“Identifying and responding to the challenge of staffing remote rural areas with health workers in middle and low income countries: the case of Sudan”

‘A thesis submitted to The University of Manchester for the degree of doctor of philosophy (PhD) in the Faculty of Humanities’

2014

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List of abbreviations

ABDG: African Development Bank Group
AHS: Academy of Health Sciences
AHV: Assistant Health Visitor
ANC: Antenatal Care
CB of S: Central Bureau of Statistics
CHW: Community Health Worker
CMOCs: Context Mechanism Outcome Configurations
EmOC: Emergency Obstetric Care
EMRO: Regional Health Systems Observatory
FMOH: Federal Ministry of Health
GDP: Growth Domestic Product
GP: General Practitioner
HBA: Home Birth Attendants
HIV: Human Immunodeficiency Virus
HMN: Health Metrics Network
HV: Health Visitor
JICA: Japan International Cooperation Agency
MDGs: Millennium Development Goals
MMR: Maternal Mortality Ratio
NHIF: National Health Insurance Fund
NGO: Nongovernmental Organisation
NMW: Nurse Midwife
PHI: Public Health Institute
SBA: Skilled Birth Attendants
SDG: Sudanese Pounds
SHS: Sudan Household Survey
SMOH: State Ministry of Health
TBAs: Traditional Birth Attendants
TMW: Technical Midwife or Midwifery Technician
UN: United Nations
UNFPA: United Nation Population Fund
VMW: Village Midwife
WHO: World Health Organisation
Abstract

The University of Manchester

A thesis submitted by Tarig Ali Suliman Ali to The University of Manchester for the degree of doctor of philosophy (PhD) in the Faculty of Humanities, July 2014.

Identifying and responding to the challenge of staffing remote rural areas with health workers in middle and low income countries: the case of Sudan

Staffing remote rural areas with health workers is one of the main challenges facing middle and low income countries looking to achieve the Millennium Development Goals including reducing the maternal death rate. Sudan is an African low income country faced with a shortage of health workers. This shortage is coupled with a misdistribution of health workers. Most of the doctors and specialists prefer to work in the capital Khartoum. However, in the last few years, Sudan has succeeded in reducing maternal death. This research aimed to undertake a realistic evaluation of the key strategies adopted by the Sudanese government to staff remote underserved areas by health workers. A literature review followed by documentary analysis aided the construction of two separate but interconnected attraction and retention frameworks and the development of the context- mechanism- outcome-configurations (CMOCs) related to staffing remote rural areas with maternal health workers. Next, qualitative semi-structured interviews were conducted in order to test these CMOCs. The interviewees included policy makers, executive health managers and health workers, both those currently working in rural areas and those who had done so in the past.

The findings are presented with respect to identified CMOCs and the proposed attraction and retention frameworks. The findings have been presented in the form of what works, what does not, how, for whom and under what circumstances. The findings were analysed and discussed with respect to the relevant literature to facilitate development of recommendations which need to be considered to achieve better staffing of rural health facilities. This research has explained the past and current initiatives adopted by the Sudanese government to staff underserved areas with maternal health workers. It also showed how the “context” affected the success or failure of these strategies. This research is useful for other low income countries that suffer from inequitable distribution of its health workforce. The research has contributed to new understanding by developing separate attraction and retention frameworks for doctors and midwives. In addition to that effective interventions which are found in Sudan but not previously found in the literature have been identified and summarised.
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Tarig Ali did his first degree in economics and social statistics at the University of Khartoum in 1994. In 1999 he obtained a post graduate diploma in planning from the same university. Tarig joined the National Health Insurance Fund in Sudan in 2002. In 2005 Tarig was selected amongst 20 senior staff to read for a post graduate diploma in health systems management in Khartoum. This overseas programme was organised and approved by Liverpool School of Tropical Medicine. In 2007 the researcher obtained MSc in Statistics from Alneelain University before gaining MSc Healthcare Management in 2009 from the University of Manchester/Manchester Business School.

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Chapter one: Introduction

1.1. Background

Trained, skilled and motivated health workers are essential to delivering high-quality healthcare (WHO, 2006). Policy makers in the health sector are always looking for ways to improve the staffing of rural health facilities by attracting health workers to rural areas and retaining them. However, low income countries often find it harder to achieve a balanced distribution of their health workforce. The reasons behind this are that these countries have severe shortages of health personnel and large rural populations and presumably a shortage of funds or taxable base or low GDP from which to invest in public healthcare (WHO, 2010).

The attraction and retention of health workers in remote and rural areas is subject to two interrelated aspects: the factors that determine whether or not health workers will stay in rural health facilities, and the policies and strategies adopted by policy makers in response to these factors (Lehmann et al., 2008). The literature describes many factors that explain why health workers decide to stay in or leave rural and remote areas. These include personal and family factors, working and living conditions, career-related factors, financial aspects and mandatory rural service (Henderson and Tulloch, 2008).

The shortage of health workers in remote rural areas is the main obstacle to low income countries’ achievement of the Millennium Development Goals (MDGs), including reducing the maternal mortality ratio (MMR) by 75% by the year 2015 (Dieleman et al., 2009). Reducing the maternal mortality cannot be achieved while basic services such as antenatal and postnatal care are lacking, nor with the current unavailability of skilled birth attendants, especially in remote rural areas where maternal deaths are higher (F.M.O.H, 2009a; F.M.O.H, 2009b). These services in turn cannot be provided in the absence of qualified maternal health professionals. Lack of health professionals in rural areas leads to delay in seeking care until the patient’s condition deteriorates or worsens (Ebuehi et al., 2011). Moreover, the World Health Report (2006) reflects the significant correlation between health outcomes and the number of health workers. Generally, the workforce is essential for enabling successful public health interventions (Nelson et al., 2013). This research shows that better health outcomes are always being reported in countries with better staffed health facilities.
During the last few years, the Sudanese government has succeeded in achieving remarkable progress in improving maternal health and reducing the MMR. The latter improved from 559 per 100,000 live births in 2000 to 186 in 2011 (F.M.O.H, 2012a). This progress may be due to the bundle of interventions that have been adopted by Sudan’s government in response to the challenge of staffing remote rural areas with health workers in general but maternal health workers in particular. These interventions have come not only from the Ministry of Health but also from the National Health Insurance Fund (NHIF), which is aiming to achieve universal coverage for the whole Sudanese population. Hence, this research will focus on the strategies and interventions that have been adopted for the staffing of rural areas so as to provide maternal health services and reduce maternal mortality. These strategies have been identified through a literature review of strategies related to staffing remote rural areas with health workers, combined with Sudanese policy documents on human resources for health and maternal health. This focuses on the main interventions that are expected to have a positive impact on staffing rural areas and improving maternal health outcomes in rural and underserved areas. These interventions include training, financial incentives, recruitment, regulatory interventions, task shifting, interventions related to working and living conditions, community-related interventions, supervision and human resources management interventions. In the next section the researcher will outline the main objectives of this research along with the research questions.

