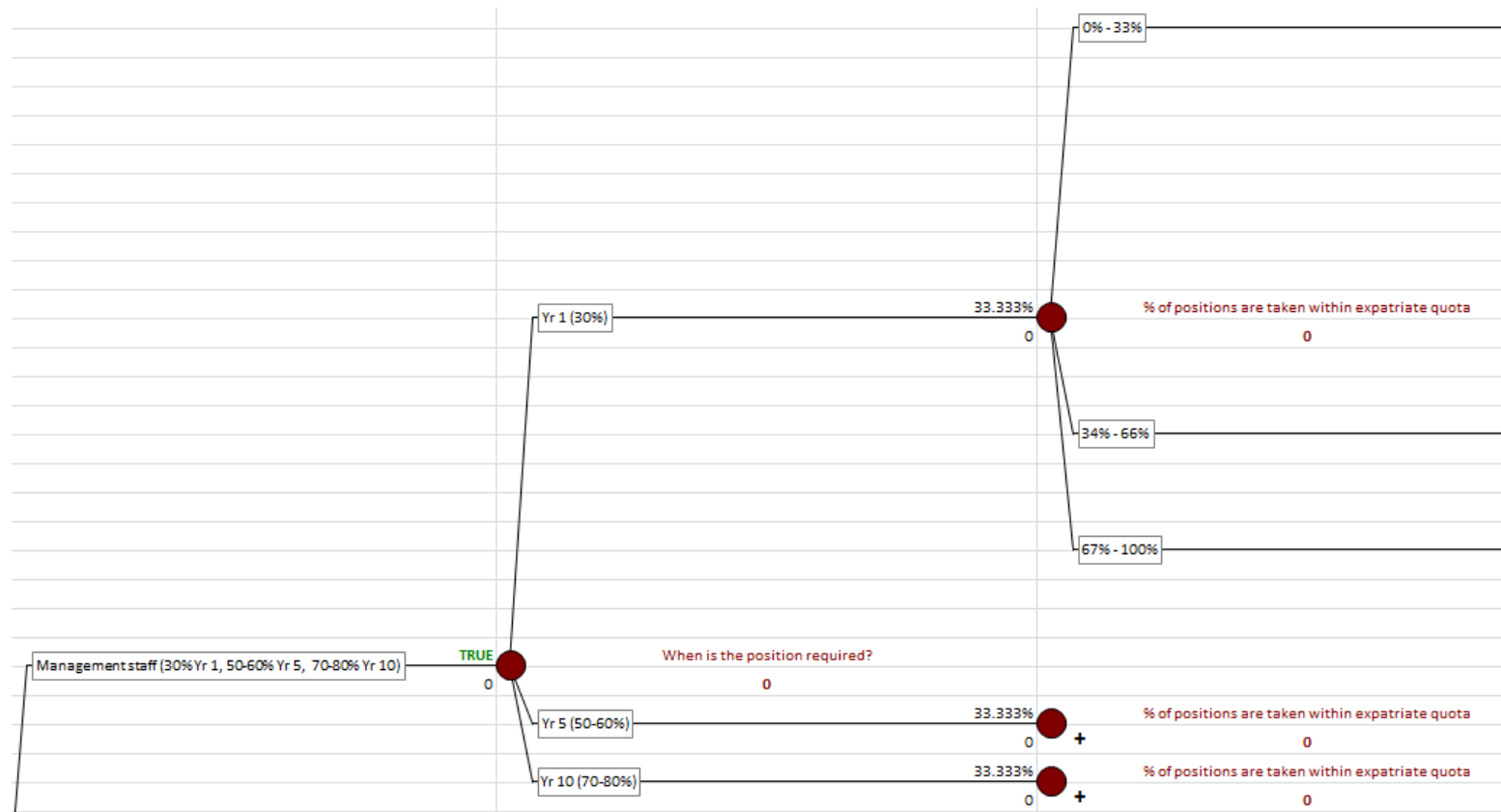


Figure C-5: Stage 5 - When is the position required?

Stage 6: % of positions taken within expatriate quota

This stage allows the user to decide how many positions are already taken within the quota of allowed expatriates, in Figure C-6. If, for example, the expatriate quota is nearing 90% in the tenth year of operation, more pressure would be felt in localising a role.

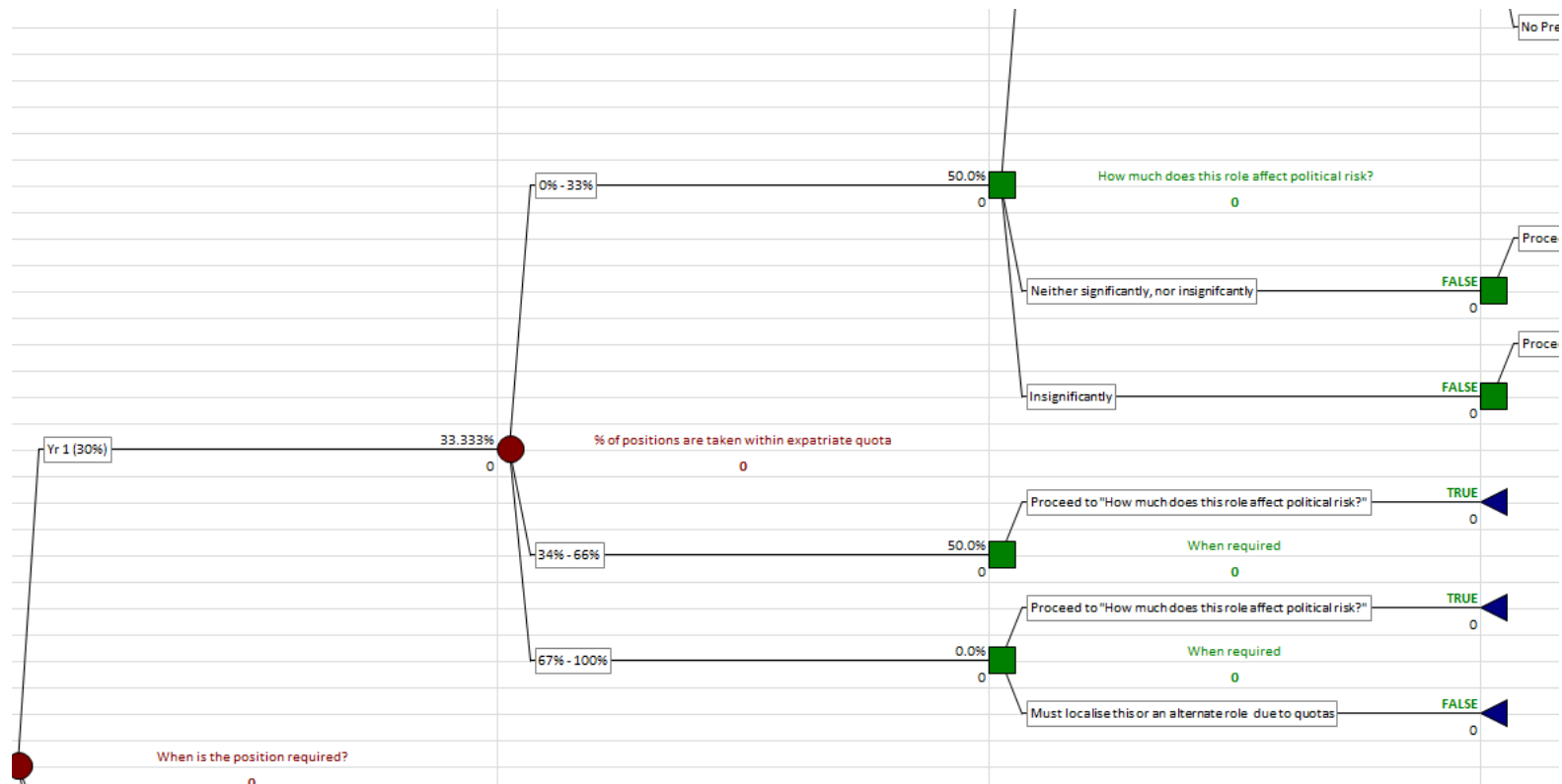


Figure C-6: Stage 6 - % of positions taken within expatriate quota

Stage 7: How much does this role affect political risk?

This stage allows the user to decide how much the job role affects your relationship with government, in Figure C-7. For example if another company has been able to localise a key role such as FPSO Manager within a time frame, the government would ask why this organisation has not been able to.

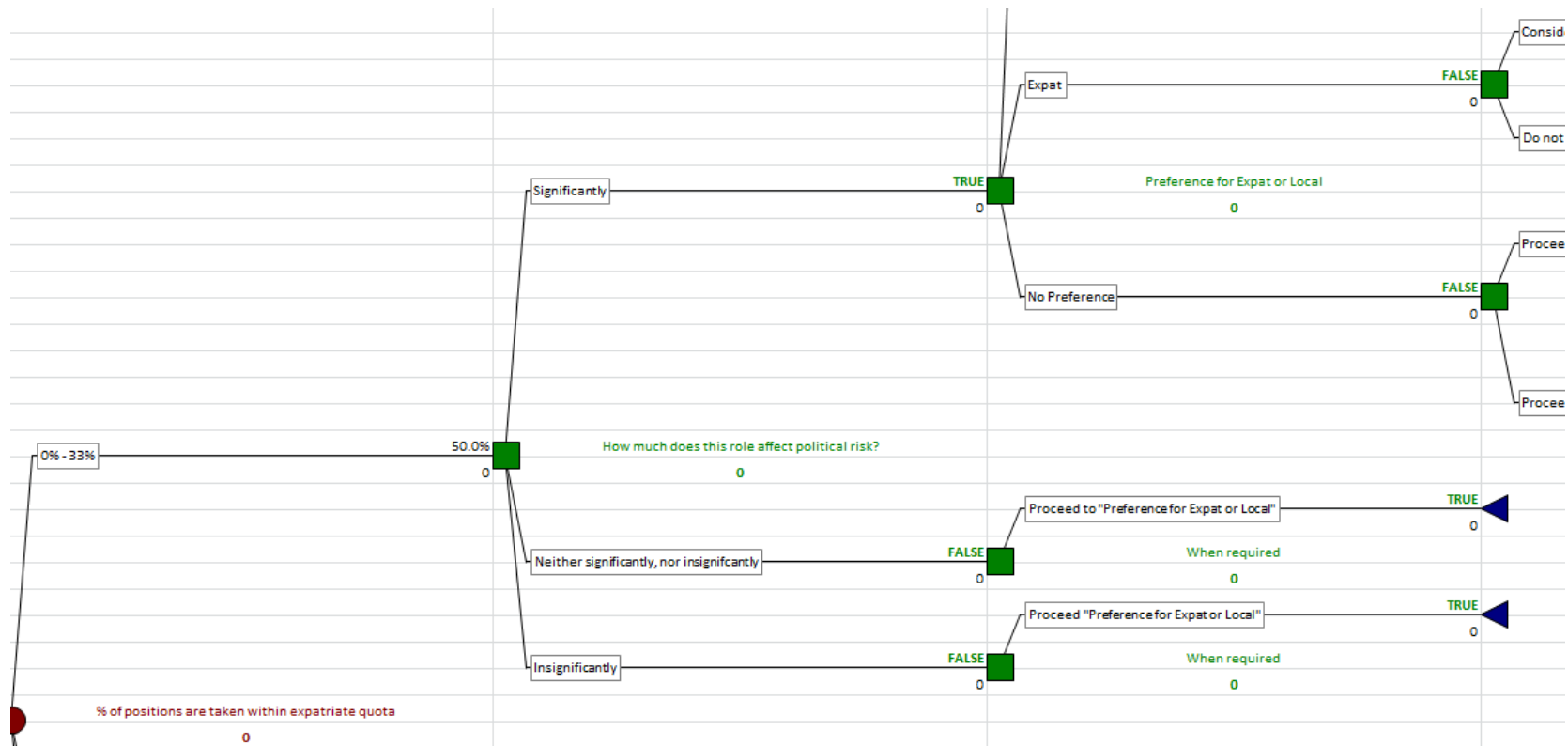


Figure C-7: Stage 7 - How much does this role affect political risk?

Stage 8: Preference for Expat or Local

This stage allows the user to decide whether there is a preference for an expatriate or a local at that particular point in time for a job role, in Figure C-8.

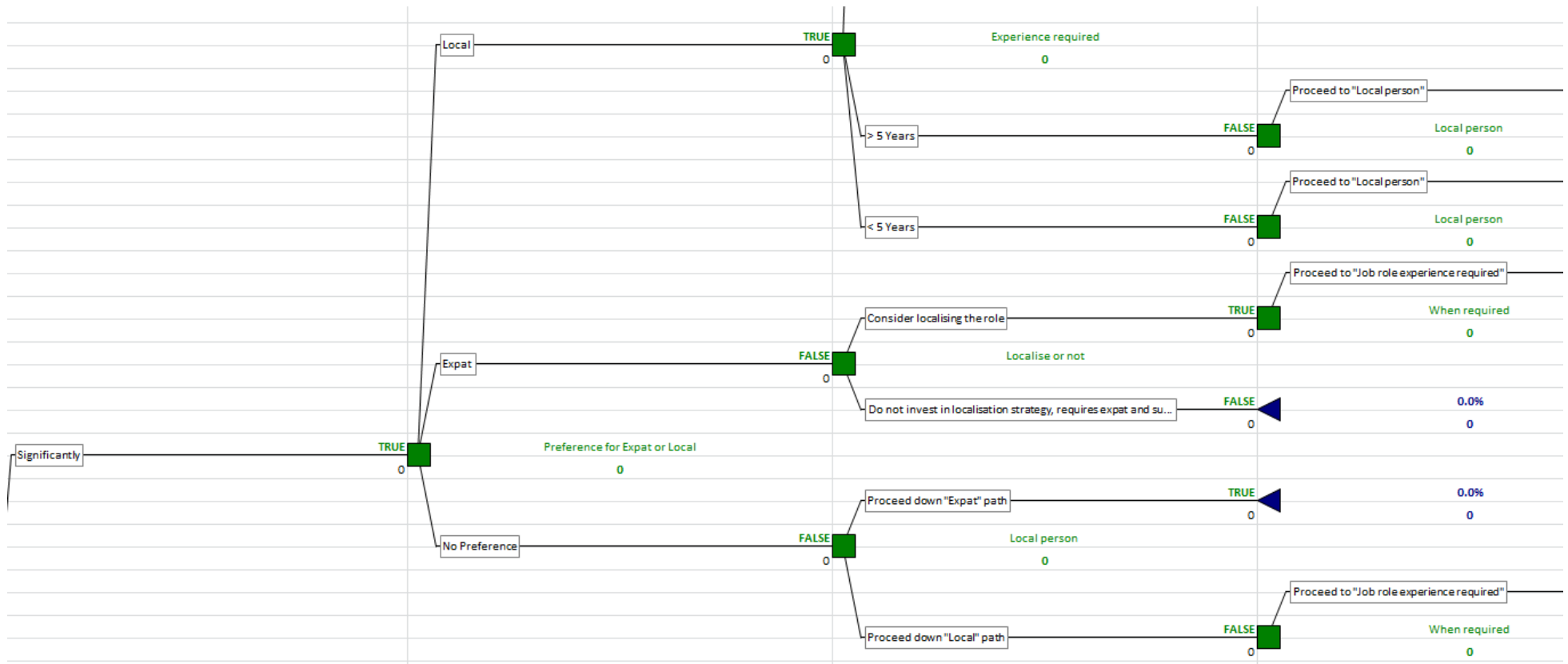


Figure C-8: Stage 8 - Preference for Expat or Local

Stage 9: Experience required

This stage allows the user to decide how much experience is required for that particular job role, in Figure C-9.

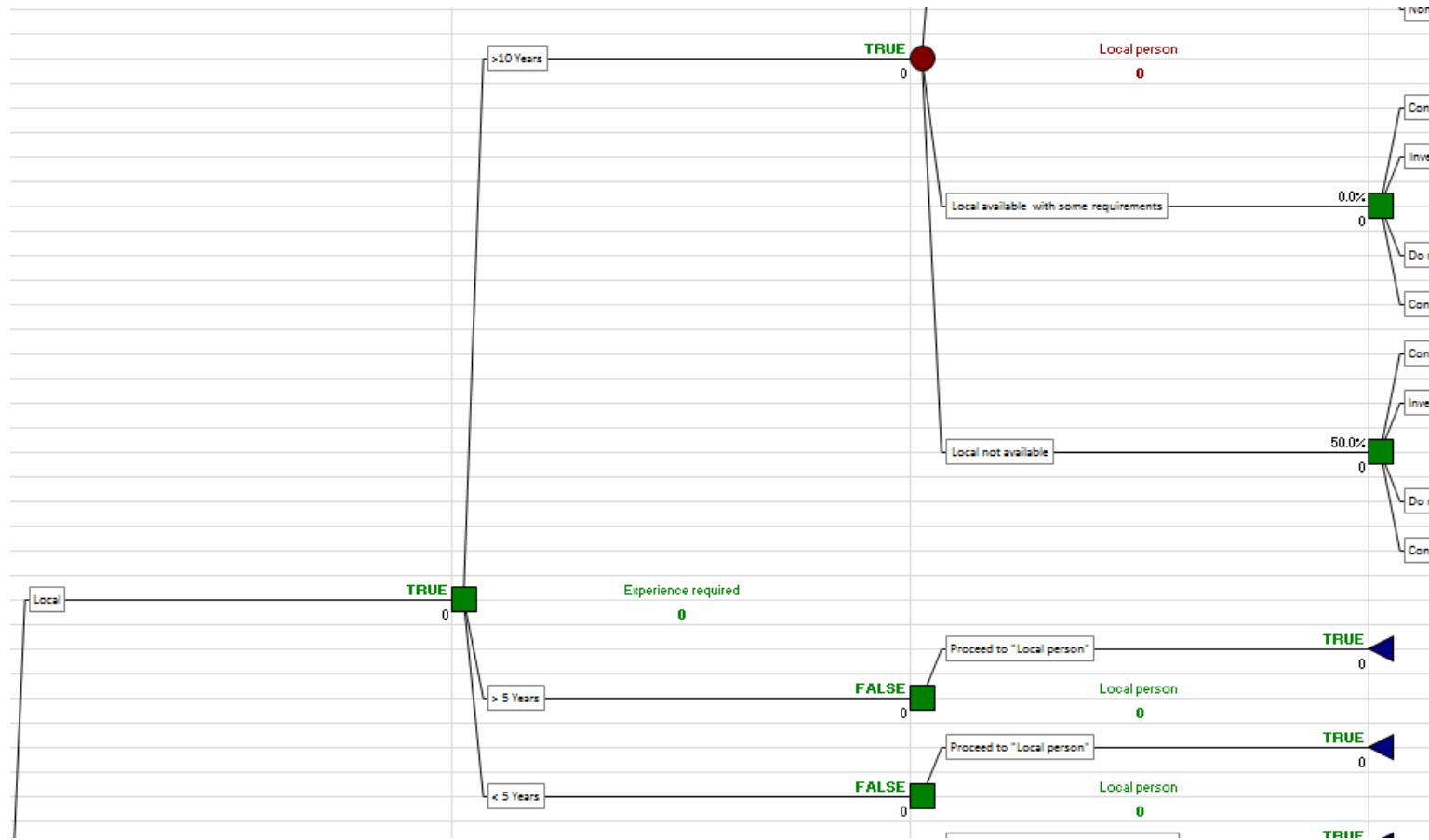


Figure C-9: Stage 9 - Experience required

Stage 9b: Local availability

This stage allows the user to decide whether a local person is available, in Figure C-10.