1.2. Research objectives

1- To apply the realist evaluation to the key initiatives aimed at staffing rural areas of Sudan with a maternal health workforce.

2- To provide an overview, with refined explanations, of the key initiatives employed by the Sudanese health sector organisations to staff rural areas with maternal health workers.

3- To explain the importance of the “context” to the success or failure of an intervention by shedding light on what works, what does not, for whom and under what circumstances.
1.3. Research questions

1- What are the past and current initiatives that have been adopted by the Sudanese government to staff underserved areas with maternal health workers?
2- How has the “context” affected the success or failure of these strategies?
3- What are the recommendations that could help Sudan to achieve a balanced distribution of its maternal health workforce?

1.4. The structure of the thesis

This thesis is composed of seven chapters; the first one is this introductory chapter which mainly provides the background to the rationale of this research, research objectives, research questions, and an overview of the research process.

Chapter two

This chapter provides literature about the challenge of staffing remote rural areas in middle and low income countries. This part attempts to outline the issue of human resources for health and the bad consequences of the shortage of health workers in low income countries. In the second part of this chapter, the researcher consults the literature related to motivation theories in order to understand what motivates the workforce and factors that affect their mobility.

Accordingly, the researcher has provided literature about human motivation theory. This includes labour economics theories, Maslow’s hierarchy of needs, Herzberg theory, Alderfer’s ERG theory, Henderson and Tulloch’s motivation and retention framework. Each of these theories and models provide respectable principles for better understanding of the motivators related to workforce. However, Henderson and Tulloch’s framework seemed to be the appropriate framework for understanding the factors related to motivation and retention of health workers. Accordingly the researcher has adopted this framework with minor modifications.

In the third part of this chapter, the researcher has consulted the literature related to staffing remote rural areas with health workers with special focus on middle and low income countries. The purpose of this part of the literature is to develop hypotheses related to staffing remote rural areas with health workers. These propositions will be in
the form of Context Mechanism Outcome Configurations (CMOCs) (Pawson, 2013; Pawson and Tilley, 1997).

Given that the focus of this research is on staffing remote rural areas with maternal health workers in order to reduce maternal mortality, the literature on human resources management interventions related to reduction of maternal mortality has been reviewed in the fourth part of chapter two. The aim of this part is to examine the literature related to staffing remote rural areas with maternal health workers and to develop hypotheses related to human resources for maternal health interventions.

**Chapter three**

This chapter provides contextual information about Sudan where the empirical field work took place. The first part of this chapter provides information about socio-economic factors necessary to understand the general context of the country. The chapter includes information about the health system and financing of health services. This includes information about the two main public health organisations related to the provision of healthcare services to the Sudanese population. These organisations are the Ministry of Health and the National Health Insurance Fund.

The next section provides information about Maternal Mortality Ratio in Sudan. This information reflects the significant improvement in reducing maternal mortality in the last ten years. Given that the researcher is interested in developing hypotheses related to staffing remote rural areas with health workers, the researcher tries to link the initial propositions which have developed from the literature review with Sudanese policy documents on human resources related to the reduction of maternal mortality in Sudan. These documents include human resources management strategies and reproductive health policy road maps related to reduction of maternal mortality in the last ten years. This method has helped the researcher in developing CMOCs related to staffing remote rural areas with health workers and reducing maternal mortality in Sudan.

**Chapter four**

This chapter reflects the methodological foundation of this research. Accordingly this chapter outlines the Realist Evaluation firstly developed by Pawson and Tilly in 1997. This method focuses on understanding not only what works and what doesn’t, but also how and under what circumstances. The researcher outlines data collection methods and methodology. This is followed by reflection on the empirical field work which has been
carried out in Sudan. In this chapter the researcher has also outlined and justified his chosen methodology.

**Chapter five**

This chapter presents the findings from the field work. These findings are presented with respect to the developed attraction and retention framework and with respect to the developed CMOCs. These findings are classified in aspects related to financial incentives, recruitment, deployment mechanisms, mandatory service, working conditions, living conditions, training and educational related interventions.

**Chapter six**

This chapter discusses the findings of this research by linking them to the relevant literature. This discussion chapter presents reflections on the main findings showing how they are important. This discussion facilitates the development of suggestions and recommendations that need to be considered by Sudanese health sector organisations along with policy makers.

**Chapter seven**

Finally the researcher summarises this research with the main implications of this study. This is followed by recommendations which come from the discussion of research findings in light of the literature review and other literature not included when writing the literature review chapter.

**1.5. Summary of the research process:**

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<tbody>
<tr>
<td>Activity</td>
<td>reviewing the literature about human resources management interventions related to reduction of maternal mortality.</td>
</tr>
<tr>
<td>Result</td>
<td>CMOCs related to staffing remote rural areas with maternal health workers and</td>
</tr>
</tbody>
</table>
### Stage three: link these CMOCs with the Sudanese policy documents related to maternal health workers and human resources interventions to reduce MMR.

**Activity:** reviewing Sudanese policy documents related to maternal health workers and human resources interventions to reduce MMR.

**Result:** CMOCs related to staffing Sudan remote rural areas with maternal health workers and reduction of maternal mortality in the country.

### Stage four: test the developed CMOCs

**Activities:**
- Interviews with health managers at federal and state levels in Sudan
- Interviews with front liners from different professions related to maternal health in Sudan

**Result:** forty one interviews conducted with the targeted respondents

### Stage five: refine the CMOCs

**Activity:** thematic analysis of the data with respect to the CMOCs

**Result:** refined CMOCs with respect to the realist enquiry of what works, what doesn’t, how and under what circumstances

### Stage six: discussing the findings

**Activity:** discussing the results with respect to the relevant literature

**Result:** the discussed findings
Chapter two: Literature Review

2.1. Introduction

Fifty seven countries have been identified by the WHO as having a severe shortage of health workers worldwide, of which 36 countries are in Africa (WHO, 2010; Dolea et al., 2009). This shortage paradoxically exists with high unemployment rates amongst health workers particularly mid-level cadres. Many global health initiatives tend to be announced from time to time; one example is MDGs including reducing MMR by three quarters by the year 2015 (Humphreys et al., 2007). However, these initiatives will not be successful in the absence of health workers to provide the required services. Those health workers are the persons who make the health happen (Ebuehi et al., 2011).

Policy makers in the health sector are always looking for ways to improve the staffing of rural health facilities by increasing the number of qualified health workers. However, low-income countries are considered to find it harder to achieve a balanced distribution of their health workforce (Lehmann et al., 2008; Dieleman et al., 2009). The reasons behind this are that these countries have severe shortages of health personnel and large rural populations (WHO, 2010). Also limited resources in low income countries hinder the rapid production of health workers (Chhea et al., 2010). Rural areas can be defined as large, isolated areas of a country, often with low population densities and relatively poor infrastructure (WHO, 2010). Remote rural communities always suffer from higher rates of poverty than their urban counterparts (Munslow and O'Dempsey, 2010). Trained, skilled and motivated health workers are essential to delivering high-quality healthcare services. The shortage of health workers in remote rural areas represents the main obstacle to low-income countries achieving the Millennium Development Goals (MDGs) (Bourgain et al., 2009).

The number of health workers is an indicator of a health system’s ability to deal with the healthcare needs of its population. Developing countries always experience an urban bias that negatively affects the rural areas in terms of the number and type of health workers allocated, which in turn affects the accessibility of health services (WHO, 2010). The health worker / patient indicator is generally lower in rural areas worldwide than in urban areas (WHO, 2010). The implications of this are considered to be most
severe in low-income countries resulting in low access to healthcare services and consequently low utilization rates (WHO, 2010). Generally, staff shortages are the most commonly reported staff-related problem, especially in remote areas within developing countries (WHO, 2006).

According to Lehmann et al (2008), there are serious disparities between the levels of care provided in urban and rural areas. One of the main reasons for rural urban migration is that people want to gain access to medical care from qualified medical staff with better equipment which is likely to be available in urban areas. Shortages of health professionals lead to unsuitable skills and mixtures of staff along with imbalanced distribution (Fahey and Monaghan, 2005). Lexomboon (2003), suggests that this could lead to rural areas being served by inexperienced staff. Moreover, the evidence suggests that there is a positive correlation between health indicators and the density of health workers in a specific area (Chen et al., 2004) The impact of an uneven distribution of physicians and other healthcare staff on healthcare delivery in rural areas is profound. Primary healthcare facilities can end up being staffed completely by untrained medical personnel (Lehmann et al., 2008; Gerein et al., 2006).

The main challenge for low income countries including sub Saharan African countries is to train the targeted health workers, deploy them into underserved areas, and ensure that effective motivation and retention mechanisms are functioning (Bourgain et al., 2009). The low income countries are faced with shortages coupled with misdistribution of health workers. In addition, these countries are facing real challenges in producing and training, recruiting and paying regular salaries, and retaining health workers. The main reasons for leaving specific posts include poor working conditions and equipment along with lack of supervision (Lehmann et al., 2008; Garces et al., 2012; Bourgain and Zou, 2009). The main challenges which face African health systems are the training and deployment of health workers along with motivating and retaining them in the underserved areas (Mathauer and Imhoff, 2006).

This chapter consists of six sections. Following this introduction, the second section will outline the main aims and objectives of the literature review. The general background about the issue of human resources for health in middle and low income countries will be outlined in the third section. In the fourth section the main theories and models related to health workforce mobility will be outlined and summarised. Factors and strategies related to staffing remote rural areas with health workers will be
identified and summarised in the fifth section. As the researcher is intending to link this broad topic with specific health issues in order to be able to focus on specific categories of health workers, accordingly the last section will be assigned to outlining the issues related to human resources for maternal health.

2.2. Aims and methods of the literature review

The aim of this literature review is to provide a background to the theoretical foundation of this research with respect to the following objectives:

- To provide an overview of the challenge of staffing remote rural areas with health workers in low income countries.
- To provide an overview of models and frameworks related to workforce mobility.
- To review and analyse the factors and strategies related to staffing remote rural areas with health workers.
- To summarize and analyse the knowledge about the staffing of remote rural areas in low income countries.
- To develop propositions related to staffing remote rural areas with health workers.

This research presents a literature review on staffing remote rural areas with health workers with particular focus on low income countries. The researcher is keen to draw the evidence from recent literature because the recent literature is expected to help the researcher identify the latest developments in the research area; accordingly the search was limited to 2000-2013. To identify those articles that describe the factors and strategies related to staffing remote rural areas in low income countries, an extensive search was conducted. The research process included various English language database searches using the key words such as “staffing remote rural areas with health workers”, “retention in rural areas” and “health workers retention”. These data-bases include Scopus; Google Scholar; Zetoc; PubMed; Science direct; World Health Organisation web-site. Non-English language publications were excluded. The articles chosen were deemed to have more focus on different issues related to staffing remote rural areas with health workers in low income countries.
Evidence from some high income countries have been included in this review; this is expected to provide additional information which raises issues that are not recognised in middle and low income countries. However, when the founded articles address similar issues, the researcher selected the ones that focus on low income countries. The reason is that the empirical work will take place in a low income country; hence experiences from similar contexts might be more useful in building the initial hypothesis related to staffing remote rural areas with health workers. The researcher has chosen this selective method because the main focus is an empirical study. This criterion was selected because it fits the requirements of the intended evaluation (see the methodology chapter in section 4). Accordingly the search continues till the stated aims and objectives of the literature review have been achieved. One of these objectives is to facilitate the development of propositions in the form of CMOCs related to staffing remote rural areas with health workers.

Later, the researcher decided to link this broad topic to specific health issues in order to focus on a specific category of health workers. The researcher has chosen to focus on maternal health workers. Reducing maternal mortality by 75% by the year 2015 is one of the main targets of MDGs. Accordingly, it will be appropriate to review literature related to human resources interventions for maternal health in general and to reduce maternal mortality in particular. Accordingly, another literature search was conducted with the same data-bases identified in the previous section with words such as “human resources for maternal health”, “midwifery workers to reduce maternal mortality”, “shifting tasks for maternal health”, “emergency obstetrics care in low income countries”, “training of midwives in low income countries”. The researcher focused on articles that pay more attention to middle and low income countries. Maternal health articles from high income countries have been excluded. The researcher stopped when he felt that the key issues had been identified and the relevant hypotheses and propositions related to HRH intervention to reduce maternal mortality had been developed.