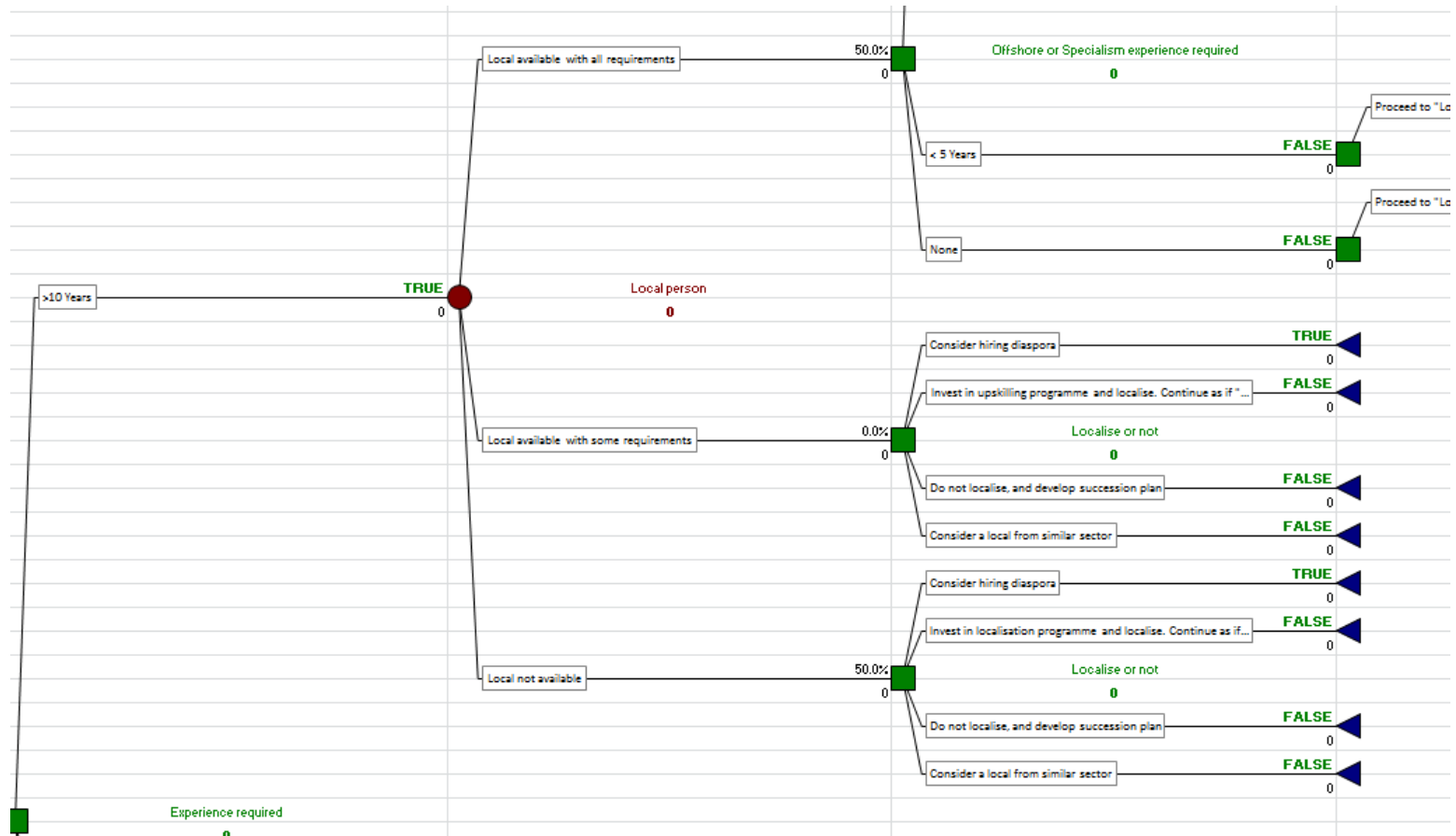


Figure C-10: Stage 9b - Local availability

Stage 10: Offshore or Specialism experience

This stage allows the user to decide how much offshore experience or other specialism experience is required for that particular job role, in Figure C11.

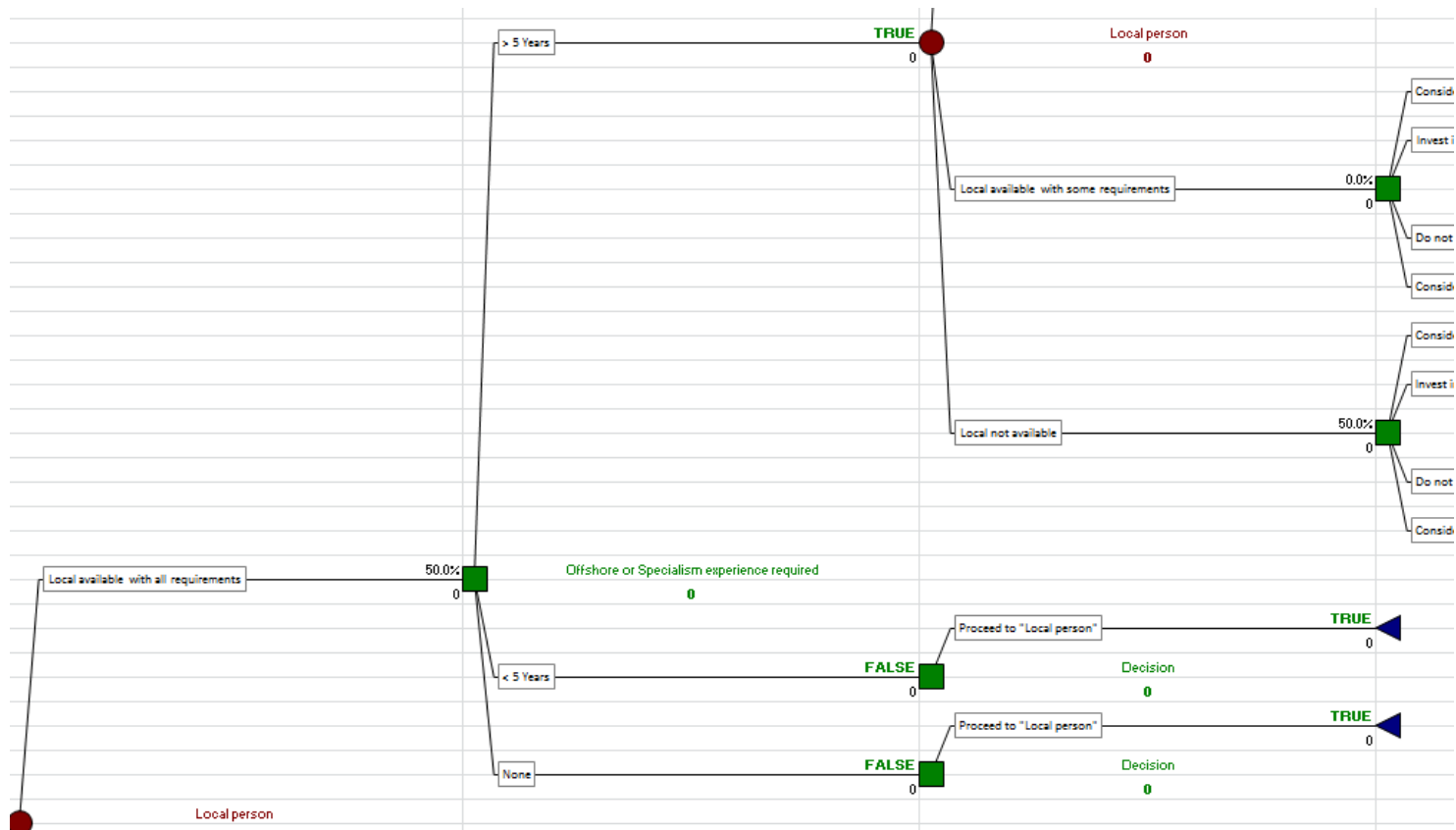


Figure C-11: Stage 10 - Offshore or Specialism experience required

Stage 10b: Local availability

This stage allows the user to decide whether a local person is available, in Figure C-12.

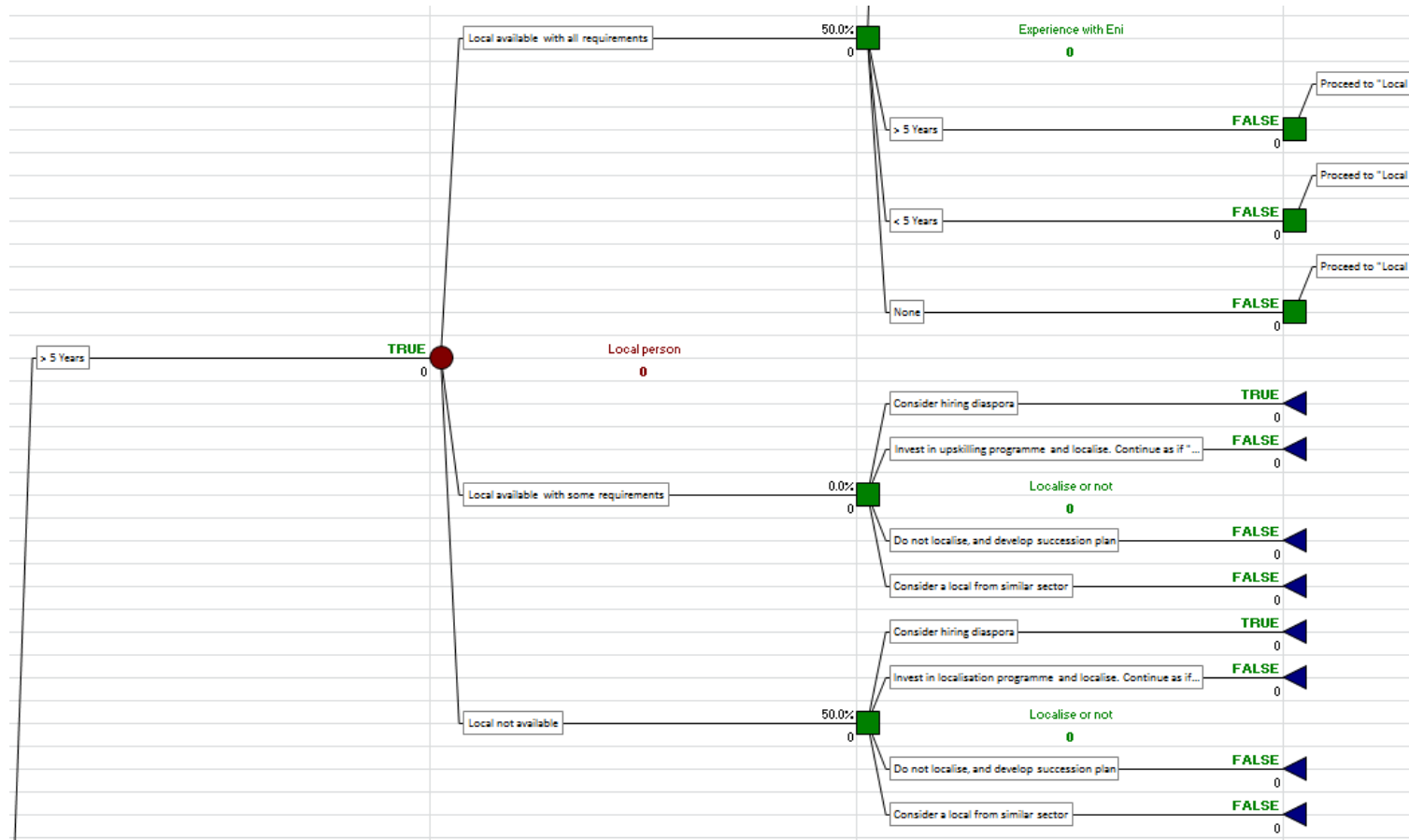


Figure C-12: Stage 10b - Local availability

Stage 11: Experience with Eni

This stage allows the user to decide how much experience is required specifically within Eni for that particular job role, in Figure C-13.

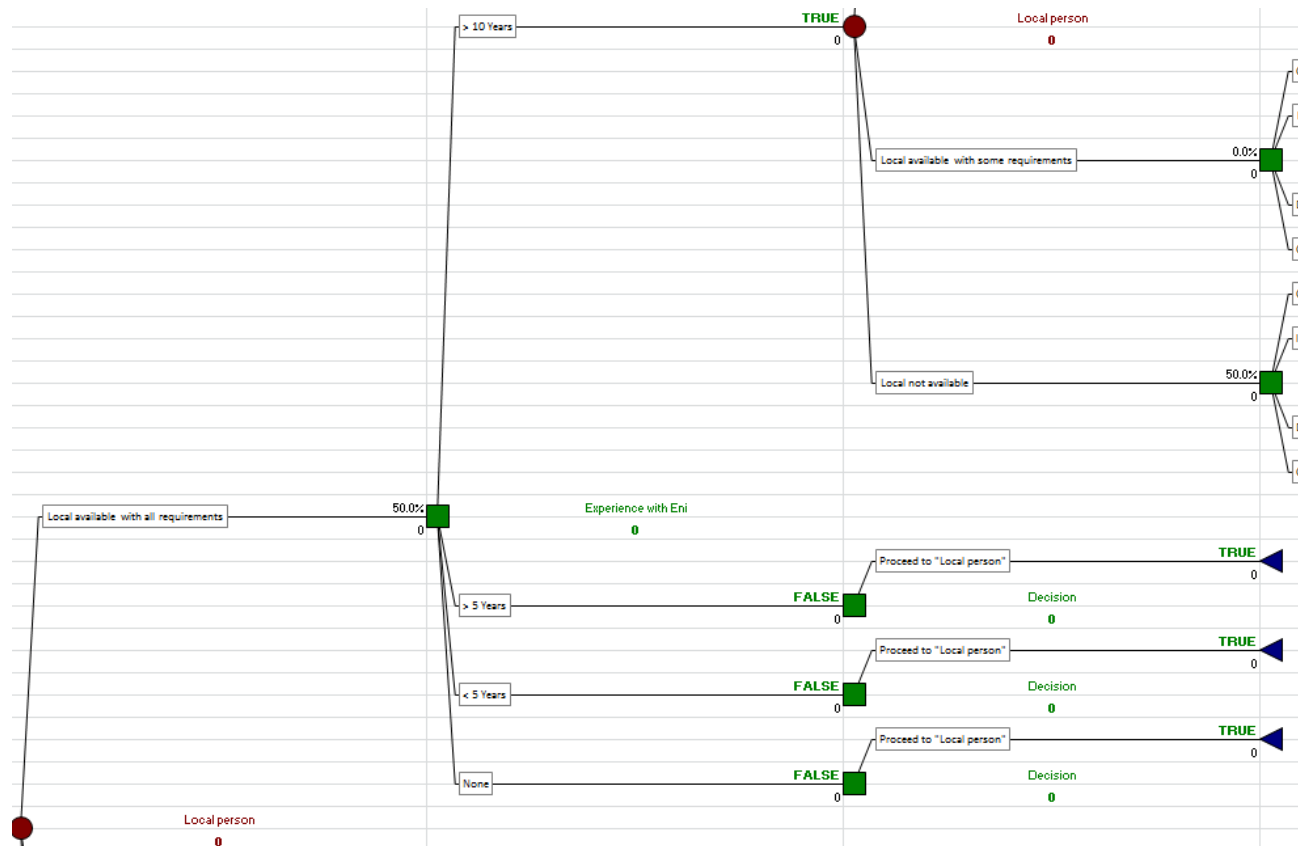


Figure C-13: Stage 11 - Experience with Eni

Stage 11b: Local availability

This stage allows the user to decide whether a local person is available, in Figure C-14.

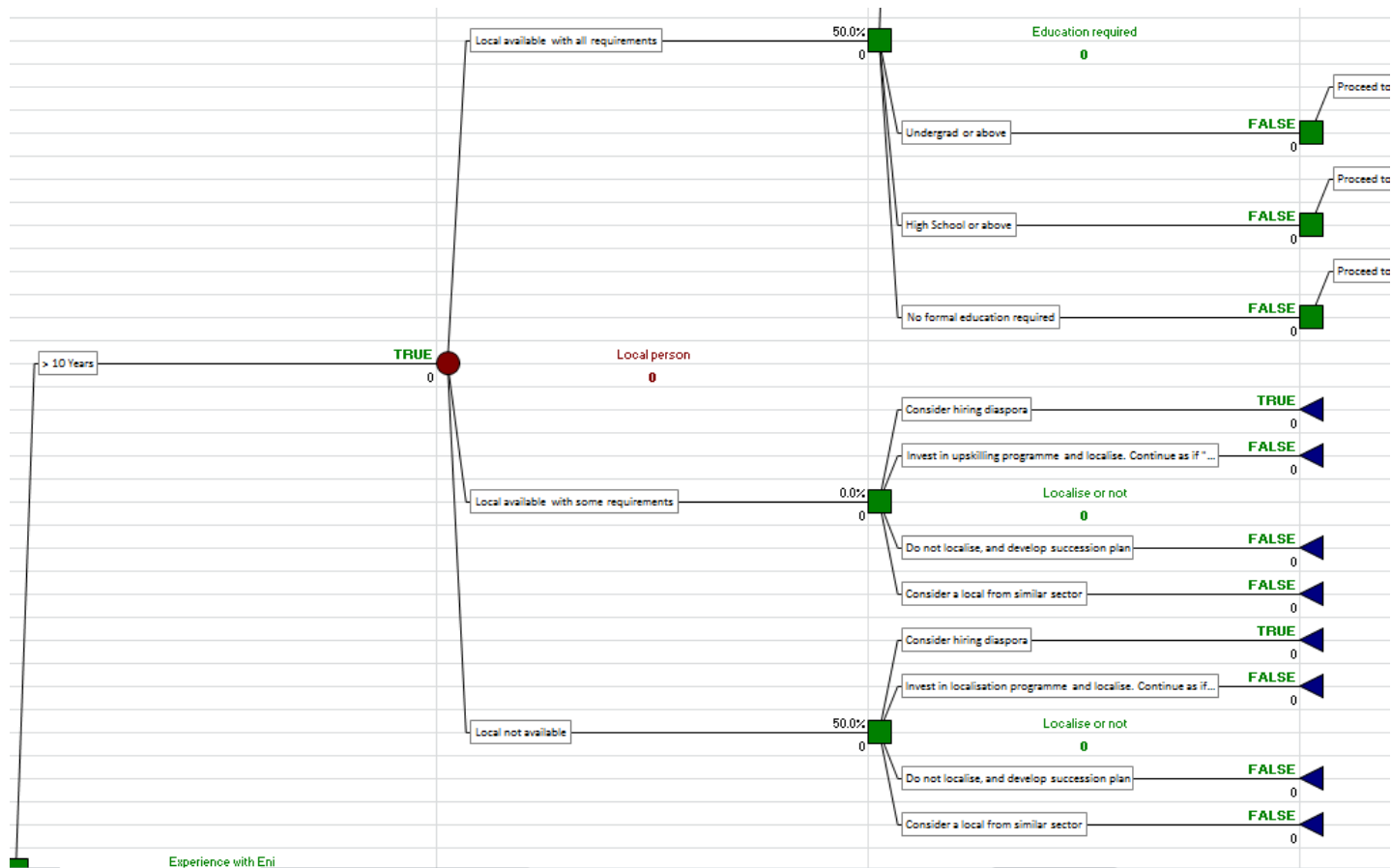


Figure C-14: Stage 11b - Local availability

Stage 12: Education required

This stage allows the user to decide what level of education is required for that particular job role, in Figure C-15.

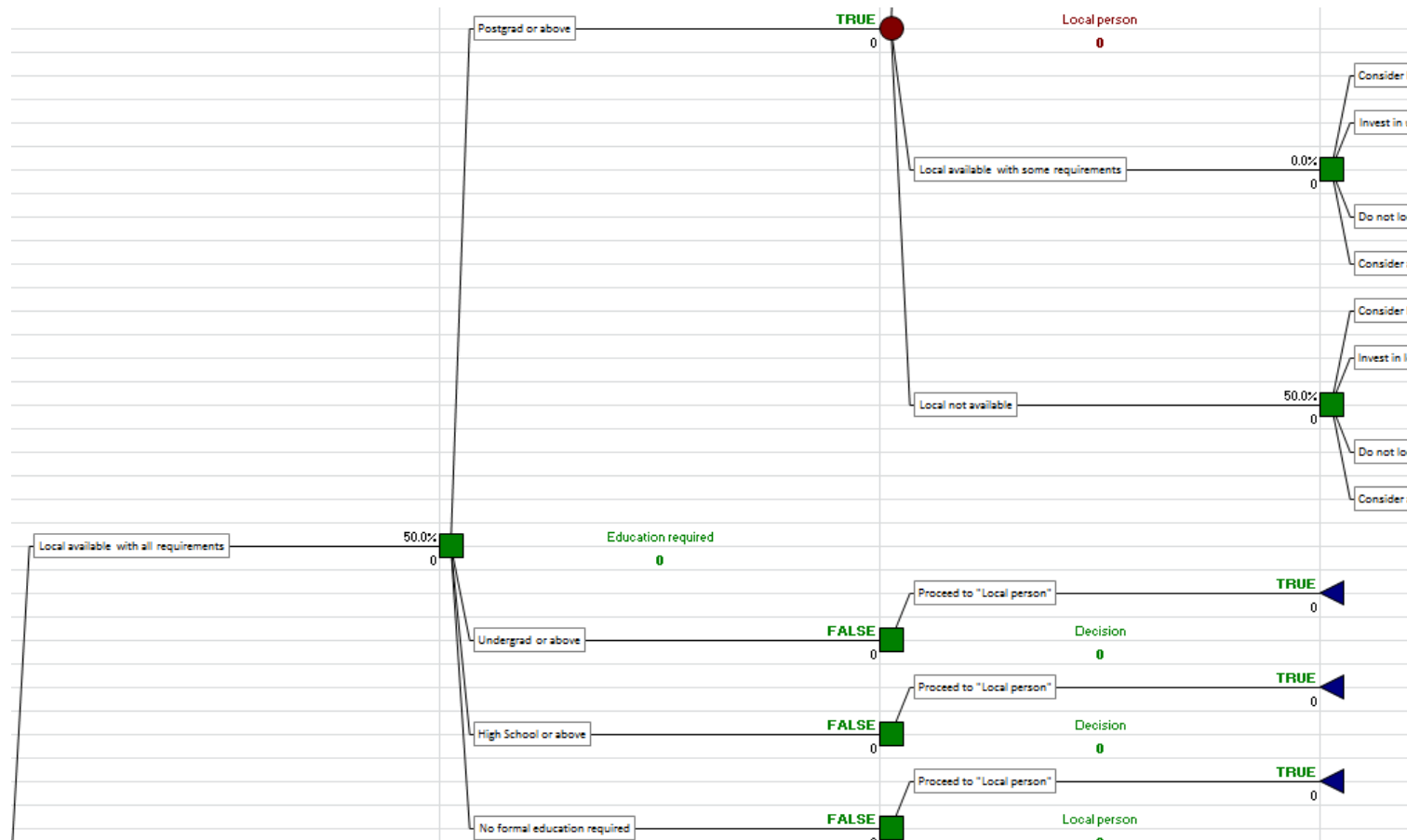


Figure C-15: Stage 12 - Education required

Stage 12b: Local availability

This stage allows the user to decide whether a local person is available, in Figure C-16.