Some articles have been identified through a snowball method from the reference list of other articles related to human resources for health. The overall selected articles and sources in the two searches are 133 excluding Sudanese policy documents which have been included in a separate chapter. The researcher has extracted from these articles findings related to different strategies associated with staffing remote rural areas with
health workers. The researcher also has tried to identify the main challenges that face effective implementation of these strategies. Some of those materials could be considered as landmark sources meaning that they help in identifying the main theoretical foundations of this research. These articles have been summarised in table (1).
Table 1  Landmark literature sources which help in identifying the main theoretical foundations of this research

<table>
<thead>
<tr>
<th>Author (year)</th>
<th>Title</th>
<th>Method</th>
<th>Main findings</th>
</tr>
</thead>
</table>
| Lehman et al., 2008 | Staffing remote rural areas in middle- and low-income countries: A literature review of attraction and retention | Narrative literature review on articles published between 1997 and 2007 | * Strategies should be adopted after identifying the factors related to attraction and retention of health workers.  
* Many of the strategies that have been adopted by different countries actually focus on a limited number of factors.  
*One intervention can’t make a difference in staffing remote rural areas. Only bundle of interventions are likely to make difference. |
<p>| Hoope-Bender et al., (2006) | Human resources and access to maternal health care | Review article | Policy makers should consider financial incentives, career related interventions, supportive supervision, and in addition to that community involvement could play a role. Human resources planning is essential to reduce maternal mortality. |
| Henderson and Tulloch (2008) | Incentives for retaining and motivating health workers in Pacific and Asian countries | Review article | The authors become able to develop a framework related to motivation and retention of health workers.                                                                                                      |
| World Health Organisation (2010) | Increasing access to health workers in remote and rural | WHO report | The authors suggest a package of interventions to address attraction and retention of health workers to rural areas.                                                                                           |</p>
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>Methodology</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borjas and van Ours (2006)</td>
<td>Labour economics</td>
<td>Text book</td>
<td>This study focuses mainly on labour economics, and specifically, labour supply, demand and labour mobility. The author explains labour market theory, which emphasizes the role of economic returns in driving workers’ movements. It shows that the supply side, represented by employees, is highly affected by the wages provided by employers, who represent the demand side.</td>
</tr>
<tr>
<td>Dubois, C. A. and Singh, D. (2009).</td>
<td>From staff-mix to skill-mix and beyond: towards a systemic approach</td>
<td>Systematic review</td>
<td>* Policy makers try to optimize their utilization of health professionals and medical staff in order to achieve the right mix of staff, so as to achieve a high standard of care and deliver the best quality of service possible.</td>
</tr>
<tr>
<td>Author</td>
<td>Title</td>
<td>Research Type</td>
<td>Summary</td>
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<tr>
<td>------------------------</td>
<td>-----------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Lexomboon, D. (2003).</td>
<td>Recruitment and Retention of Human Resources for Health in Rural Areas: A case Study of Dentists in Thailand</td>
<td>PhD Research</td>
<td>This study looks at a middle-income country, showing how dentists in Thailand decide whether or not to stay in a specific post, depending on whether the post is rural or urban. It shows that such decisions are associated with different factors. Some of these factors are individual factors while others are related to the work environment and their relationships with managers and colleagues. It shows that the implementation of compulsory services in rural areas has strongly encouraged Thailand’s dentists to work in rural areas.</td>
</tr>
</tbody>
</table>
| Dieleman et al (2011)  | Realist review and synthesis of retention studies for health workers in rural and remote areas | Realist review and synthesis | *Tasks may be shifted to lower level health workers.  
*Contextual factors need to be considered when transferring successful intervention amongst countries.  
*what works in developed countries is not necessarily going to work in developing countries.  
* Realist evaluation and realist synthesis gains a deeper understanding in the working of interventions and aids the construction and testing of propositions. |
In the following section the researcher will provide a general background to the main issues related to health systems in middle and low income countries including problems related to human resources for health.

2.3. Human resources for health

The World Health Report 2000 defines HRH as ‘the stock of all individuals engaged in the promotion, protection or improvement of population health’ (WHO, 2000). Spending on the health workforce represents more than 60% of the total running costs of health systems worldwide (Buchan and Dal Poz, 2002). According to the World Health Organization (WHO) (2006), skilled human resources are essential in providing a health service that diagnoses, treats and prevents illness and promotes population health and the key to effective and efficient health services. Lack of health professionals in rural areas leads to delay in seeking care until the disease is advanced resulting in bad consequences (Ebuehi et al., 2011).

Human resources represent the backbone of health systems including the delivery of health services (FIGO, 2009). Health workers deployed to health facilities should be trained, skilled, motivated and willing to help the communities by providing a high quality of healthcare (WHO, 2010). Both developed and developing countries suffer from a shortage of health workers; however the shortage in developing countries is more severe especially in Sub-Saharan African countries. These Sub-Saharan countries have been advised to triple their health workforce in order to be capable of achieving the millennium development goals (Dubois and Singh, 2009). The ability of any health system to provide healthcare services for its population depends on its ability to sustain a trained, skilled and motivated health workforce in all its health facilities (Dubois and Singh, 2009). There is a relation between the density of health workers and health indicators; in Ghana for example under-five mortality has been recorded higher in rural areas with a shortage of health workers (Adzei and Atingga, 2012). However, low income countries lack the capacity to respond to all health problems (O'Dempsey and Munslow, 2009).

According to the WHO (2010), the shortage of health workers is estimated to be around four million worldwide. The shortage in low income countries is more severe than in high income countries. In many African countries the total health workforce needs to double in order to overcome the shortage (Bourgain et al., 2009). For example, sub
Saharan countries need to increase their health workers by 140%. The impact of this shortage will definitely affect health systems performance including maternal health. This will appear in indicators such as Maternal Mortality Ratio (Henderson and Tulloch, 2008; Filippi et al., 2006; Fauveau et al., 2008). The literature confirms the linear relationship between health workers’ indicators and the health outcomes (Henderson and Tulloch, 2008; Chen et al., 2004).

Countries with high health workers/population ratios and appropriate skill mix always have better healthcare services and hence better health outcomes. In these conditions highly skilled personnel tend to migrate from low income countries to high income countries because of wage differences (Bourgain and Zou, 2009). Low income countries suffering a shortage of financial resources prevent their government from paying good salaries to health workers; this indicates that the shortage of health professionals should be addressed for all countries; increasing the production of health workers in low income countries solely will not solve the problem, because these health workers tend to migrate to fill the gaps where they are paid well (Lehmann et al., 2008).

Many low income countries have started to invest in producing mid-level cadre who are less likely to migrate and have a high tendency to work in remote and rural areas (Henderson and Tulloch, 2008). However, producing health workers and deploying them to rural areas without providing them with the required skills, equipment, and supportive supervision and in service training is unlikely to make a difference. Some of the low income countries have been successful in training and producing respectable numbers of qualified health professionals; however, these countries always failed to retain them inside the country. The problem of highly skilled personnel is that they are likely to migrate outside the country for many reasons including wage difference between the source and the recipient countries. Also these health workers are in demand more than the mid-level cadres (Dovlo, 2004).

In some low income countries health workers may rely on other sources of income in addition to their regular salaries. Health workers may rely on user fees or private practices in order to compensate for low public salaries. For example 80% of Cambodian public health workers have at least one additional source of income besides the governmental income (Henderson and Tulloch, 2008). Problems of health workers who work in remote rural areas within low income countries include; poor living and working conditions, ineffective communication and transportation systems, lack of an
effective system which is capable of replacing consumables and supplies on time (Henderson and Tulloch, 2008). These consumables and supplies are necessary for saving people’s lives. Other problems associated with health systems in low income countries are that health workers who are deployed to some remote rural areas might be forgotten for years without being replaced by others; hence, health workers may become fearful of an unspecified placement to remote and rural areas (Henderson and Tulloch, 2008). Decentralization of health systems has resulted in bad consequences particularly in weakening the central managerial mechanisms. Decisive functions relevant to decision making and monitoring and evaluation have been transferred to local authorities. As a result, decisions related to financial resources have been affiliated to local health authorities causing variations in rewarding criteria including salaries and incentives (Rigoli and Dussault, 2003).

In this section the researcher has outlined the main issues related to health systems in middle and low income countries including problems related to HRH. These issues can be summarised in the following points:

- Shortage of health workers is a challenge facing both developed and developing countries. However, this shortage is more severe with bad consequences in low income countries.
- Shortage of financial resources prevents low income countries from creating a conducive environment to retain their health workforce.
- Decentralisation of health systems in low income countries has negatively affected equitable distribution of highly skilled health workers.

In the next section the researcher will outline the literature review findings related to the theories and models associated with workforce mobility. The aim of this part is to explore these models in order to identify which of them provide a better understanding of health workforce mobility. The researcher is aiming to select a solid and comprehensive framework to provide a better understanding of factors related to attraction and retention of the health workforce.

2.4. Theories and models related to workforce mobility

The literature describes several models and theories which try to explain workforce mobility. In this section the researcher will try to provide an overview of these theories and models related to workforce motivation, satisfaction, and retention. Understanding the workforce is important as a better understanding of health workers may help
decision makers to adopt appropriate strategies that respect their needs, motivation and retention factors. These theories and models include labour economic theories, Maslow’s hierarchy of needs, Herzberg’s motivation theory, Alderfer’s model along with the Henderson and Tulloch framework. The latter is considered to be more appropriate in providing a better understanding of factors related to motivation and retention of a health workforce.

2.4.1. Labour economics theories

These theories such as Neoclassical Wage Theory try to show that the financial aspects are the main motivators affecting workforce mobility (Borjas and van Ours, 2006). These theories are based on the assumptions that the labour market is ruled by perfect competition and these workers are able to change their locations when they want (Gong and Van Soest, 2002). Neoclassical Wage Theory assumes that labour moves from low income countries to high income countries due to the wage difference. These theories have been criticised for ignoring non-economic factors in interpreting the movement of migrants between countries and amongst countries (Arango, 2000). Financial aspects are not the only motives for workforce mobility. Other criticisms include that this theory is based on considering all migrants as workers which is not always the case (Arango, 2000).

2.4.2. Maslow’s hierarchy of needs

Maslow’s hierarchy of needs is based on understanding human needs. Maslow identified five layers of human requirements and essentials. According to this hierarchy an employer needs to satisfy the basic needs of his employees and then move to other unnecessary needs. The physiological needs are at the bottom of the hierarchy while the self-actualization has been placed at the top of the hierarchy (Maslow and Lewis, 1987).
According to this theory any need might act as a motivator. This theory is quite popular and has been widely cited in motivation aspects (Poston, 2009). However, this theory is critiqued for the reason that people generally deal with more than one set of needs all together; accordingly, the importance of necessities could move up and down the ladder (Geller, 1982). Maslow's model is considered quite simple and may fail to provide a solid and comprehensive framework that could capture all the factors related to workforce mobility. Despite the criticisms of this model it remains a compelling framing of human needs and therefore may be relevant as a behavioural approach to labour economics.

2.4.3. Herzberg's theory of motivation

This model is differentiating between two motivation factors which Herzberg called “satisfiers” and hygiene factors called “dissatisfiers”. Satisfiers which act as motivators include recognition and achievement while dissatisfiers are associated with poor working conditions. Dissatisfiers also include factors such as safety, wages, supervision, administrative aspects and interpersonal relations. Dissatisfiers always lead to job dissatisfaction, while the lack of satisfiers leads to absence of job satisfaction (Herzberg, 2005).

In other words, dissatisfaction might happen if hygiene factors do not exist. But they are not going to improve motivation levels of the workforce. On the other hand, the presence of motivation factor will lead to job satisfaction. However, the dissatisfiers
might have a minor impact on job satisfaction. A main criticism of this theory is that it fails to show similar findings in different situations (Bassett-Jones and Lloyd, 2005).

**Figure 2 Herzberg’s motivation factors**

Source: [http://research-methodology.net](http://research-methodology.net)

It could be argued that the hygiene factors of Herzberg are similar to the physiological safety and social need of Maslow; esteem and self-actualisations are similar to Herzberg’s motivation factors.

**2.4.4. Alderfer’s ERG Theory**

This theory developed by Clayton Alderfer is considered to be a simplification of Maslow’s model. According to this theory motivators are represented by three groups of core needs. The first group is called “Existence” and this represents the lowest level of human needs such as remaining alive and safe. This theory assumes that when human
beings satisfy their “existence” needs, they feel safe and physically comfortable. This group is similar to the bottom of Maslow’s pyramid of needs represented by physiological needs (Arnolds and Boshoff, 2002).

When people become safe they start looking for social relationships with people around them. Alderfer called this stage “Relatedness”. This stage is similar to social and esteems needs in Maslow’s pyramid of needs. The highest level of this model is “Growth”; at this stage when people successfully grow their common sense becomes more focused on achievement and success. This includes the top of Maslow’s hierarchy of need represented by Self-actualisation (Arnolds and Boshoff, 2002).