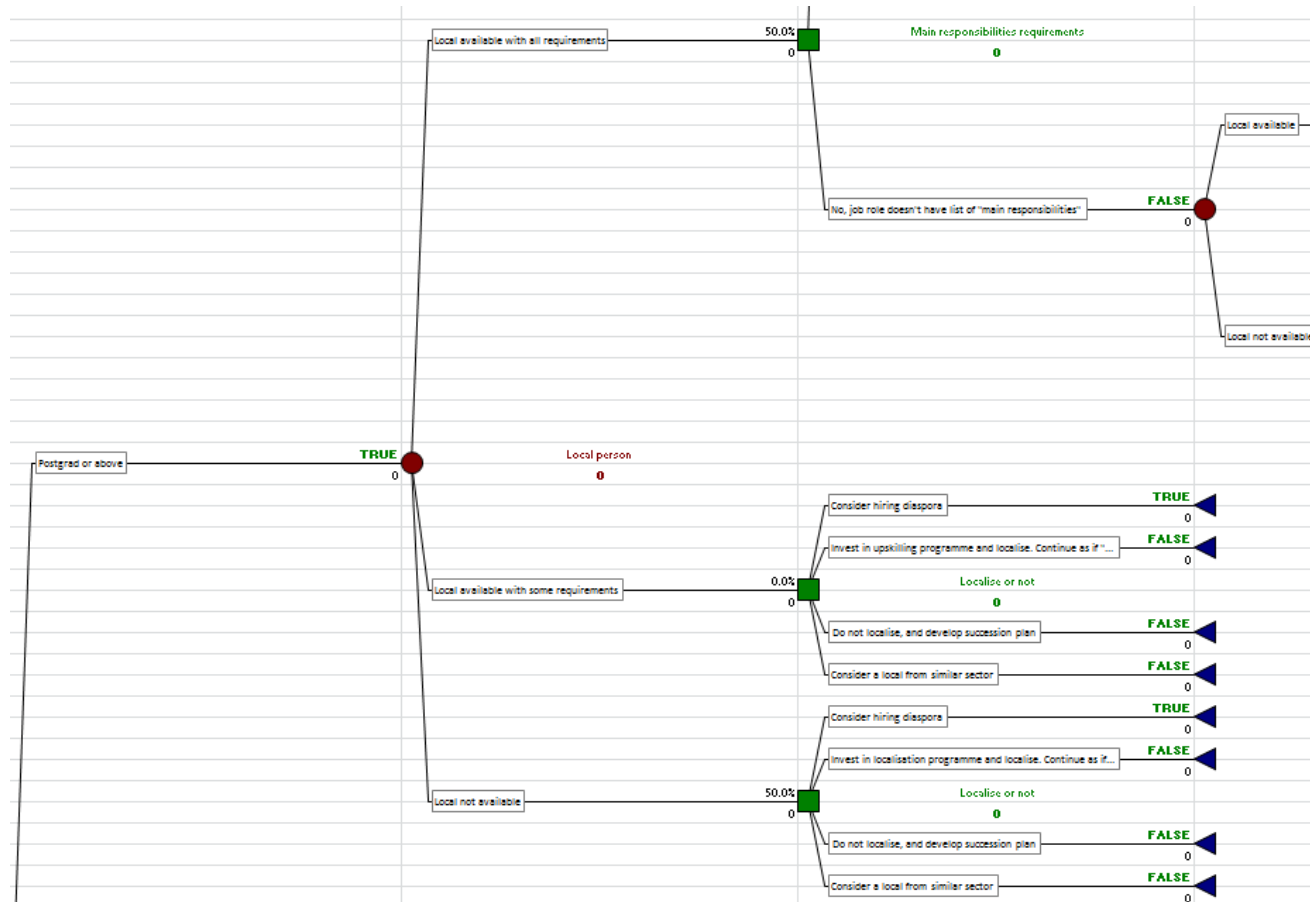


Figure C-16: Stage 12b - Local availability

Stage 13: Main responsibilities requirements

This stage allows the user to decide whether all of the main responsibilities will be fulfilled within that job role, in Figure C-17.

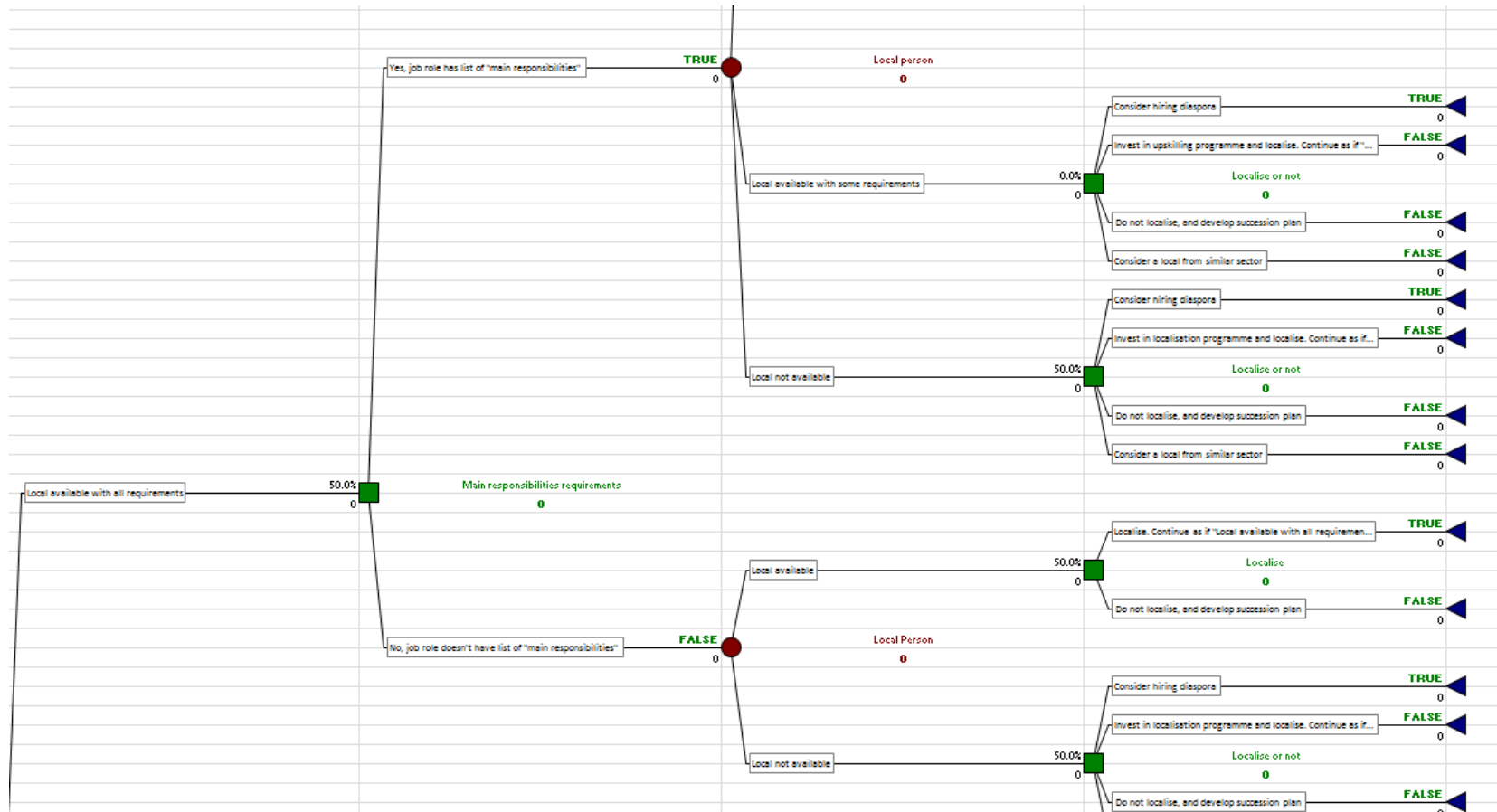


Figure C-17: Stage 13 - Main responsibilities requirements

Stage 13b: Local availability

This stage allows the user to decide whether a local person is available, in Figure C-18.

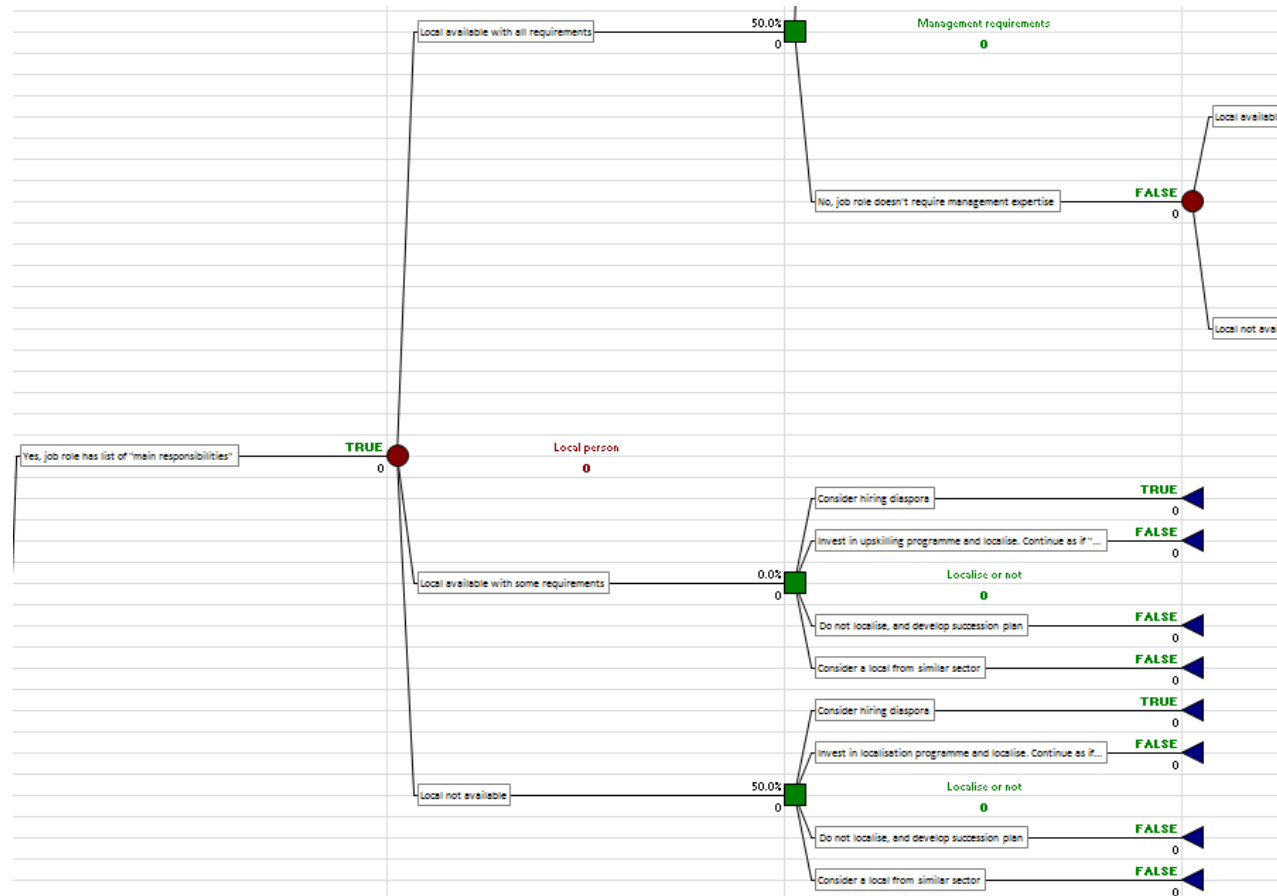


Figure C-18: Stage 13b - Local availability

Stage 14: Management requirements

This stage allows the user to decide whether the requires the management of other people, in Figure C-19.

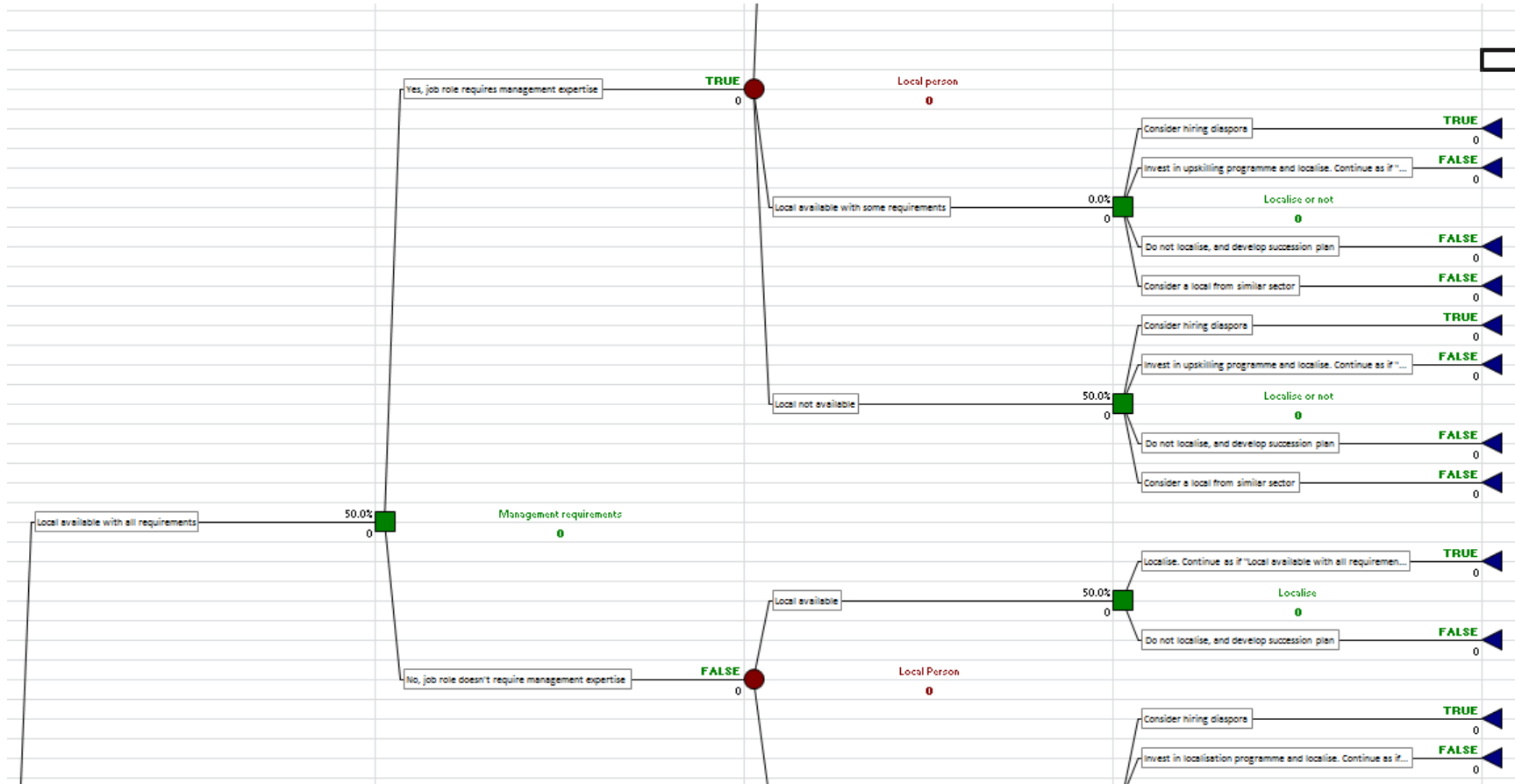


Figure C-19: Stage 14 - Management requirements

Stage 14b: Local availability

This stage allows the user to decide whether a local person is available, in Figure C-20.

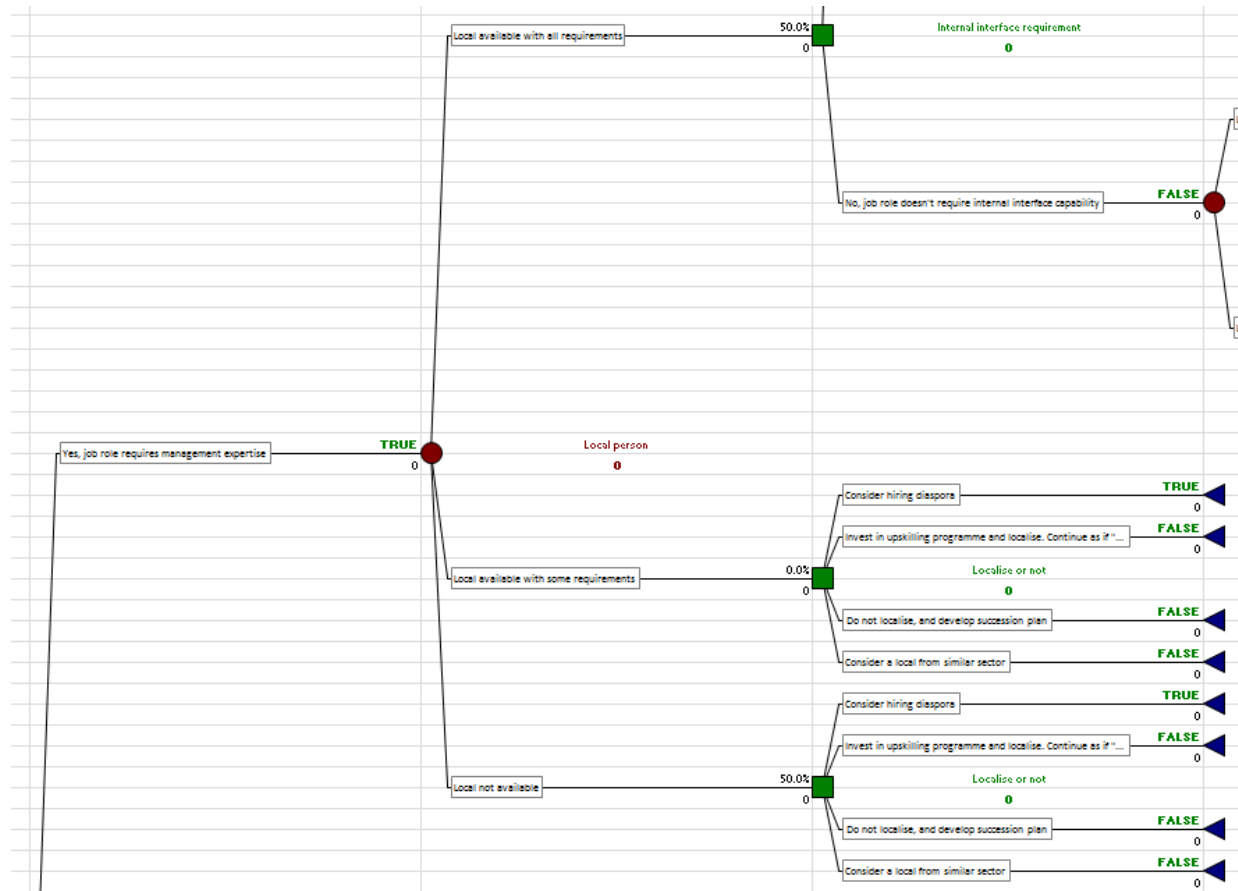


Figure C-20: Stage 14b - Local availability

Stage 15: Internal interface requirement

This stage allows the user to decide whether or not the job requires individuals to have internal interfaces, in Figure C-21.

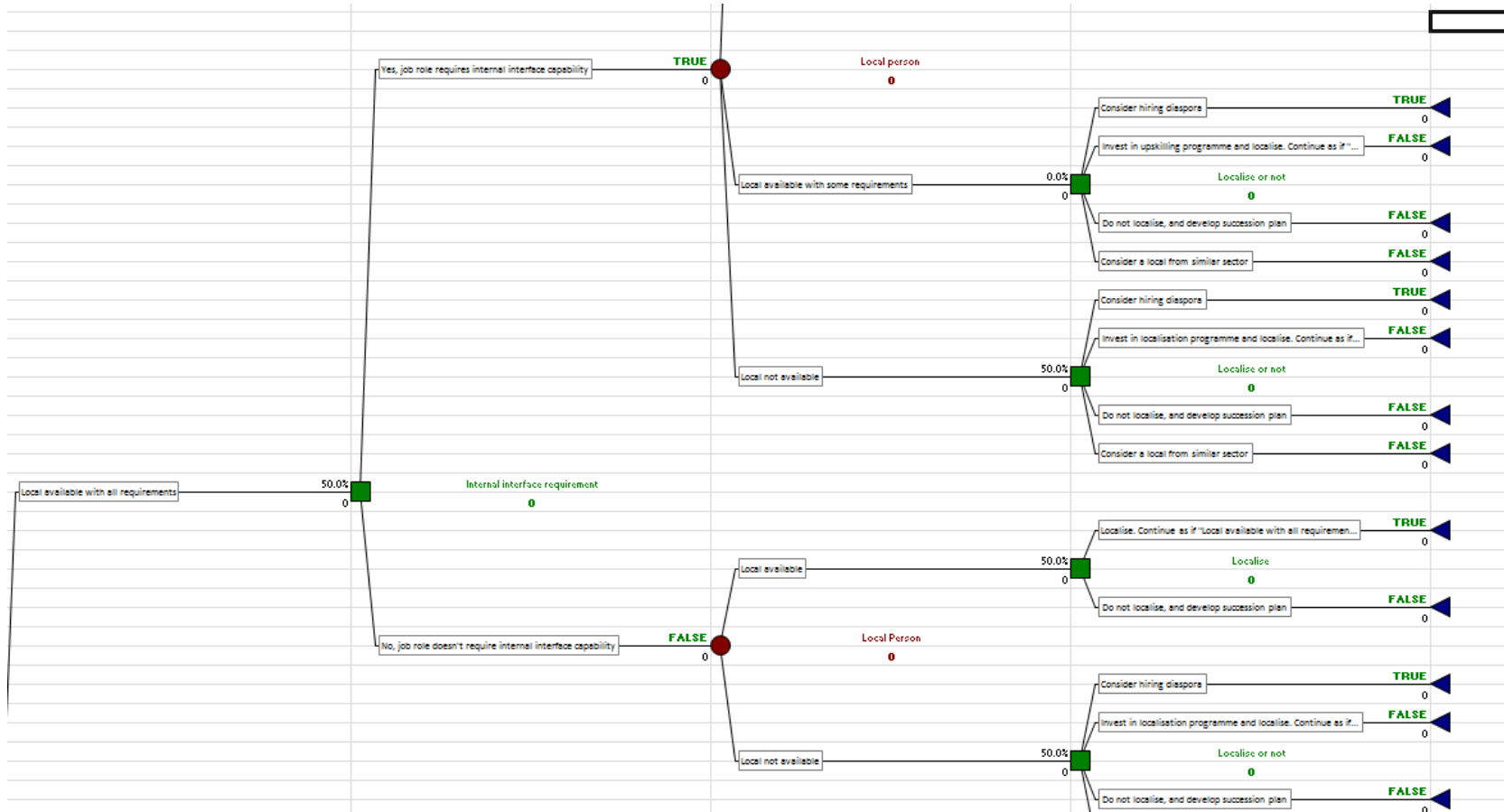


Figure C-21: Stage 15 - Internal interface requirement

Stage 15b: Local availability

This stage allows the user to decide whether a local person is available, in Figure C-22.

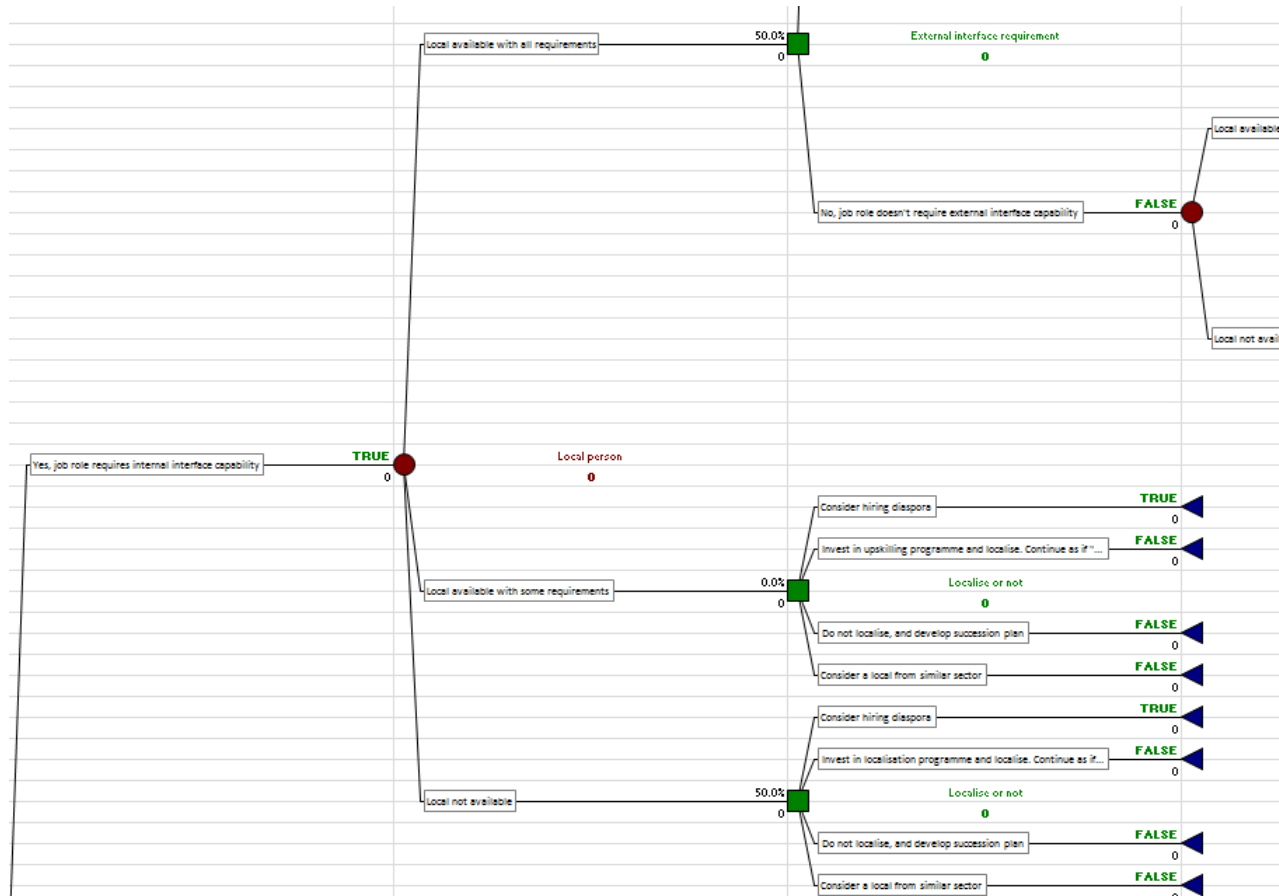


Figure C-22: Stage 15b - Local availability

Stage 16: External interface requirement

This stage allows the user to decide whether or not the job requires individuals to have external interfaces, in Figure C-23.

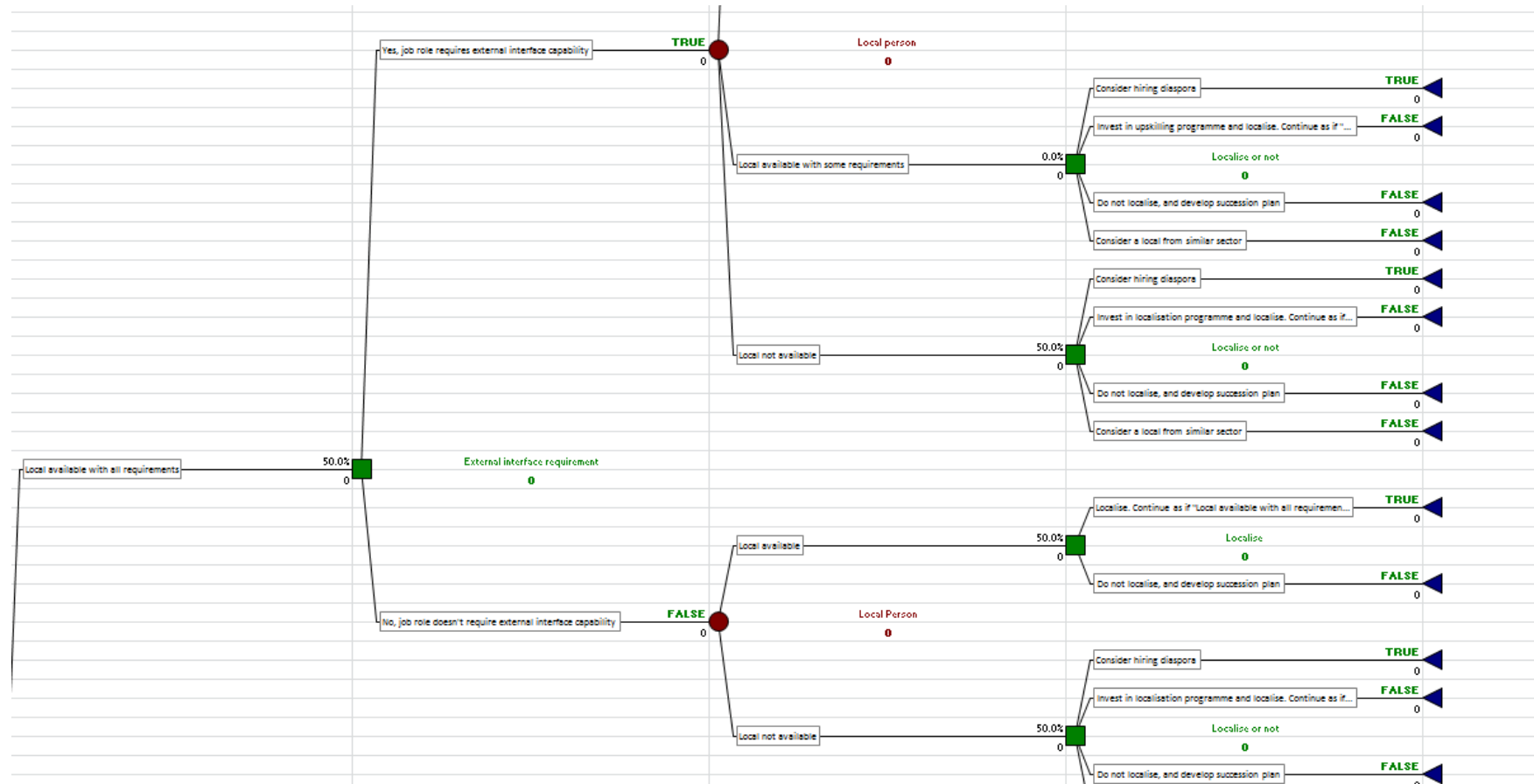


Figure C-23: Stage 16 - External interface requirement

Stage 16b: Local availability

This stage allows the user to decide whether a local person is available, in Figure C-24.

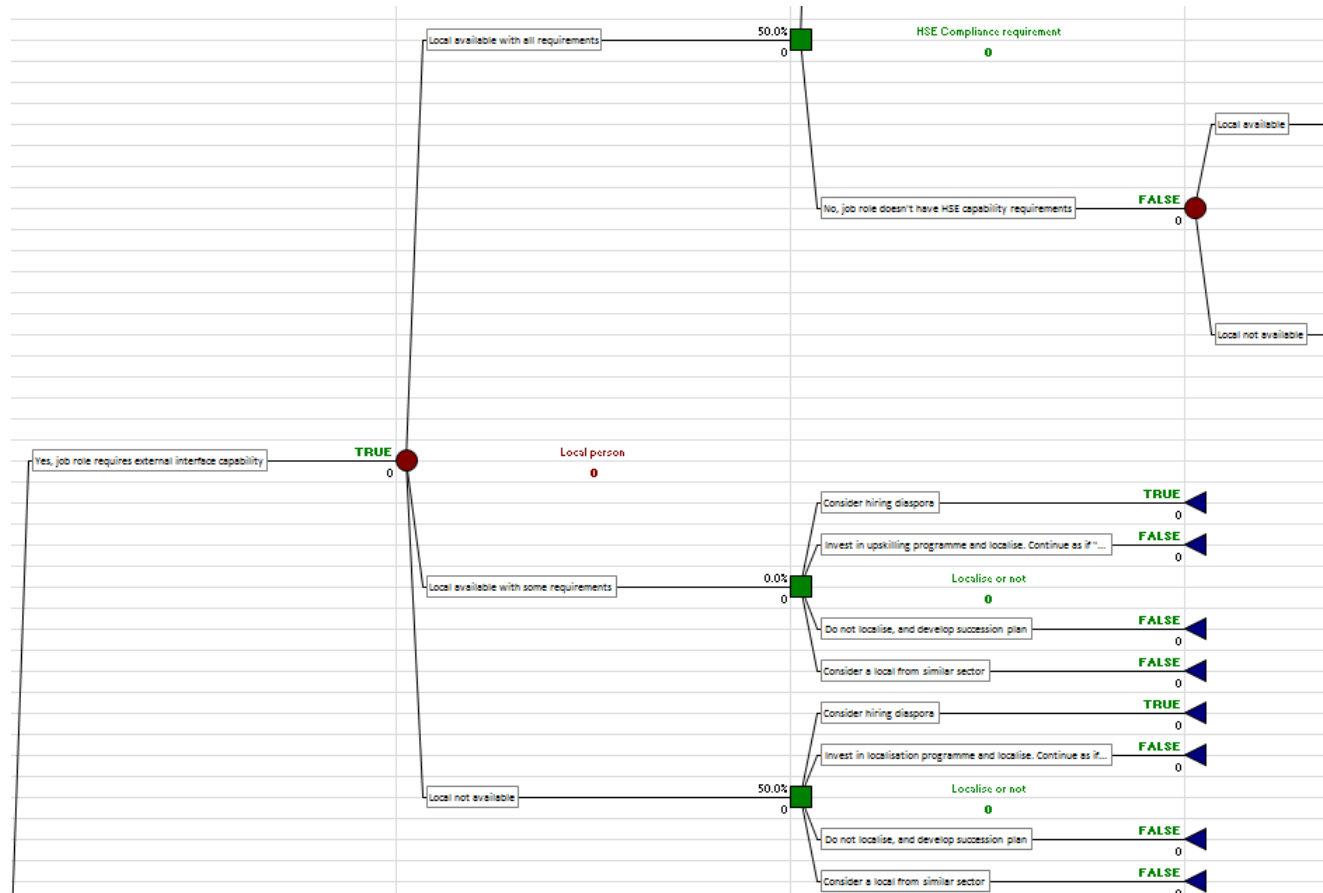


Figure C-24: Stage 16b - Local availability

Stage 17: HSE Compliance requirement

This stage allows the user to decide whether or not the job requires has HSE compliance requirements or not, in Figure C-25.

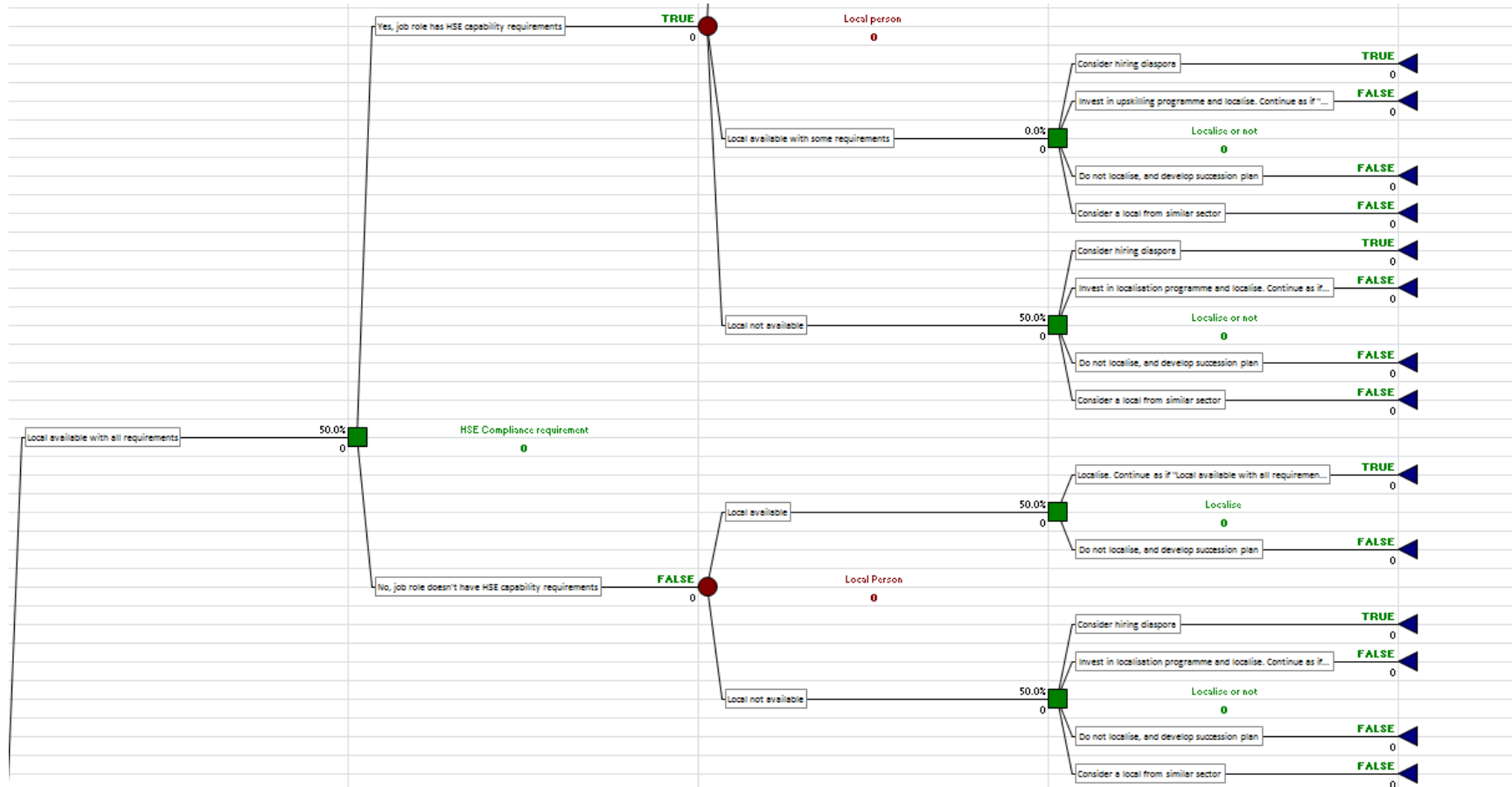


Figure C-25: Stage 17 - HSE Compliance requirement

Stage 17b: Local availability

This stage allows the user to decide whether a local person is available, in Figure C-26.