Both Maslow’s and Alderfer’s models are based on understanding the needs of people; the advantage of those theories is that they facilitate a better understanding of motivators based on need satisfaction. However, both Maslow’s and Alderfer’s models have been criticised as they are general theories of human development instead of an explanation of labour motivation (Landy, 1989).

**Figure 3 Comparison of theories of motivation**

<table>
<thead>
<tr>
<th>Herzberg</th>
<th>Maslow</th>
<th>Alderfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>Self-Actualisation</td>
<td>Growth</td>
</tr>
<tr>
<td>Esteem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td></td>
<td>Relatedness</td>
</tr>
<tr>
<td>Hygiene</td>
<td>Safety</td>
<td>Existence</td>
</tr>
<tr>
<td></td>
<td>Physiological</td>
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</tbody>
</table>

Source: [http://flvsmotivation.pbworks.com](http://flvsmotivation.pbworks.com)

**2.4.5. Health workers motivation and retention framework**

This framework was developed by Henderson and Tulloch (2008) (see figure (3)). This framework is trying to understand the health workforce mobility by identifying the factors that affect their motivation and retention. These factors are related to financial aspects, working conditions, living conditions, supervision and management, training and career aspects, bonding and mandatory service. The researcher believes that this framework is quite promising because it provides ground for better understanding of health workers and the factors that affect their decisions to stay or leave specific posts.
Better understanding of the health workforce could help the policy makers to adopt appropriate strategies that take into account what motivate them and what satisfy their needs. This framework has been adopted by the World Health Organisation to issue the policy recommendations related to attraction and retention of health workers to remote rural areas in 2010 (WHO, 2010).

**Figure 4 Henderson and Tulloch’s framework**

In this section the researcher has provided an overview of theories and models related to workforce motivation and retention. These models include labour economic theories, Maslow’s hierarchy of needs, Herzberg’s motivation theory, Alderfer’s model along with the Henderson and Tulloch framework. The latter is considered to be more suitable in providing better understanding of aspects associated with motivation and retention of
health workers. Accordingly, in the following section the researcher will try to examine the literature with respect to this framework in order to clarify the factors related to staffing remote rural areas with health workers.

2.5. Factors affecting rural health workers’ retention and strategies for responding to these factors

In the next section the researcher will shed light on the literature related to the factors and strategies of staffing remote rural areas. These factors and strategies have been identified through a literature review. This focuses on the main interventions that are expected to have a positive impact on staffing rural areas and improving health outcomes in rural and underserved areas. These interventions include training, financial incentives, compulsory service, task shifting, interventions related to working and living conditions and community-related interventions.

2.5.1. Financial aspects of healthcare worker staffing in remote rural areas

Financial reasons are cited most often as affecting health workers' decisions regarding working in remote rural areas (Martineau-t, 2003). Several studies (Vujicic et al., 2004) show that the main reason for the dissatisfaction and migration of health staff from low-income countries such as Cambodia and Vietnam to high-income countries is the difference in wages. Poor salaries may encourage skilled personnel to change from governmental sectors to non-governmental ones (O'Dempsey and Munslow, 2009). Financial reasons are always cited as the main reason for the migration of African doctors to America and Europe. Stable income has been identified amongst the main motivating factors that encourage rural health workers to stay in their posts (Lehmann et al., 2008; Martineau-t, 2003). High income countries always pay higher rates of compensation to the health workers than in the low income countries (Lehmann et al., 2008). A recent study conducted in Tanzania identified financial aspects as one of the main factors that affect the motivation of health workers (Zinnen et al., 2012).

Incentives always lead to improved staff motivation and hence better performance and patient satisfaction (Dieleman et al., 2009). Strategies adopted to respond to financial problems include increasing salaries and allowances (WHO, 2010). These allowances are sometimes allocated according to the remoteness of the rural area in question. In
some countries, they are called hardship allowances (Wibulpolprasert and Pengpaibon, 2003). Financial incentives have been implemented in many African countries including Rwanda and Zambia in order to reduce attrition rates of health workers in underserved areas (Gow et al., 2013; Serneels et al., 2010). Sometimes financial incentives may be combined with other interventions such as compulsory services as in Indonesia, Thailand and South Africa (Lehmann et al., 2008). Financial incentives are not only necessary to meet the health workers’ needs but also to fulfil their families’ needs (Adzei and Atinga, 2012).

The literature reflects many initiatives which were adopted to encourage health workers to work in remote rural areas. These interventions include paying incentives which have different names such as rural allowances and retention incentives (Henderson and Tulloch, 2008). In Thailand, the incentives were designed with respect to remoteness of the areas. For instance, a doctor working in rural districts will receive less rural allowance than a doctor working in a remote rural district. Those doctors who work in the most remote districts will be paid the higher rates of the rural allowances (Henderson and Tulloch, 2008). Performance based incentives have been implemented in rural Malawi to encourage health workers to provide health services for the rural communities. This initiative has resulted in improving access to health care for people with TB and HIV (O'Dempsey and Munslow, 2009).

Financial interventions should be designed to retain the health workers inside the country and to facilitate equal distribution of health workers inside the countries (Snow et al., 2011). Increasing public salaries could improve retention rates in the country; however, if the government wants to improve retention in underserved areas, then a special incentive package for rural retention needs to be considered. For example, in Ghana increasing doctors’ salaries has resulted in reduction of migration without impacting on balanced distribution between different districts (Snow et al., 2011).

According to Henderson and Tulloch (2008), the efficacy of financial incentives is always dependent on the income that could be earned from private practice in urban areas; thus, all financial interventions should be monitored and evaluated over time and adapted as necessary. According to Serneels et al. (2010), financial incentives on their own are not enough to attract motivated health workers to work in underserved areas. There are other factors that could affect the performance and productivity of health
workers. These factors include availability of better living and working conditions along with career advancement opportunities. In a study conducted by Mensah (2002), the participants who were compulsory service doctors have mentioned doubling of salaries as one of the main reasons behind their decisions to remain in remote areas.

Raising salaries is not an easy task, particularly in low income countries where the governmental budgets are always limited. It is not easy to allocate a specific package of financial incentives for the public health workers exclusively. Such a measure could be considered as unfair by other public sector servants and their professional associations (WHO, 2006). However, it could be easy for governments to impose top up incentives rather than increasing salaries, in that salaries are always dependent on strict administrative rules in line with the countries’ civil service guidelines.