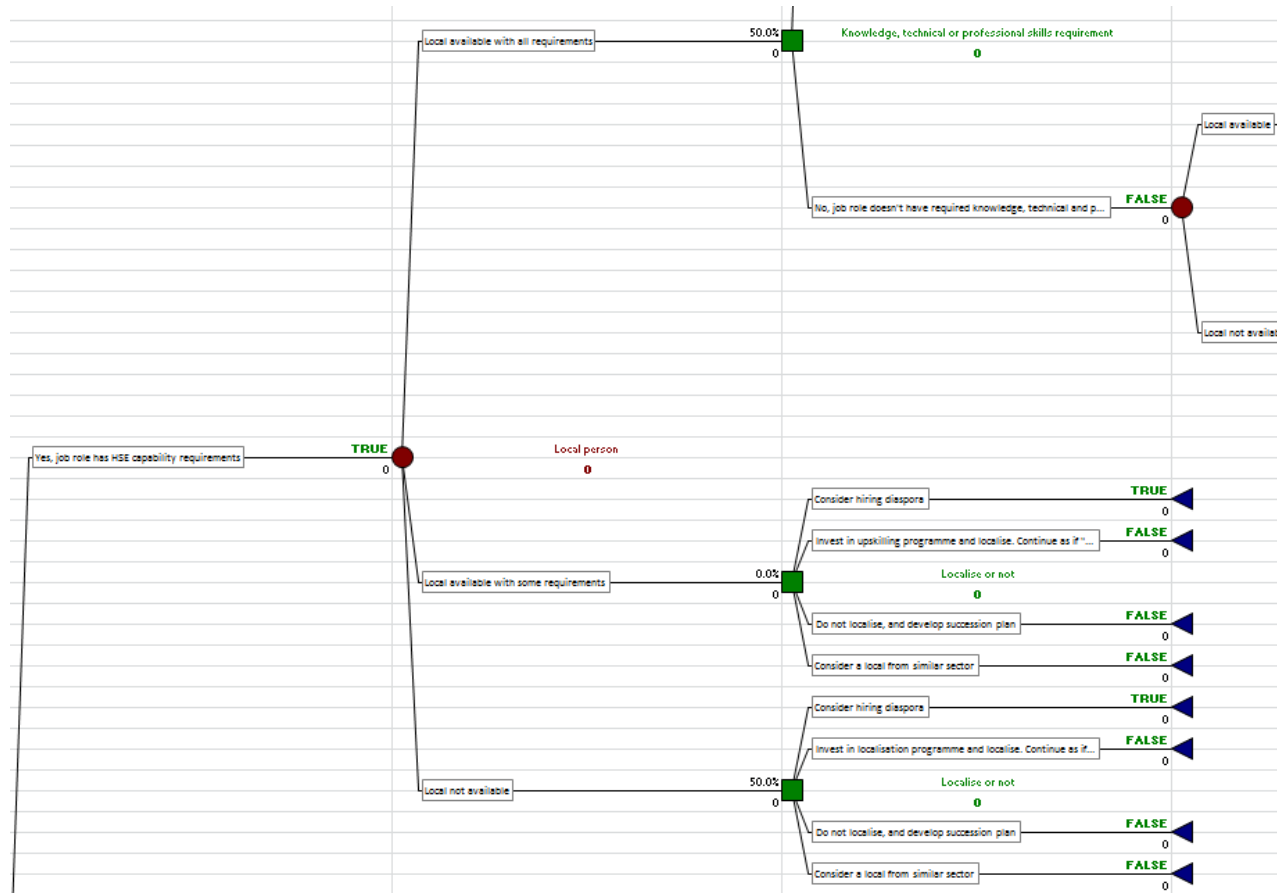


Figure C-26: Stage17b - Local availability

Stage 18: Knowledge, technical or professional skills

This stage allows the user to decide whether or not the job requires individuals to have specific knowledge, technical or professional skills to complete the job role, in Figure C-27.

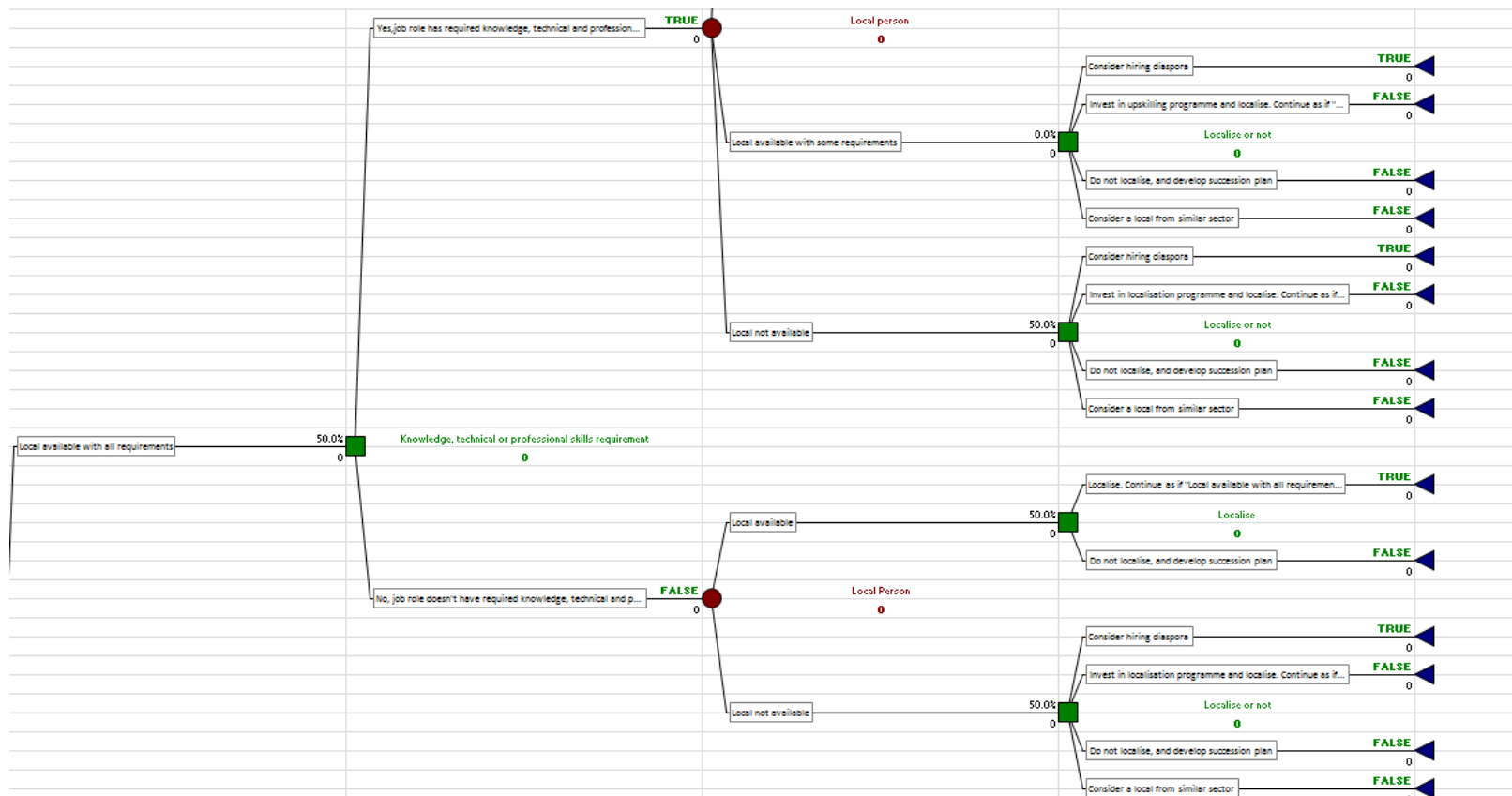


Figure C-27: Stage 18 - Knowledge, technical or professional skills requirement

Stage 18b: Local availability

This stage allows the user to decide whether a local person is available, in Figure C-28.

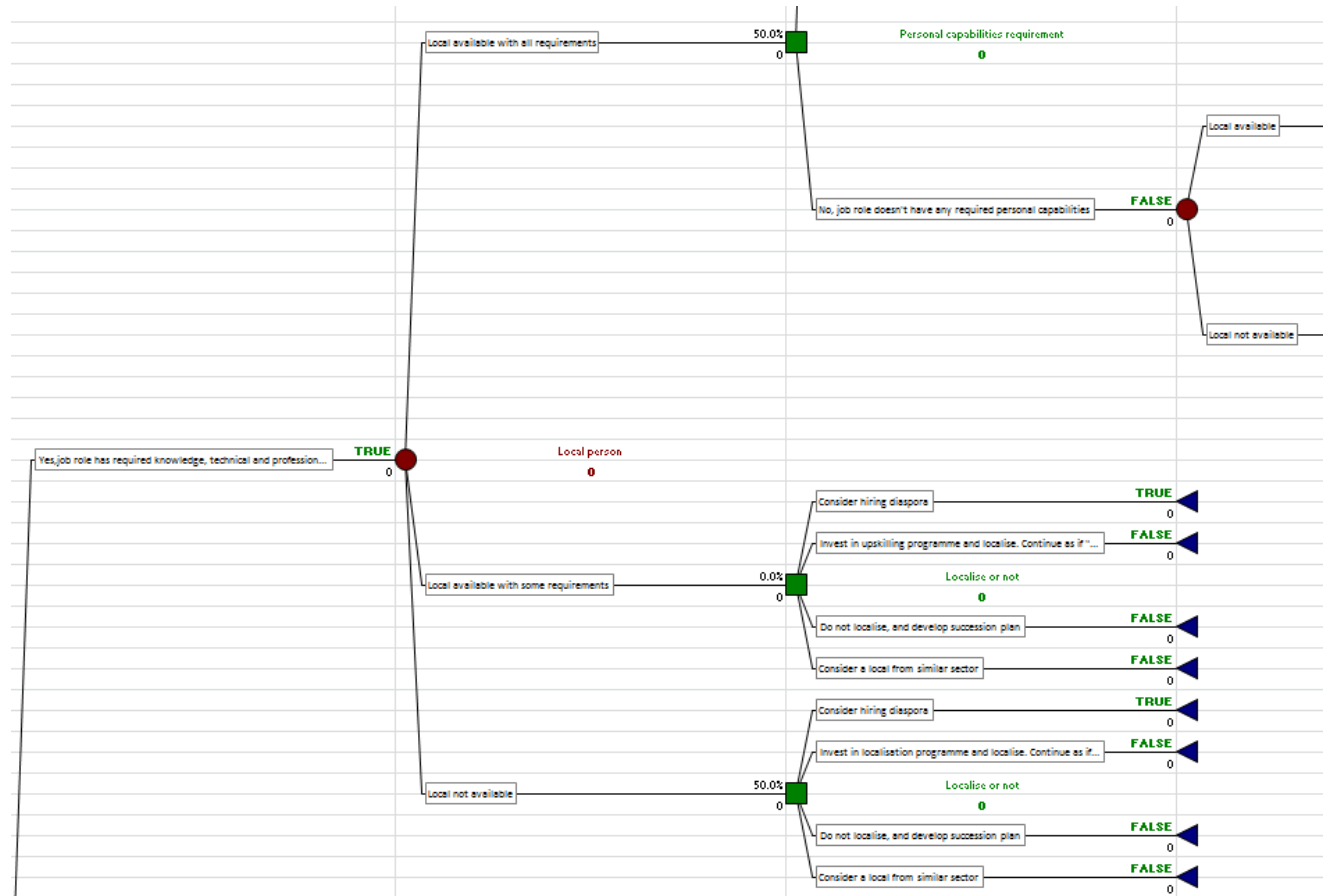


Figure C-28: Stage 18b - Local availability

Stage 19: Personal capabilities requirement

This stage allows the user to decide whether or not the job requires specific personal capabilities to be able to competently hold the job role, in Figure C-29.

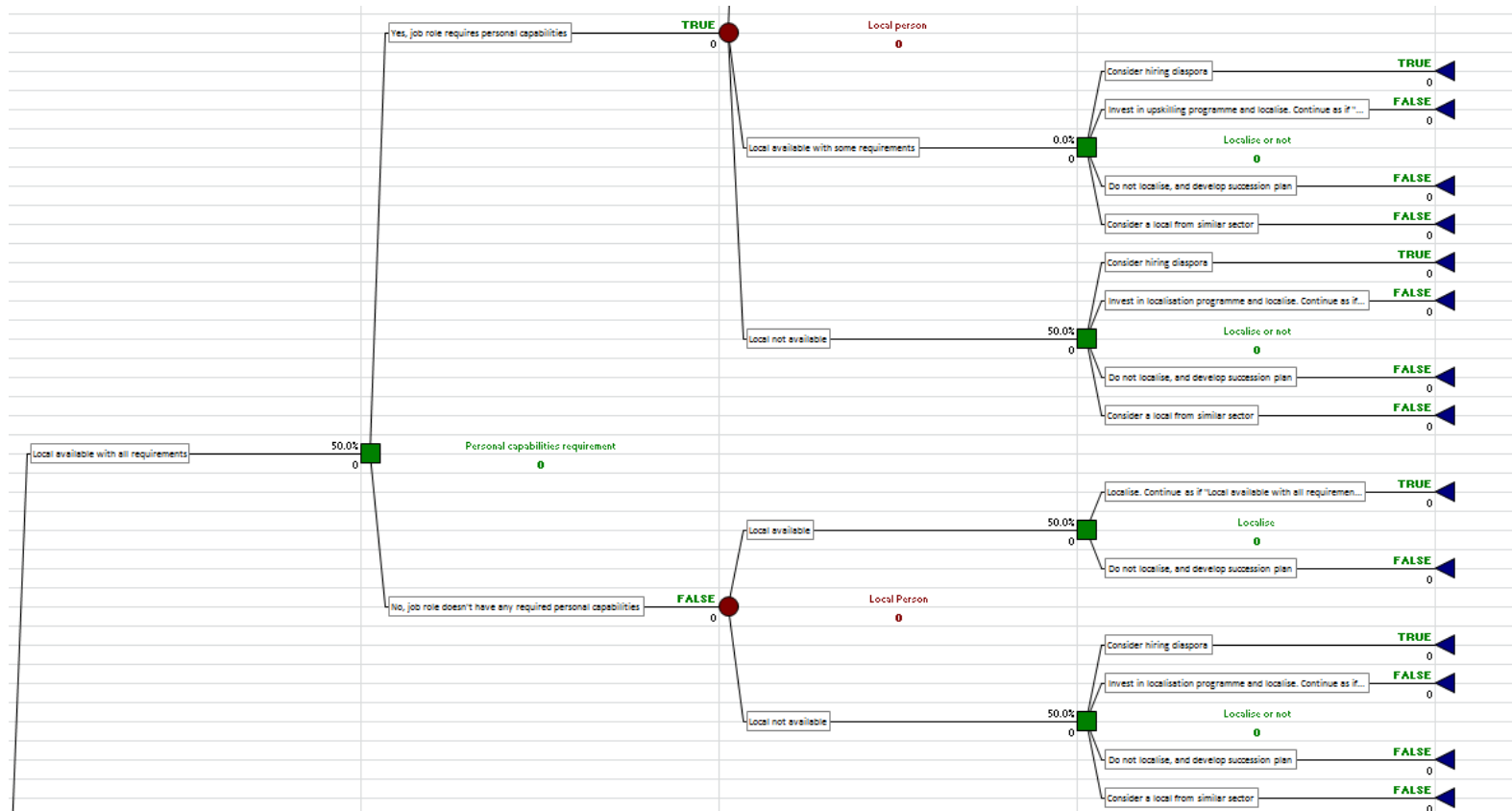


Figure C-29: Stage 19 - Personal capabilities requirement

Stage 19b: Local availability

This stage allows the user to decide whether a local person is available, in Figure C-30.

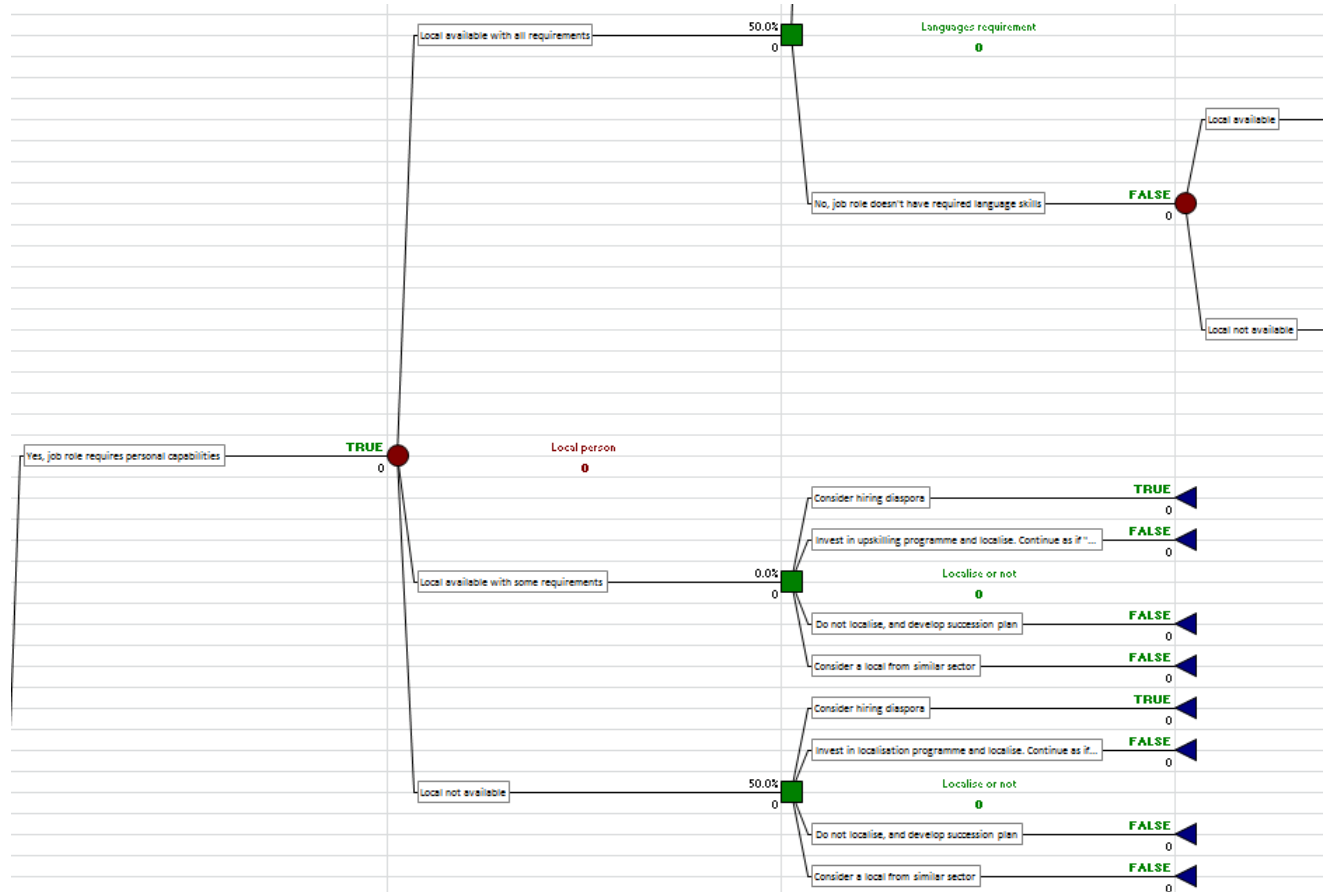


Figure C-30: Stage 19b - Local availability

Stage 20: Languages requirement

This stage allows the user to decide whether or not the job requires any specific languages, in Figure C-31.

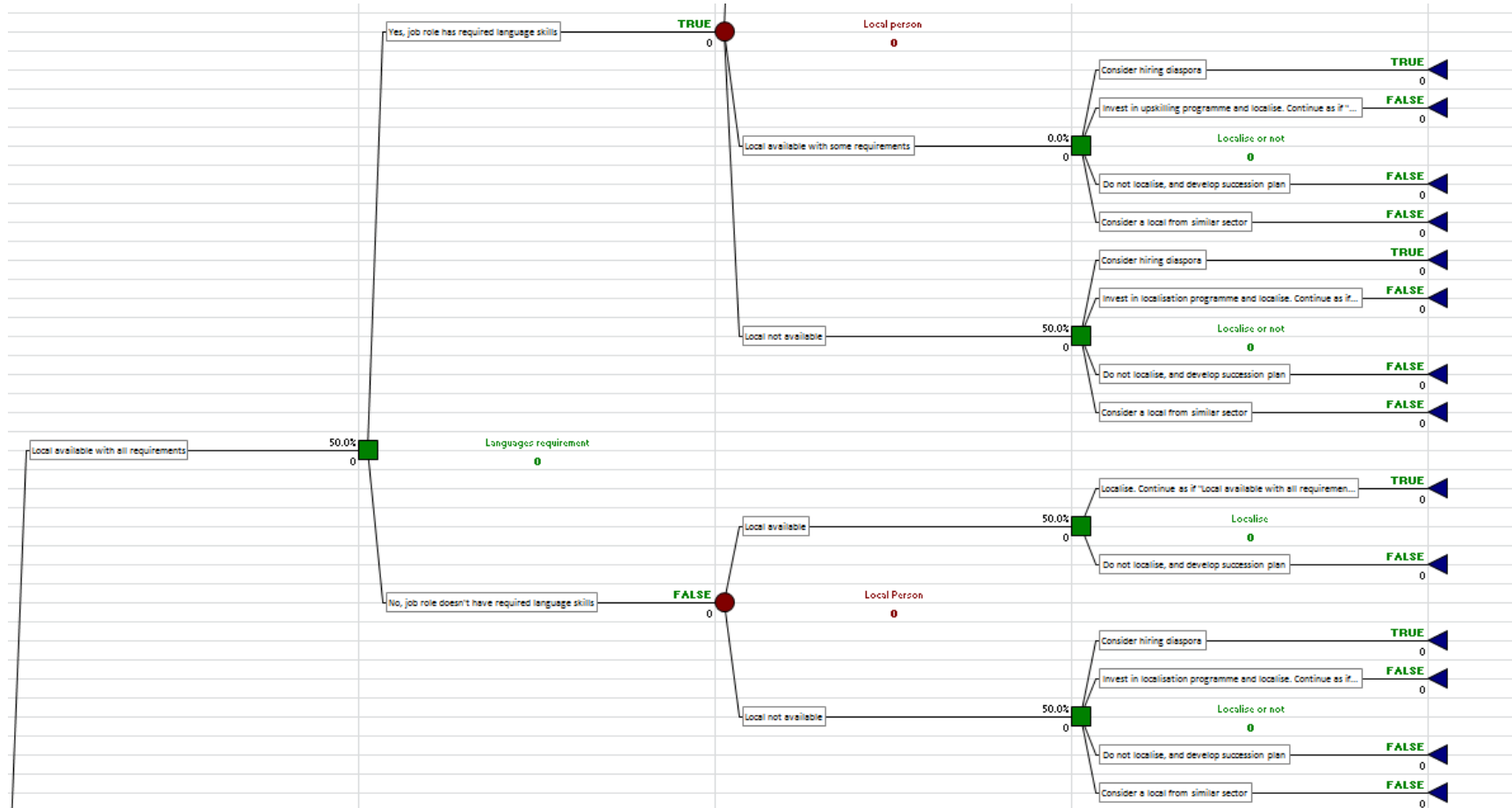


Figure C-31: Stage 20 - Languages requirement

Stage 20b: Local availability

This stage allows the user to decide whether a local person is available, in Figure C-32.