According to Henderson and Tulloch (2008), limited public resources make it very difficult for low income countries to compete with the salaries of high income countries. For example, salaries of the specialist doctors in Australia are more than ten times their Sri Lankan counterparts. Bilateral agreements between source and recipient countries have been recommended in order to reach win-win solutions through memorandums of understanding. However, the recipient countries have no interest in signing these kinds of agreements; instead they are always looking for ways to solve their own problems regardless of the consequences for the source countries.

As a result of very low government salaries, health workers may take a second job in order to earn more; some work in both the public and private sectors known as dual practice. This includes legal or illegal actions; legal actions for example, may be a private clinic or any other job. Overprescribing of medicines and unnecessary laboratory investigations have been reported in China as coping strategies. Other coping tactics include stealing medicines and supplies, absenteeism and imposing informal user fees (Henderson and Tulloch, 2008). It also includes overprescribing drugs and diagnostic tests in their private clinics in order to maximize their earnings (Dolea et al., 2010). Others simply migrate internally or externally, or leave the health sector altogether. Dual practice may be condoned or overlooked in many countries. However, if it spreads among health professionals it could lead to a decrease in the quality of healthcare provided to rural communities (Humphreys et al., 2009).

Examples of dual practice were found in many countries including Cambodia and Vietnam. In Vietnam, doctors tend to open private clinics closer to their public health
facilities (Martineau-t, 2003). More than one third of Vietnamese doctors were found to have a second job in addition to their public health sector one (Vujicic et al., 2011). In Tanzania, health workers may cope with a shortage of income by growing and selling vegetables and fruits or/and doing second jobs away from the health sector (Stringhini et al., 2009). Health workers always tend to respond to the problem of low salaries by involving themselves in private activities in order to earn more money. According to Fresta et al. (2000), doctors may earn more than double their monthly salaries from the public sector by working for a few days in private clinics. In addition to low public salaries, poor supervision has been identified as one of the reasons behind dual practice in low income countries. Also, amongst the concerns around dual practice is that health workers may refer patients to their own private clinics (Henderson and Tulloch, 2008).

Even though dual practice might have a negative impact, allowing this practice was suggested by other authors as it might encourage health workers to stay longer in the public health sector facilities. Accordingly, dual practice has been permitted in many countries including Indonesia and Vietnam (Henderson and Tulloch, 2008). However, monitoring tools need to be considered to ensure that health professionals are not neglecting public health facilities for the interest of their private ones (WHO, 2006). Sufficient financial resources should be allocated to the health sector to facilitate payment of salaries to different health workers. Respectable share for these financial resources should be allocated for creating an enabling environment for health workers with provision of equipment and supplies particularly in remote areas. Political commitment should be translated into more financial allocation for the health sector to enable effective delivery of healthcare for the population.

2.5.2. Compulsory services

Regulatory interventions such as compulsory service, a conditional licence that can only be fulfilled by working in rural areas, or the rotation of medical doctors between areas has been a clear success in staffing remote rural areas with health workers (Frehywot et al., 2010). Compulsory service in rural areas has been implemented in many countries, including South Africa, Zambia, Mexico, Ecuador and Indonesia (Dieleman et al., 2011). Compulsory service increases the presence of doctors in rural areas which in turn improves the accessibility of health services in such areas (Dieleman et al., 2011).
Compulsory service has been considered as an effective means of retaining medical staff in the targeted areas for a specific period of time (Henderson and Tulloch, 2008). According to a survey conducted by Mensah (2002), compliance with compulsory service rules has been mentioned as one of the main reasons underpinning doctors’ decisions to come and stay in remote underserved posts. This strategy has shown a clear success rate in staffing remote rural areas with health workers (Lehmann et al., 2008). In Thailand, doctors have to work at least one year in a remote rural area before being permitted to undertake specialised training programmes (Wibulpolprasert and Pengpaibon, 2003). The implementation of compulsory services in rural areas has strongly encouraged Thailand’s dentists to work in rural areas (Lexomboon, 2003).

Other related interventions, such as a conditional licence that can only be fulfilled by working in a rural area, or the rotation of medical doctors between areas, have also been tried in some countries. In Thailand, for example, tuition fees and other subsidies were provided to students recruited by the Ministry of Health in exchange for working in remote rural areas after graduation (Wibulpolprasert and Pengpaibon, 2003). In Indonesia, compulsory service was combined with higher salaries along with free specialised training opportunities upon completion of a compulsory service period in specific very remote rural areas (Dussault and Franceschini, 2006). This measure is in line with the WHO recommendations about combining compulsory service with incentive packages to facilitate attraction and retention of health workers to remote rural areas (Dieleman et al., 2011).

However, there is debate regarding the efficiency of such coercive measures and mandatory policies because they require administrative capacity and political will for their enforcement. This could make them unworkable in the context of low-income countries (Huicho et al., 2010). Also these coercive measures could be considered as unfair as other professionals may not ask to carry out compulsory service (Wilson et al., 2009). In order to have successful deployment through compulsory services, detailed monitoring and effective management should be maintained to make sure that health workers are complying with the policy. These measures are expected to sustain the availability of health professionals in the rural areas because penalties might be applicable when necessary (Henderson and Tulloch, 2008).
2.5.3. Working and living conditions

Good working and living conditions have been cited in the literature as having a direct effect on a health worker's satisfaction (Henderson and Tulloch, 2008; Lehmann et al., 2008). According to Martineau (2003), the main reason for the migration of doctors and nurses is poor working and living conditions. Poor working conditions may encourage skilled personnel to change from governmental sectors to non-governmental ones (O'Dempsey and Munslow, 2009). Inadequate infrastructure has been classified as a de-motivator in a study carried out in Nigeria (Ebuehi et al., 2011). According to Bourgain and Zou (2009), the migration of health workers could happen as a result of the differences in working and living conditions between the recipient and source countries. Health workers may also look for securing better educational opportunities for their children, which may not be available in their home countries. Many studies have identified working conditions amongst the main factors that affect health workers’ decisions to stay or leave rural areas. This includes availability of equipment and supplies and management support (Dieleman and Harnmeijer, 2006; Henderson and Tulloch, 2008; Lehmann et al., 2008).

According to Fauveau et al. (2008), the health workers will become unable to perform their tasks perfectly if they are concerned about their own safety or their families’ safety. A recent study conducted in Tanzania identified working and living conditions amongst the main factors that affect motivation of health workers (Zinnen et al., 2012). In Nigeria, health workers are reluctant to serve in areas that lack amenities and welfare facilities for health workers and their children (Ebuehi et al., 2011).