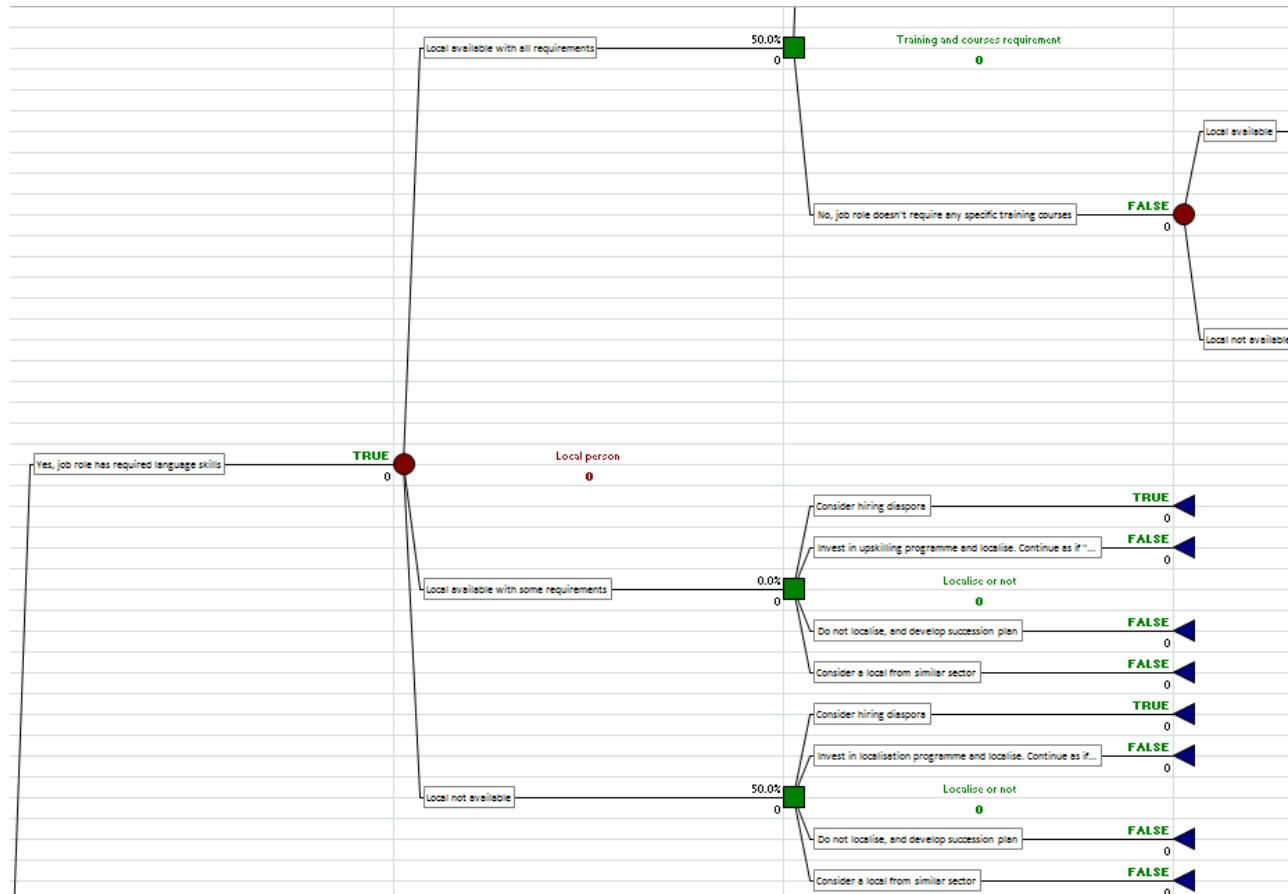


Figure C-32: Stage 20b - Local availability

Stage 21: Training and courses requirement

This stage allows the user to decide whether or not the job requires individuals to have completed particular training courses, in Figure C-33.

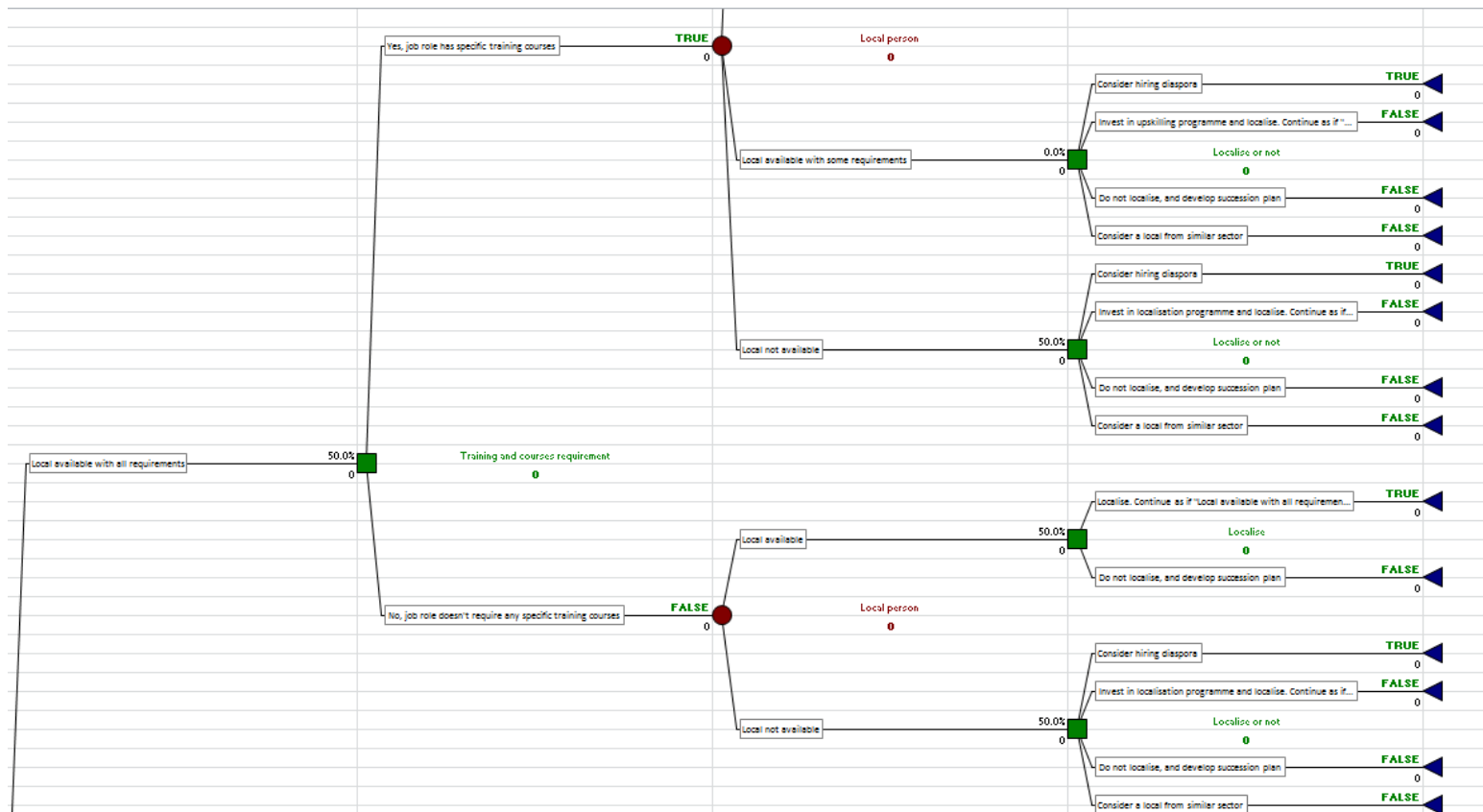


Figure C-33: Stage 21 - Training and courses requirement

Stage 21b: Local availability

This stage allows the user to decide whether a local person is available, in Figure C-34.

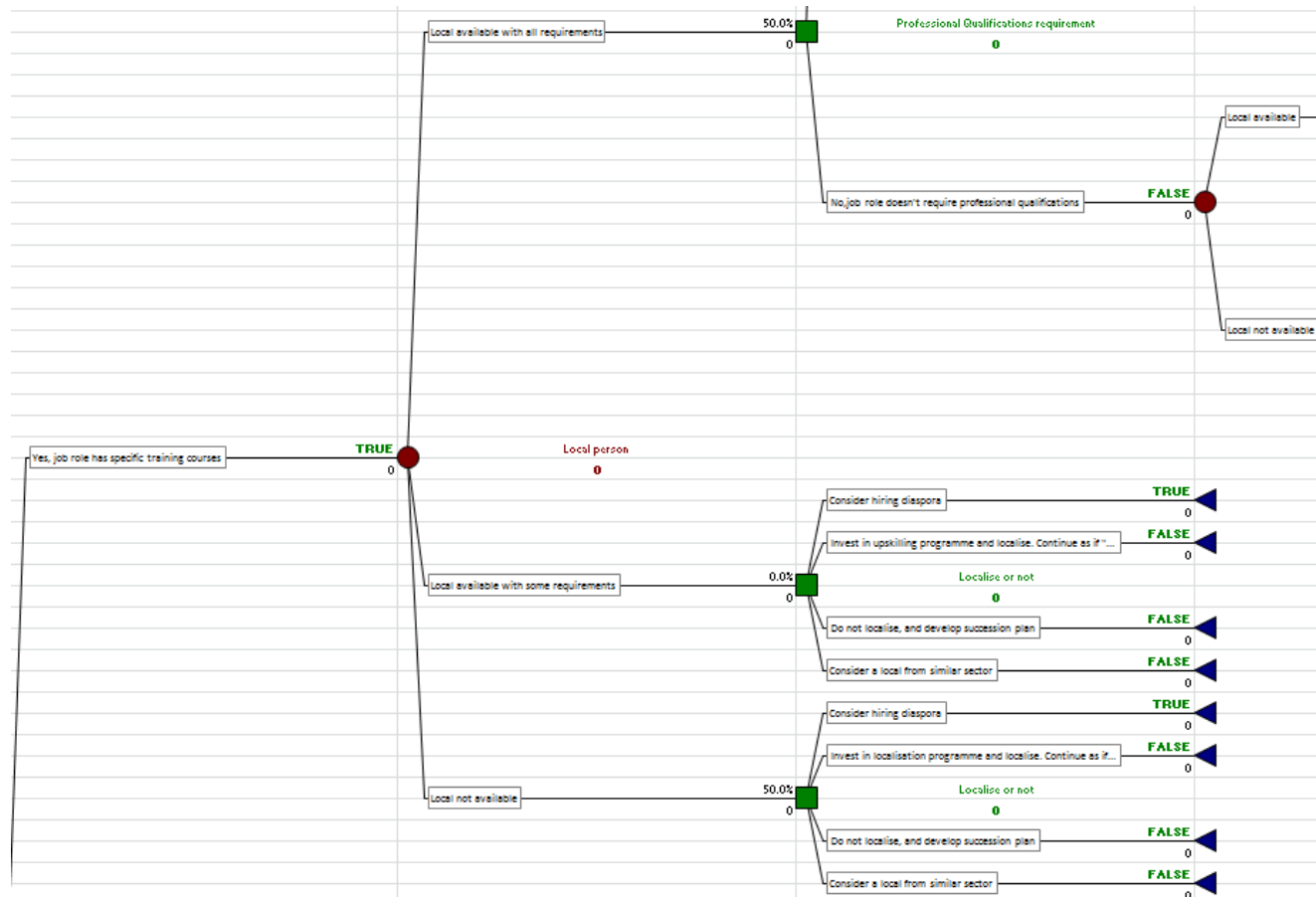


Figure C-34: Stage 21b - Local availability

Stage 22: Professional Qualifications requirement

This stage allows the user to decide whether or not the job requires any professional qualifications, in Figure C-35.

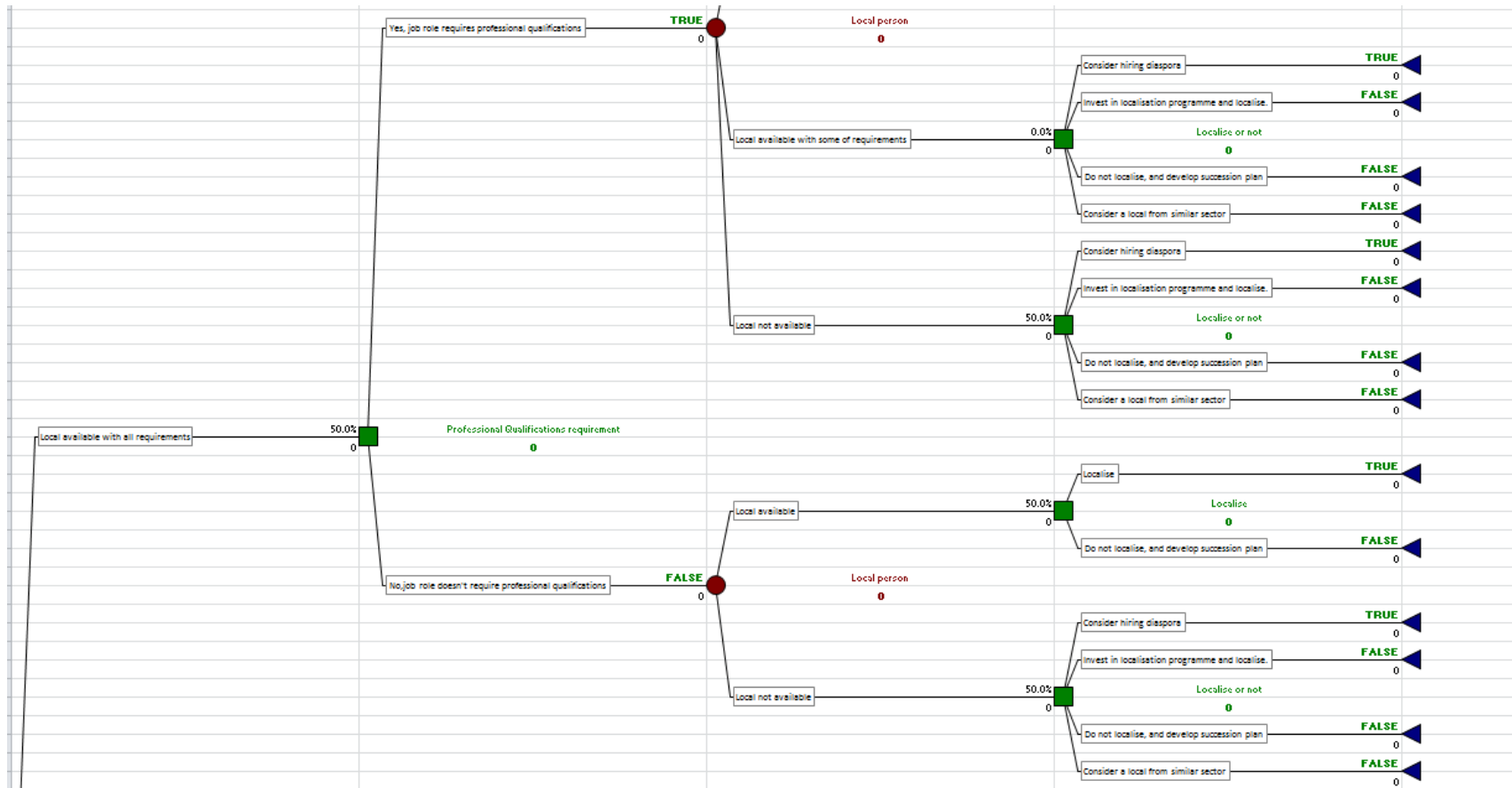


Figure C-35: Stage 22 - Professional Qualifications requirement

Stage 22b: Local availability

This stage allows the user to decide whether a local person is available, in Figure C-36.

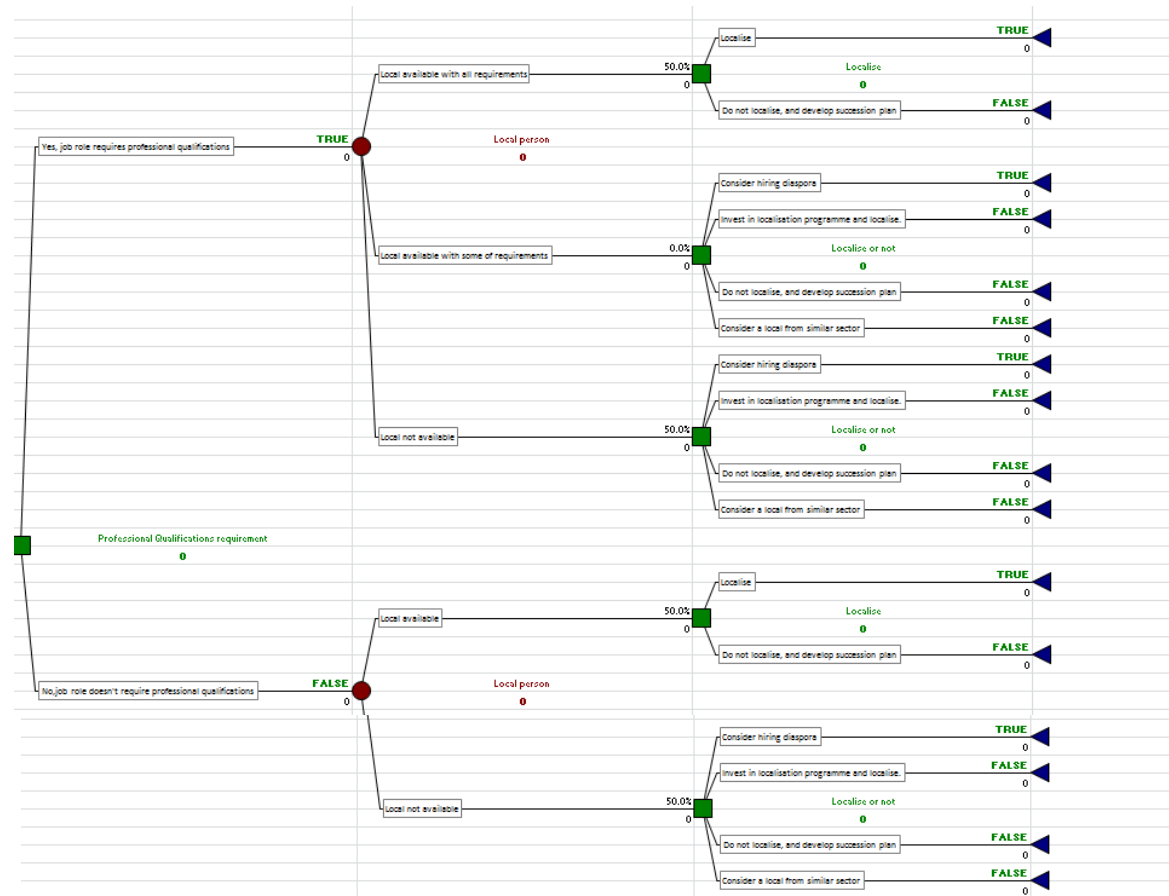


Figure C-36: Stage 22b - Local availability

Appendix D - Hypothesis four

D.1 Training and development timeline calculations

The following section includes total costs and timeframes for courses and competency developments for each job role.

The figures below correspond with the training and development timeline Gantt charts in chapter 5.4.1.

Please note the following for each job role:

- For each education programme, this includes three years of education fees, accommodation, additional university fees and an additional buffer for the education period.
- For the English language courses this includes all course fees, examination fees and accommodation for three months in Accra.
- Once employed in Ghana, it is assumed each person would cover their own accommodation. This includes all salary and additional buffer for unknown costs. The salary is based on the highest local salary provided in Eni Ghana's secondary data.
- Once employed overseas, salaries and additional remunerations are more than quadrupled to \$106,279 per annum (based on SPE Median remuneration data).
- For all training courses internationally this includes course costs, economy flights, accommodation and an additional buffer of approximately \$100 USD per day.
- For courses in Accra, the course costs are covered and an additional buffer is included, however no travel or accommodation costs are included.

Role 1: FPSO Company Rep Manager

Total costs and timeframes for courses and competency developments for two FPSO Company Rep Managers, shown in Table D-1.

Table D-1: FPSO Company Rep Manager training and development calculations

Type	Tasks	Start	End	Estimated Total Cost (USD)	Who to approach?	Extra info	Location
Education	Engineering/technical degree	15/08/2012	15/05/2015	USD 9,890	KNUST	BSc Mechanical Engineering	Ghana
Language	Fluent English	01/06/2015	01/09/2015	USD 8,959	GODAC	English Language	Ghana
Experience	12 years of experience onshore/offshore	01/09/2015	01/09/2027	USD 295,887	Eni	Based on 7 years for top end salary for local average	Ghana
Experience	5 years of experience on FPSO	01/09/2022	01/09/2027	USD 531,395	Eni	Based on 5 Years experience abroad	International
Training and Courses	Management skills course	01/01/2022	04/01/2022	USD 300	GIMPA	Leading and Managing People	Ghana
Training and Courses	HSE course	05/01/2022	10/01/2022	USD 695	SHEilds	eLearning NEBOSH Oil and Gas Certificate	Ghana - eLearning
Training and Courses	Offshore survival course	11/01/2022	16/01/2022	USD 1,052	SMTC Ghana	TBOSIET, EBS & TSBB & MIST	Ghana
Training and Courses	Production & process related course	17/01/2022	27/01/2022	USD 11,753	PetroSkills	Oil Production and Processing Facilities	Dubai

Training and Courses	Maintenance course	28/01/2022	02/02/2022	USD 6,440	PetroKnowledge	FPSO Operation and Maintenance	Dubai
Training and Courses	O&G production facilities course	03/02/2022	08/02/2022	USD 6,442	NExT Schlumberger	Surface Facility Production Operations	Oman
Training and Courses	Flow assurance course	09/02/2022	14/02/2022	USD 7,126	PetroSkills	Flow Assurance for Offshore Production	London
Personal capabilities	HSEQ Leader	15/02/2022	20/02/2022	USD 7,026	PetroSkills	Applied HSE Management	London
Personal capabilities	Problem Solving	21/02/2022	02/05/2022	USD 2,012	GIMPA	Senior Management Development Programme	Ghana
Personal capabilities	Flexibility	21/02/2022	02/05/2022	USD 0	GIMPA	See - Senior Management Development Programme	Ghana
Personal capabilities	Innovation	21/02/2022	02/05/2022	USD 0	GIMPA	See - Senior Management Development Programme	Ghana
Personal capabilities	Planning target control	21/02/2022	02/05/2022	USD 0	GIMPA	See - Senior Management Development Programme	Ghana
Personal capabilities	Comms & inter personnel skills	03/05/2022	07/05/2022	USD 6,606	MDT International	International Business Communication Skills	London
Personal capabilities	Mgmt & monitoring of KPI	08/05/2022	13/05/2022	USD 430	GIMPA	Office Management and Supervisory Skills	Ghana
Personal capabilities	Decision Making	14/05/2022	19/05/2022	USD 364	GIMPA	Five -Star Organisational Performance Culture	Ghana
Personal capabilities	Contract Management	20/05/2022	25/05/2022	USD 5,516	MDT International	Negotiation Skills for the Oil and Gas Industry	Dubai
Personal capabilities	Manage multicult & multinat team	26/05/2022	29/05/2022	USD 4,652	HOT Engineering	Success in Multicultural Teams	Vienna

Personal capabilities	Staff mgmnt & career development	30/05/2022	04/06/2022	USD 5,375	HOT Engineering	The Senior Management Program: Developing Leadership Capacity	Vienna
Knowledge, tech or professional skills	HSEQ company's safety mgnt culture	22/04/2022	27/04/2022	USD 3,946	Eni Corporate University	HSE company training	Milan
Knowledge, tech or professional skills	Commissioning - decom	17/01/2022	27/01/2022	USD 6,780	IFP Training	'Precommissioning, Commissioning & Start-up'	Paris
Knowledge, tech or professional skills	Production Operations	04/05/2022	09/05/2022	USD 11,932	Petroskills	"Production Operations"	London
Knowledge, tech or professional skills	Maintenance Operations	28/01/2022	02/02/2022	USD 0	PetroKnowledge	FPSO Operation and Maintenance	Dubai
Knowledge, tech or professional skills	Inventory Management	10/05/2022	14/05/2022	USD 6,685	Informa Middle East	Materials Management & Inventory Planning	Dubai
Knowledge, tech or professional skills	Computerised Maint. Mgmt System	15/05/2022	19/05/2022	USD 6,685	SAP	Business Processes in Plant Maintenance	Johannesburg
Training and Courses	Buffer for courses/CPD	15/08/2012	01/09/2027	USD 150,000		USD 10,000 per annum	

Role 2: Exploration Manager

Total costs and timeframes for courses and competency developments for an Exploration Manager, shown in Table D-2.

Table D-2: Exploration Manager training and development calculations

Type	Tasks	Start	End	Estimated Total Cost (USD)	Who to approach?	Extra info	Location
Education	Geoscience degree B.Sc.	15/08/2014	15/05/2017	USD 9,614	University of Ghana	BSc Earth Sciences	Ghana
Language	Fluent in English language	01/06/2017	01/09/2017	USD 8,959		English Language	Ghana
Experience	10 years experience in exploration	01/09/2017	01/09/2027	USD 211,350	Eni	Based on 5 years in Ghana	Ghana
Experience	5 years experience overseas	01/09/2022	01/09/2027	USD 531,395	Eni	Based on 5 years outside Ghana	International
Training and Courses	Basin modelling & pet. systems	01/01/2021	06/01/2021	USD 6,166	NExT	Petroleum Systems & Explor. & Dev. Geochemistry	London
Training and Courses	Sequence and seismic stratigraphy	06/01/2021	11/01/2021	USD 6,554	PetroKnowledge	Stratigraphy - Sequence, Seismic & Integrated Stratigraphic Analysis	Dubai
Training and Courses	Seismic interpretation techniques	12/01/2021	16/01/2021	USD 6,378	Nautilus	Advanced Seismic Interpretation	London
Training and Courses	Project management & risk analysis	17/01/2021	21/01/2021	USD 6,771	The Knowledge Academy	Project Management Professional (PMP)® Cert.	Ghana

Training and Courses	Total explorationists course	22/01/2021	27/01/2021	USD 6,342	HOT Engineering	Introduction to Geoscience	Houston
Training and Courses	Pet. economics, risks and reserves	28/01/2021	02/02/2021	USD 7,212	Nautilus	Petroleum Economics and Risk Analysis	London
Training and Courses	E&P Project Finance and control	03/02/2021	08/02/2021	USD 7,836	BMC Training	Finance and Accounting for the Oil and Gas Industry	London
Training and Courses	Survival courses	09/02/2021	14/02/2021	USD 1,052	SMTC Ghana	TBOSIET, EBS & TSBB & MIST	Ghana
Professional Qualifications	AAPG, EAGE, NAPE Member	15/02/2021	20/02/2021	USD 1,550	AAPG & EAGE	Membership	International
Personal capabilities	Problem solving	21/02/2021	26/02/2021	USD 2,012	GIMPA	Senior Management Development Programme	Ghana
Personal capabilities	Flexibility	27/02/2021	04/03/2021	USD 0	GIMPA	See - Senior Management Development Programme	Ghana
Personal capabilities	Relations management	05/03/2021	10/03/2021	USD 0	GIMPA	See - Senior Management Development Programme	Ghana
Personal capabilities	Listening and reception	11/03/2021	16/03/2021	USD 0	GIMPA	See - Senior Management Development Programme	Ghana
Personal capabilities	Communication	17/03/2021	22/03/2021	USD 6,606	MDT International	International Business Communication Skills	London
Knowledge, tech or professional skills	Multi-disciplinary integrated expl.	23/03/2021	27/03/2021	USD 7,126	PetroSkills	Reservoir Characterization: A Multi-Disciplinary Team Appr.	London
Knowledge, tech or professional skills	Well & seismic data analysis	28/03/2021	02/04/2021	USD 6,913	NExT	Subsurface Facies Analysis - Integrating Borehole Images & Well Logs ... course	Kuala Lumpur

Knowledge, tech or professional skills	Seismic interpretation	03/04/2021	08/04/2021	USD 7,126	PetroSkills	'Prospect and play assessment" course	London
Knowledge, tech or professional skills	Prospect generation & eval.	03/04/2021	08/04/2021	USD 0	PetroSkills	Prospect and play assessment	London
Knowledge, tech or professional skills	Prospect risks & economics	09/04/2021	14/04/2021	USD 6,126	Esanda	Risk Analysis, Prospect Evaluation and Exploration Economics	London
Knowledge, tech or professional skills	Seismic acquisition & processing	15/04/2021	20/04/2021	USD 5,442	NExT	Seismic Acquisition and Processing	Muscat
Knowledge, tech or professional skills	Well planning & drilling/log acqu.	21/04/2021	26/04/2021	USD 7,136	AGR TRACS	Integrated Well Planning and Drilling Operations	London
Knowledge, tech or professional skills	Well testing, reserves & reservoir	27/04/2021	02/05/2021	USD 5,414	HOT Engineering	Well Testing Operations, Interpretation and Design	Vienna
Knowledge, tech or professional skills	Budgeting & project finance	03/05/2021	08/05/2021	USD 3,488	HOT Engineering	Mastering Finance for Non-Financial Oil & Gas Personnel	Vienna
Knowledge, tech or professional skills	Contracts and negotiation skill	09/05/2021	14/05/2021	USD 5,516	MDT International	Negotiation Skills for the Oil and Gas Industry	Dubai
Knowledge, tech or professional skills	Operative procedures	15/05/2021	20/05/2021	USD 3,946	Eni Corporate University	Experience, mentoring and Internal best practice training	Milan
Knowledge, tech or professional skills	Internal standards & best practices	21/05/2021	26/05/2021	USD 3,946	Eni Corporate University	Experience, mentoring and Internal best practice training	Milan
Knowledge, tech or professional skills	Operational security	27/05/2021	01/06/2021	USD 4,139	IFF	Operational Risk Training Course	London
Training and Courses	Buffer for courses/CPD	15/08/2014	01/09/2027	USD 130,000		USD 10,000 per annum	

Role 3: Production and Maintenance Manager

Total costs and timeframes for courses and competency developments for an Production and Maintenance Manager, shown in Table D-3.

Table D-3: Production and Maintenance Manager training and development calculations

Type	Tasks	Start	End	Estimated Total Cost (USD)	Who to approach?	Extra info	Location
Education	Engineering degree	15/08/2012	15/05/2015	USD 9,890	KNUST	BSc Mechanical Engineering	Ghana
Language	Fluent knowledge of English	01/06/2015	01/09/2015	USD 8,959	GODAC	English Language	Ghana
Experience	12 years industry experience	01/09/2015	01/09/2027	USD 295,890	Eni	Based on 7 years for top end salary for local average	Ghana
Experience	5 years Project management	01/09/2022	01/09/2027	USD 531,395	Eni	Based on 5 Years experience abroad on top end salary	International
Training and Courses	Mgmt skills advanced course	01/01/2022	07/01/2022	USD 1,425	Logos Business School	Advanced Management and Leadership Programme (AMLP)	Ghana
Training and Courses	Economics basic courses	08/01/2022	20/01/2022	USD 397	GIMPA	Certificate in Petroleum, Oil and Gas Management	Ghana
Training and Courses	Petroleum engineering	21/01/2022	26/01/2022	USD 6,173	HOT Engineering	Production Engineering	London

Training and Courses	O&G production facilities course	27/01/2022	01/02/2022	USD 6,442	NExT Schlumberger	Surface Facility Production Operations	Oman
Training and Courses	Maintenance prof. course	02/02/2022	08/02/2022	USD 6,760	PetroSkills	Maintenance Planning And Work Control	Dubai
Training and Courses	Project Management	09/02/2022	13/02/2022	USD 6,771	The Knowledge Academy	Project Management Professional (PMP)® Cert.	Ghana
Training and Courses	Asset Integrity Management	14/02/2022	19/02/2022	USD 6,440	PetroKnowledge	Asset Integrity Management for Purpose-Built FPSO's and Subsea System Facilities	Dubai
Personal capabilities	Problem solving	20/02/2022	01/05/2022	USD 2,012	GIMPA	Senior Management Development Programme	Ghana
Personal capabilities	Flexibility	20/02/2022	01/05/2022	USD 0	GIMPA	See - Senior Management Development Programme	Ghana
Personal capabilities	Innovation	20/02/2022	01/05/2022	USD 0	GIMPA	See - Senior Management Development Programme	Ghana
Personal capabilities	Planning target control	20/02/2022	01/05/2022	USD 0	GIMPA	See - Senior Management Development Programme	Ghana
Personal capabilities	Decision making	20/02/2022	01/05/2022	USD 0	GIMPA	See - Senior Management Development Programme	Ghana
Personal capabilities	Team building	02/05/2022	07/05/2022	USD 4,652	HOT Engineering	Success in Multicultural Teams	Vienna
Personal capabilities	Spirit of Enterprise	08/05/2022	13/05/2022	USD 3,946	ECU	Experience, mentoring and Internal best practice training	Milan
Personal capabilities	Communication	14/05/2022	19/05/2022	USD 6,606	MDT International	International Business Communication Skills	London
Personal capabilities	Listening and reception	14/05/2022	19/05/2022	USD 0	MDT	See - International Business	London

					International	Communication	
Personal capabilities	Staff mgmnt & development	20/05/2022	25/05/2022	USD 5,375	HOT Engineering	The Senior Management Program: Developing Leadership Capacity	Vienna
Personal capabilities	Relations management	20/05/2022	25/05/2022	USD 0	HOT Engineering	See - The Senior Management	Vienna
Knowledge, tech or professional skills	Commissioning - Decom	26/05/2022	31/05/2022	USD 6,780	IFP Training	Precommissioning, Commissioning & Start-up	Paris
Knowledge, tech or professional skills	Production Operations	01/06/2022	11/06/2022	USD 11,753	PetroSkills	'Oil Production and Processing Facilities' course	Dubai
Knowledge, tech or professional skills	Maintenance System Auditing	12/06/2022	15/06/2022	USD 3,331	SAP	Business Processes in Plant Maintenance	Johannesburg
Knowledge, tech or professional skills	Economics General	16/06/2022	21/06/2022	USD 3,488	HOT Engineering	Mastering Finance for Non-Financial Oil & Gas Personnel	Vienna
Knowledge, tech or professional skills	Data Management	22/06/2022	02/07/2022	USD 1,440	University of Ghana	Data Management and Analysis	Ghana
Knowledge, tech or professional skills	Organization Processes	03/07/2022	08/07/2022	USD 3,946	Eni Corporate University	Internal standards training	Milan
Knowledge, tech or professional skills	Compliance	09/07/2022	12/07/2022	USD 2,721	ABS Group	International regulations and standards training	London
Knowledge, tech or professional skills	Maintenance management	02/02/2022	08/02/2022	USD 0	PetroSkills	'Maintenance Planning And Work Control' course	Dubai
Knowledge, tech or professional skills	Supports and technologies	13/07/2022	18/07/2022	USD 6,440	PetroKnowledge	Understanding, Developing & Maintaining Oil & Gas Industry Quality Management Systems	Dubai
Training and Courses	Buffer for courses/CPD	15/08/2012	01/09/2027	USD 150,000		USD 10,000 per annum	

Role 4: Negotiations and Business Development Manager

Total costs and timeframes for courses and competency developments for a Negotiations and Business Development Manager, shown in Table D-4.

Table D-4: Negotiations and Business Development Manager training and development calculations

Type	Tasks	Start	End	Estimated Total Cost (USD)	Who to approach?	Extra info	Location
Education	University degree in Engineering	15/08/2014	15/05/2017	USD 9,890	KNUST	BSc Mechanical Engineering	Ghana
Language	Fluent in English	01/06/2017	01/09/2017	USD 8,959	GODAC	English Language	Ghana
Experience	10 years experience negotiation & BD	01/09/2017	01/09/2027	USD 84,540	Eni	Based on 2 years in Ghana	Ghana
Experience	8 years experience overseas	01/09/2019	01/09/2027	USD 850,232	Eni	Based on 8 years outside Ghana	International
Training and Courses	Eni Code of Ethics 231 Model	01/01/2022	06/01/2022	USD 3,946	Eni Corporate University	Eni Corporate Code of Ethics Training	Milan Italy
Personal capabilities	Interpersonal savvy	07/01/2022	08/01/2022	USD 4,063	The Knowledge Academy	Effective Communication	Ghana
Personal capabilities	Self confident	09/01/2022	20/03/2022	USD 1,550	GIMPA	Senior Management Development Programme	Ghana
Personal capabilities	Out-going personality	09/01/2022	20/03/2022	USD 0	GIMPA	See - Senior Management Development Programme	Ghana
Personal capabilities	Analytical skill	21/03/2022	31/03/2022	USD 1,550	GIMPA	Project Planning and	Ghana

						Management	
Personal capabilities	Detail orientation	21/03/2022	31/03/2022	USD 0	GIMPA	See - Project Planning and Management	Ghana
Personal capabilities	Communication skills	01/04/2022	06/04/2022	USD 6,606	MDT International	International Business Communication Skills	London
Personal capabilities	Excellent negotiation skills	07/04/2022	12/04/2022	USD 5,516	MDT International	Negotiation Skills for the Oil and Gas Industry	Dubai
Knowledge, tech or professional skills	Communication with Government	13/04/2022	17/04/2022	USD 5,922	International School of Communication	Strategic Public Affairs and Government Relations Programme (5 days)	London
Knowledge, tech or professional skills	Corporate Social Responsibility	18/04/2022	23/04/2022	USD 5,576	International School of Communication	Corporate Social Responsibility (CSR)	Dubai
Knowledge, tech or professional skills	Stakeholders management	24/04/2022	29/04/2022	USD 4,776	Hastings Business Training	Corporate Social Responsibility & Community Relations in the oil and Gas Industry	London
Training and Courses	Buffer for courses/CPD	15/08/2014	01/09/2027	USD 130,000		USD 10,000 per annum	

Role 5: Well Operations Manager

Total costs and timeframes for courses and competency developments for a Well Operations Manager, shown in Table D-5.

Table D-5: Well Operations Manager training and development calculations

Type	Tasks	Start	End	Estimated Total Cost (USD)	Who to approach?	Extra info	Location
Education	Engineering degree	15/08/2014	15/05/2017	USD 9,890	KNUST	BSc Mechanical Engineering	Ghana
Language	Fluent knowledge of English	01/06/2017	01/09/2017	USD 8,959	GODAC	English Language	Ghana
Experience	10 years experience with Eni	01/09/2017	01/09/2027	USD 211,350	Eni	Based on 5 years in Ghana	Ghana
Experience	5 years of completion execution	01/09/2022	01/09/2027	USD 0	Eni	Assumption of same as 5 years above or nationally	International
Experience	5 years experience overseas	01/09/2022	01/09/2027	USD 531,395	Eni	Based on 5 years outside Ghana	International
Training and Courses	Basic Oil	01/01/2022	06/01/2022	USD 6,143	Esanda Engineering	Upstream Oil and Gas Facilities Fundamentals: Onshore, Offshore, FPSOs and Subsea	London
Training and Courses	Drilling & Completion course	07/01/2022	12/01/2022	USD 2,119	GODAC	IWCF Well Control – Combined Surface And Subsea Bop – Supervisor Level	Ghana
Training and Courses	Completion advanced course	13/02/2022	18/02/2022	USD 4,454	Herriott Watt University	Advanced Completion Engineering	Aberdeen

Training and Courses	Geology Basic course	19/02/2022	24/02/2022	USD 6,342	HOT Engineering	Operations Geology	Abu Dhabi
Training and Courses	Subsurface & Reservoir Basic course	25/02/2022	02/03/2022	USD 6,761	PetroSkills	Reservoir Engineering for Other Disciplines	Aberdeen
Personal capabilities	Problem Solving	03/03/2022	12/05/2022	USD 2,012	GIMPA	Senior Management Development Programme	Ghana
Personal capabilities	Flexibility	03/03/2022	12/05/2022	USD 0	GIMPA	See - Senior Management Development Programme	Ghana
Personal capabilities	Innovation	03/03/2022	12/05/2022	USD 0	GIMPA	See - Senior Management Development Programme	Ghana
Personal capabilities	Planning target control	03/03/2022	12/05/2022	USD 0	GIMPA	See - Senior Management Development Programme	Ghana
Personal capabilities	Decision Making	03/03/2022	12/05/2022	USD 0	GIMPA	See - Senior Management Development Programme	Ghana
Personal capabilities	Spirit of Enterprise	13/05/2022	18/05/2022	USD 3,946	Eni Corporate University	Spirit of Enterprise	Milan
Personal capabilities	Staff management and development	19/05/2022	24/05/2022	USD 5,375	HOT Engineering	The Senior Management Program: Developing Leadership Capacity	Vienna
Personal capabilities	Strategic thinking	19/05/2022	24/05/2022	USD 0	HOT Engineering	See - The Senior Management Program	Vienna
Personal capabilities	Change management	25/05/2022	27/05/2022	USD 3,231	The Knowledge Academy	Change Management Foundation & Practitioner	London
Personal capabilities	Communication	28/05/2022	02/06/2022	USD 6,606	MDT International	International Business Communication Skills	London

Personal capabilities	Relations management	28/05/2022	02/06/2022	USD 0	MDT International	See- International Business Communication Skills	London
Personal capabilities	Listening and reception	28/05/2022	02/06/2022	USD 0	MDT International	See- International Business Communication Skills	London
Knowledge, tech or professional skills	Drilling Activities	03/06/2022	15/06/2022	USD 12,260	PetroSkills and On job experience	'Drilling Practices' course	Dubai
Knowledge, tech or professional skills	Completion Activities	16/06/2022	21/06/2022	USD 6,442	NExT and On job experience	'Workovers and Completions' course	Oman
Knowledge, tech or professional skills	Advanced Completions	22/06/2022	27/06/2022	USD 5,981	Mobility Oil and Gas Ltd.	Intelligent completions' course	London
Knowledge, tech or professional skills	High Profile Drilling	28/06/2022	03/07/2022	USD 6,550	PetroKnowledge	SIPROD for Offshore Platforms (Simultaneous Drilling and Production)	Dubai
Knowledge, tech or professional skills	High Profile Completions	04/07/2022	09/07/2022	USD 5,942	PetroKnowledge	Stimulation technologies	Abu Dhabi
Knowledge, tech or professional skills	Economics General	10/07/2022	15/07/2022	USD 3,488	HOT Engineering	Mastering Finance for Non-Financial Oil & Gas Personnel	Vienna
Knowledge, tech or professional skills	Contracting	16/07/2022	21/07/2022	USD 6,550	PetroKnowledge	Oil & Gas Contracts	Dubai
Knowledge, tech or professional skills	Technical Specifications & Bidding	22/07/2022	27/07/2022	USD 5,162	CP Training	Managing Bids and Tenders	London
Training and Courses	Buffer for courses or CPD	15/08/2014	01/09/2027	USD 130,000		USD 10,000 per annum	

D.2 Net present value calculations

The NPV calculations are included for each job role in the following section. The first table in each case is based on the training and development investment timelines. These incorporate an expatriate for ten years in each case, as such a combined discount rate for employing a Ghanaian at 13.04% and an expatriate at 7.76% are included for those years. The second table is based on an expatriate being employed for the 17 years of the operations phase using a discount rate of 7.76%.

Role 1: FPSO Company Rep Manager

NPV calculations for two locals for the FPSO Company Rep Manager role is shown in Table D-6.

Table D-6: FPSO Company Rep Manager local NPV calculations

Locals NPV			
Interest Rate	13.04%	2018 Ghanaian weighted average cost of capital of Oil/Gas (E&P) sector - 13.04%	
Initial Investment	26,593.32	First year of university, times 2 pax	2012
Net Cash Flows			
1	-26,593.32	Second year of uni, times 2 pax. And \$10,000 buffer, time 2 pax.	2013
2	-44,511.20	Third year of uni, and ELT, times 2 pax. And \$10,000 buffer, time 2 pax.	2014
3	-104,540.00	Yr one of employment in Ghana, time 2 pax. And \$10,000 buffer, time 2 pax.	2015
4	-104,540.00	Yr two of employment in Ghana, time 2 pax. And \$10,000 buffer, time 2 pax.	2016
5	-584,560.00	Yr three of employment in Ghana, time 2 pax. And Yr one of hiring two expats in Ghana at 7.76%. And \$10,000 buffer, time 2 pax.	2017
6	-567,277.00	Yr four of employment in Ghana, time 2 pax. And Yr two of hiring two expats in Ghana at 7.76%. And \$10,000 buffer, time 2 pax.	2018
7	-550,823.00	Yr five of employment, in Ghana, time 2 pax. And Yr three of hiring two expats in Ghana at 7.76%. And \$10,000 buffer, time 2 pax.	2019
8	-535,154.00	Yr six of employment in Ghana, time 2 pax. And Yr four of hiring two expats in Ghana at 7.76%. And \$10,000 buffer, time 2 pax.	2020
9	-723,861.14	Yr seven of employment in Ghana, time 2 pax. Incl. all training, times 2 pax. And Yr five of hiring two expats in Ghana at 7.76%. And \$10,000 buffer, time 2 pax.	2021
10	-634,022.00	Yr eight of employment, times 2 pax overseas. And Yr six of hiring two expats in Ghana at 7.76%. And \$10,000 buffer, time 2 pax.	2022
11	-620,464.00	Yr nine of employment, times 2 pax overseas. And Yr seven of hiring two expats in Ghana at 7.76%. And \$10,000 buffer, time 2 pax.	2023
12	-607,536.00	Yr ten of employment, times 2 pax overseas. And Yr eight of hiring two expats in Ghana at 7.76%. And \$10,000 buffer, time 2 pax.	2024
13	-595,205.00	Yr eleven of employment, times 2 pax overseas. And Yr nine of hiring two expats in Ghana. And \$10,000	2025

		buffer, time 2 pax.	
14	-583,439.00	Yr twelve of employment, times 2 pax overseas. And Yr ten of hiring two expats in Ghana. And \$10,000 buffer, time 2 pax.	2026
15	-212,558.00	Yr thirteen of employment, times 2 pax in Ghana	2027
16	-212,558.00	Yr fourteen of employment, times 2 pax in Ghana	2028
17	-212,558.00	Yr fifteen of employment, times 2 pax in Ghana	2029
18	-212,558.00	Yr sixteen of employment, times 2 pax in Ghana	2030
19	-212,558.00	Yr seventeen of employment, times 2 pax in Ghana	2031
20	-212,558.00	Yr eighteen of employment, times 2 pax in Ghana	2032
21	-212,558.00	Yr nineteen of employment, times 2 pax in Ghana	2033
Output:			
NPV	-USD 2,365,908.66		

NPV calculations for two expatriates for the FPSO Company Rep Manager role is shown in Table D-7.

Table D-7: FPSO Company Rep Manager expatriate NPV calculations

Expatriates NPV			
Interest Rate	7.76%	<i>2018 Italian weighted average cost of capital of Oil/Gas (E&P) sector - 7.76%</i>	
Initial Investment	480,020.00	Yr one of employing 2 expats	2017
Net Cash Flows			
1	-480,020.00	Yr two of employing 2 expats	2018
2	-480,020.00	Yr three of employing 2 expats	2019
3	-480,020.00	Yr four of employing 2 expats	2020
4	-480,020.00	Yr five of employing 2 expats	2021
5	-480,020.00	Yr six of employing 2 expats	2022
6	-480,020.00	Yr seven of employing 2 expats	2023
7	-480,020.00	Yr eight of employing 2 expats	2024
8	-480,020.00	Yr nine of employing 2 expats	2025
9	-480,020.00	Yr ten of employing 2 expats	2026
10	-480,020.00	Yr eleven of employing 2 expats	2027
11	-480,020.00	Yr twelve of employing 2 expats	2028
12	-480,020.00	Yr thirteen of employing 2 expats	2029
13	-480,020.00	Yr fourteen of employing 2 expats	2030
14	-480,020.00	Yr fifteen of employing 2 expats	2031
15	-480,020.00	Yr sixteen of employing 2 expats	2032
16	-480,020.00	Yr seventeen of employing 2 expats	2033
Output:			
NPV	-USD 4,794,833.97		

Role 2: Exploration Manager

NPV calculations for one local for the Exploration Manager role is shown in Table D-8.

Table D-8: Exploration Manager local NPV calculations

Local NPV			
Interest Rate	13.04%	<i>2018 Ghanaian weighted average cost of capital of Oil/Gas (E&P) sector - 13.04%</i>	
Initial Investment	13,204.66	First year of university	2014
Net Cash Flows			
1	-13,204.00	Second year of uni	2015
2	-22,162.94	Third year of uni, and ELT	2016
3	-353,807.00	Yr one of employment in Ghana. And one expat hired at 7.76%	2017
4	-342,951.00	Yr two of employment in Ghana. And one expat hired at 7.76%	2018
5	-332,614.00	Yr three of employment in Ghana. And one expat hired at 7.76%	2019
6	-322,772.00	Yr four of employment in Ghana. And one expat hired at 7.76%	2020
7	-438,191.61	Yr five of employment in Ghana. And one expat hired at 7.76%	2021
8	-368,470.00	Yr six of employment, international. Incl. all training. And one expat hired at 7.76%	2022
9	-359,953.00	Yr seven of employment, international. And one expat hired at 7.76%	2023
10	-351,832.00	Yr eight of employment, international. And one expat hired at 7.76%	2024
11	-344,086.00	Yr nine of employment, international. And one expat hired at 7.76%	2025
12	-336,694.00	Yr ten of employment, international. And one expat hired at 7.76%	2026
13	-106,279.00	Yr eleven of employment in Ghana	2027
14	-106,279.00	Yr twelve of employment in Ghana	2028
15	-106,279.00	Yr thirteen of employment in Ghana	2029
16	-106,279.00	Yr fourteen of employment in Ghana	2030
17	-106,279.00	Yr fifteen of employment in Ghana	2031
18	-106,279.00	Yr sixteen of employment in Ghana	2032
19	-106,279.00	Yr seventeen of employment in Ghana	2033
Output:			
NPV	-USD 1,653,408.47		

NPV calculations for one expatriate for the Exploration Manager role is shown in Table D-9.

Table D-9: Exploration Manager expatriate NPV calculations

Expatriate NPV			
Interest Rate	7.76%	<i>2018 Italian weighted average cost of capital of Oil/Gas (E&P) sector - 7.76%</i>	
Initial Investment	301,537.50	Yr one of employing an expat	2017
Net Cash Flows			
1	-301,537.50	Yr two of employing an expat	2018
2	-301,537.50	Yr three of employing an expat	2019
3	-301,537.50	Yr four of employing an expat	2020
4	-301,537.50	Yr five of employing an expat	2021
5	-301,537.50	Yr six of employing an expat	2022
6	-301,537.50	Yr seven of employing an expat	2023
7	-301,537.50	Yr eight of employing an expat	2024
8	-301,537.50	Yr nine of employing an expat	2025
9	-301,537.50	Yr ten of employing an expat	2026
10	-301,537.50	Yr eleven of employing an expat	2027
11	-301,537.50	Yr twelve of employing an expat	2028
12	-301,537.50	Yr thirteen of employing an expat	2029
13	-301,537.50	Yr fourteen of employing an expat	2030
14	-301,537.50	Yr fifteen of employing an expat	2031
15	-301,537.50	Yr sixteen of employing an expat	2032
16	-301,537.50	Yr seventeen of employing an expat	2033
Output:			
NPV	-USD 3,012,004.18		

Role 3: Production and Maintenance Manager

NPV calculations for one local for the Production and Maintenance Manager role is shown in Table D-10.

Table D-10: Production and Maintenance Manager local NPV calculations

Local NPV			
Interest Rate	13.04%	<i>2018 Ghanaian weighted average cost of capital of Oil/Gas (E&P) sector - 13.04%</i>	
Initial Investment	13,296.66	First year of university	2011
Net Cash Flows			
1	-13,296.66	Second year of uni	2012
2	-22,255.60	Third year of uni, and ELT	2013
3	-52,270.00	Yr one of employment in Ghana.	2014
4	-52,270.00	Yr two of employment in Ghana.	2015
5	-353,807.00	Yr three of employment in Ghana. And one expat hired.	2016
6	-342,951.00	Yr four of employment in Ghana. And one expat hired at 7.76%.	2017
7	-332,614.00	Yr five of employment in Ghana. And one expat hired at 7.76%	2018
8	-322,772.00	Yr six of employment in Ghana. And one expat hired at 7.76%	2019
9	-410,292.38	Yr seven of employment in Ghana. Incl. all training. And one expat hired at 7.76%	2020
10	-368,470.00	Yr eight of employment, international. And one expat hired at 7.76%	2021
11	-359,953.00	Yr nine of employment, international. And one expat hired at 7.76%	2022
12	-351,832.00	Yr ten of employment, international. And one expat hired at 7.76%	2023
13	-344,086.00	Yr eleven of employment, international. And one expat hired.	2024
14	-336,694.00	Yr twelve of employment, international. And one expat hired.	2025
15	-106,279.00	Yr thirteen of employment in Ghana	2026
16	-106,279.00	Yr fourteen of employment in Ghana	2027
17	-106,279.00	Yr fifteen of employment in Ghana	2028
18	-106,279.00	Yr sixteen of employment in Ghana	2029
19	-106,279.00	Yr seventeen of employment in Ghana	2030
20	-106,279.00	Yr eighteen of employment in Ghana	2031
21	-106,279.00	Yr nineteen of employment in Ghana	2032
Output:			
NPV	-USD 1,362,315.16		

NPV calculations for one expatriate for the Production and Maintenance Manager role is shown in Table D-11.

Table D-11: Production and Maintenance Manager expatriate NPV calculations

Expatriate NPV			
Interest Rate	7.76%	<i>2018 Italian weighted average cost of capital of Oil/Gas (E&P) sector - 7.76%</i>	
Initial Investment	301,537.50	Yr one of employing an expat	2017
Net Cash Flows			
1	-301,537.50	Yr two of employing an expat	2018
2	-301,537.50	Yr three of employing an expat	2019
3	-301,537.50	Yr four of employing an expat	2020
4	-301,537.50	Yr five of employing an expat	2021
5	-301,537.50	Yr six of employing an expat	2022
6	-301,537.50	Yr seven of employing an expat	2023
7	-301,537.50	Yr eight of employing an expat	2024
8	-301,537.50	Yr nine of employing an expat	2025
9	-301,537.50	Yr ten of employing an expat	2026
10	-301,537.50	Yr eleven of employing an expat	2027
11	-301,537.50	Yr twelve of employing an expat	2028
12	-301,537.50	Yr thirteen of employing an expat	2029
13	-301,537.50	Yr fourteen of employing an expat	2030
14	-301,537.50	Yr fifteen of employing an expat	2031
15	-301,537.50	Yr sixteen of employing an expat	2032
16	-301,537.50	Yr seventeen of employing an expat	2033
Output:			
NPV	-USD 3,012,004.18		

Role 4: Negotiations and Business Development Manager

NPV calculations for one local for the Negotiations and Business Development Manager role is shown in Table D-12.

Table D-12: Negotiations and Business Development Manager local NPV calculations

Local NPV			
Interest Rate	13.04%	2018 Ghanaian weighted average cost of capital of Oil/Gas (E&P) sector - 13.04%	
Initial Investment	13,296.66	First year of university	2014
Net Cash Flows			
1	-13,296.66	Second year of uni	2015
2	-22,255.60	Third year of uni, and ELT	2016
3	-353,807.00	Yr one of employment in Ghana. And one expat hired at 7.76%	2017
4	-342,951.00	Yr two of employment in Ghana. And one expat hired at 7.76%	2018
5	-396,623.00	Yr three of employment, international. And one expat hired at 7.76%	2019
6	-386,781.00	Yr four of employment, international. And one expat hired at 7.76%	2020
7	-377,404.00	Yr five of employment, international. And one expat hired at 7.76%	2021
8	-407,974.81	Yr six of employment, international. Incl. all training. And one expat hired at 7.76%	2022
9	-359,953.00	Yr seven of employment, international. And one expat hired at 7.76%	2023
10	-351,832.00	Yr eight of employment, international. And one expat hired at 7.76%	2024
11	-344,083.00	Yr nine of employment, international. And one expat hired at 7.76%	2025
12	-336,694.00	Yr ten of employment, international. And one expat hired at 7.76%	2026
13	-106,279.00	Yr eleven of employment in Ghana	2027
14	-106,279.00	Yr twelve of employment in Ghana	2028
15	-106,279.00	Yr thirteen of employment in Ghana	2029
16	-106,279.00	Yr fourteen of employment in Ghana	2030
17	-106,279.00	Yr fifteen of employment in Ghana	2031
18	-106,279.00	Yr sixteen of employment in Ghana	2032
19	-106,279.00	Yr seventeen of employment in Ghana	2033
Output:			
NPV	-USD 1,708,057.39		

NPV calculations for one expatriate for the Negotiations and Business Development Manager role is shown in Table D-13.

Table D-13: Negotiations and Business Development Manager expatriate NPV calculations

Expatriate NPV			
Interest Rate	7.76%	<i>2018 Italian weighted average cost of capital of Oil/Gas (E&P) sector - 7.76%</i>	
Initial Investment	301,537.50	Yr one of employing an expat	2017
Net Cash Flows			
1	-301,537.50	Yr two of employing an expat	2018
2	-301,537.50	Yr three of employing an expat	2019
3	-301,537.50	Yr four of employing an expat	2020
4	-301,537.50	Yr five of employing an expat	2021
5	-301,537.50	Yr six of employing an expat	2022
6	-301,537.50	Yr seven of employing an expat	2023
7	-301,537.50	Yr eight of employing an expat	2024
8	-301,537.50	Yr nine of employing an expat	2025
9	-301,537.50	Yr ten of employing an expat	2026
10	-301,537.50	Yr eleven of employing an expat	2027
11	-301,537.50	Yr twelve of employing an expat	2028
12	-301,537.50	Yr thirteen of employing an expat	2029
13	-301,537.50	Yr fourteen of employing an expat	2030
14	-301,537.50	Yr fifteen of employing an expat	2031
15	-301,537.50	Yr sixteen of employing an expat	2032
16	-301,537.50	Yr seventeen of employing an expat	2033
Output:			
NPV	-USD 3,012,004.18		

Role 5: Well Operations Manager

NPV calculations for one local for the Well Operations Manager role is shown in Table D-14.

Table D-14: Well Operations Manager local NPV calculations

Local NPV			
Interest Rate	13.04%	<i>2018 Ghanaian weighted average cost of capital of Oil/Gas (E&P) sector - 13.04%</i>	
Initial Investment	13,296.66	First year of university	2014
Net Cash Flows			
1	-13,296.66	Second year of uni	2015
2	-22,255.60	Third year of uni, and ELT	2016
3	-353,807.00	Yr one of employment in Ghana. And one expat hired at 7.76%	2017
4	-342,951.00	Yr two of employment in Ghana. And one expat hired at 7.76%	2018
5	-332,614.00	Yr three of employment in Ghana. And one expat hired at 7.76%	2019
6	-322,772.00	Yr four of employment in Ghana. And one expat hired at 7.76%	2020
7	-412,758.65	Yr five of employment in Ghana. Incl. all training. And one expat hired at 7.76%	2021
8	-368,470.00	Yr six of employment, international. And one expat hired at 7.76%	2022
9	-359,953.00	Yr seven of employment, international. And one expat hired at 7.76%	2023
10	-351,832.00	Yr eight of employment, international. And one expat hired at 7.76%	2024
11	-344,083.00	Yr nine of employment, international. And one expat hired at 7.76%	2025
12	-336,694.00	Yr ten of employment, international. And one expat hired at 7.76%	2026
13	-106,279.00	Yr eleven of employment in Ghana	2027
14	-106,279.00	Yr twelve of employment in Ghana	2028
15	-106,279.00	Yr thirteen of employment in Ghana	2029
16	-106,279.00	Yr fourteen of employment in Ghana	2030
17	-106,279.00	Yr fifteen of employment in Ghana	2031
18	-106,279.00	Yr sixteen of employment in Ghana	2032
19	-106,279.00	Yr seventeen of employment in Ghana	2033
Output:			
NPV	-USD 1,642,870.38		

NPV calculations for one expatriate for the Well Operations Manager role is shown in Table D-15.

Table D-15: Well Operations Manager expatriate NPV calculations

Expatriate NPV			
Interest Rate	7.76%	2018 Italian weighted average cost of capital of Oil/Gas (E&P) sector - 7.76%	
Initial Investment	301,537.50	Yr one of employing an expat	2017
Net Cash Flows			
1	-301,537.50	Yr two of employing an expat	2018
2	-301,537.50	Yr three of employing an expat	2019
3	-301,537.50	Yr four of employing an expat	2020
4	-301,537.50	Yr five of employing an expat	2021
5	-301,537.50	Yr six of employing an expat	2022
6	-301,537.50	Yr seven of employing an expat	2023
7	-301,537.50	Yr eight of employing an expat	2024
8	-301,537.50	Yr nine of employing an expat	2025
9	-301,537.50	Yr ten of employing an expat	2026
10	-301,537.50	Yr eleven of employing an expat	2027
11	-301,537.50	Yr twelve of employing an expat	2028
12	-301,537.50	Yr thirteen of employing an expat	2029
13	-301,537.50	Yr fourteen of employing an expat	2030
14	-301,537.50	Yr fifteen of employing an expat	2031
15	-301,537.50	Yr sixteen of employing an expat	2032
16	-301,537.50	Yr seventeen of employing an expat	2033
Output:			
NPV	-USD 3,012,004.18		