Globally, the majority of health workers are women; this indicates that safety and security measures need to be considered always to sustain an enabling environment. Even some authors assume that male doctors are more likely to practice in rural areas than female doctors. Others believe that this might change if suitable accomodation was built for female doctors (Wilson et al., 2009). Health workers can’t do their job perfectly in health facilities that lack basic services such as electricity, clean water and other requirements such as equipment and supplies (WHO, 2006). Factors such as housing, paved roads and transportation facilities, clean water, electricity, medical equipment, medicine, telephone and internet services have all been mentioned as factors affecting a health worker’s decision to stay in a rural area (WHO, 2010). In Nigeria,
health workers are reluctant to serve in areas with poor telephone and mobile networks (Ebuehi et al., 2011).

Lack of housing is one of the main factors cited in the literature as having an influence on the decisions of health workers to join or to leave a specific post. The availability of appropriate healthcare services is also important for attraction and retention of health workers. Availability of schools is very important for those who have children. Good working conditions always enable health workers to perform their tasks (Henderson and Tulloch, 2008). This indicates that better health outcomes could be affected by availability or lack of suitable working conditions. One study has shown that appreciation from managers, colleagues and the local community also motivate health workers to stay in rural areas (Berman and Cuizon, 2004). Another showed that community support and respect can encourage them to stay longer in rural posts (Wafula et al., 2011). However, violence and physical assault, particularly against women, has been mentioned as a negative factor, based on research in Tonga (WHO, 2004a).

A study conducted in Africa has shown that conflict is one of the main reasons for migration of doctors in many African countries (Awases et al., 2004). Developed and high income countries are enjoying a safer living environment and provide more satisfying working conditions for manpower than in low income countries (Lehmann et al., 2008). According to Mensah (2002), staff accommodation, good transport, electricity, along with availability of clean water has been identified amongst the main factors relevant to creating conducive living environments. However, availability of suitable accommodation was given more points by the surveyed doctors. Interventions related to improved working and living conditions in rural areas mainly aim to improve retention by reducing turnover rates and addressing high attrition problems of the existing staff (Gow et al., 2013). Long working hours and overloaded amount of work in the source countries have been identified among the main reasons for doctors’ migration to the developed countries (Henderson and Tulloch, 2008). Excessive working hours was also identified as one of the reasons behind leaving specific posts (Kim, 2000).

According to the WHO (2006), there is an association between high rates of absenteeism in health facilities and lack of paved roads. In some countries, violence
against female health workers in remote rural areas is one of the main challenges facing successful staffing of the health facilities (Henderson and Tulloch, 2008). According to the WHO (2006), there is an association between violence in the place of work and staff turnover. Safety in the workplace and living areas is really important and could contribute to health worker satisfaction. According to Henderson and Tulloch (2008), violence in the workplace could be reduced if health workers work in teams. Thus health workers should encouraged to work in teams and groups particularly on night shifts in remote health facilities and in emergency units.

According to Lehmann et al. (2008), factors such as local labour relations, leadership and management styles could have a real impact on health workers staying longer in a specific post. According to the WHO (2006), supportive supervision is important for the performance of any health system because it encompasses recognition of successes and achievements, practical feedback along with technical support. These measures are expected to have a positive impact on the quality of the provided healthcare. Strategies aiming at increasing recognition and social acceptance have been associated with motivation and satisfaction in health workers. According to Martineau-t (2003), appreciation from managers and colleagues has been identified as one of the main motivators of health workers in Vietnam.

Lehmann et al. (2008), state that higher quality of life has been mentioned as one of the factors motivating health workers to move from low income countries to high income ones. Better educational opportunities for children have been identified amongst the main reasons that influence the decisions of health workers to migrate outside the country. There are many studies which confirm a correlation between better living conditions and the health workers’ willingness to stay longer in specific posts (WHO, 2010).

According to Henderson and Tulloch (2008), lack of supportive supervision has been identified as one of the main reasons behind dissatisfaction of health workers in many countries including Cambodia and Tonga. This is the case when supervisory activities aim to provide technical support to the manpower. However, sometimes supervision visits are aimed at staff appraisals rather than improving the performance of health workers (Martineau-t, 2003). Supportive supervision has been found to be effective in improving satisfaction, performance and the quality of care in rural areas in various
countries, including the Philippines and Papua New Guinea (Marquez et al., 2002). Many studies have shown that supportive supervision could improve the satisfaction of health workers. This satisfaction may positively influence their decision to stay longer in remote rural areas. Other studies have shown a correlation between existence of supportive supervision and quality of provided health services (Lehmann et al., 2008; Bradley et al., 2013). Supportive supervision is perceived to be effective in ensuring quality of healthcare and supporting health workers (Bradley et al., 2013; Bosh-Capblanch et al., 2011). Supervision is vital to monitor, evaluate and reform the performance of health workers particularly mid-level cadres. Some low income countries suffer from unclear performance indicators (Bradley et al., 2013).

In a study conducted in Tanzania, decentralisation was perceived as having a positive impact on recruitment and retention of mid and lower-level health workers. However, the respondents perceive the decentralised arrangement as having a negative impact on recruitment and keeping a balanced distribution of highly skilled personnel (Munga et al., 2009). Thus a combination of centralised and decentralised measures should be considered to achieve a balanced distribution of a high and low level health workforce (Munga et al., 2009). According to Dieleman et al. (2009), the decentralization of human resource management functions including planning, monitoring and evaluating of health facilities' performance could have a positive impact on improving practices related to supportive supervision and therefore support to workers. Continual supportive supervision visits to rural health facilities coupled with a continuous in-service training programme could help in sustaining health services with acceptable standards of quality.

According to Cavender and Albán (1998), who conducted research amongst doctors deployed through compulsory service mechanisms, being able to identify housing and availability of healthcare services was one of the main factors affecting their decision to stay or leave a specific post. A stable job has been identified amongst the main motivating factors that encourage rural health workers to stay in their posts (Martineau-t, 2003). Thailand is an example of a middle-income country which invests in improving general living conditions in its different regions. This includes a variety of interventions related to housing, water supply, paved roads and telephone services. These kinds of efforts are targeting the entire rural communities and the health sector definitely benefits from this kind of intervention. Interventions related to improving working conditions were also found in Zambia with retention programmes that include
refurbishment of doctors’ houses to encourage them to come and stay in rural areas (Lehmann et al., 2008).

2.5.4. Task shifting

Task shifting could be defined as optimising the roles of midlevel cadre by enabling them to provide health services beyond their normal scope of practice (WHO, 2012). The aim of this initiative is to address the challenge of understaffing of rural health facilities by optimising the roles of the available human resources (Fulton et al., 2011). Other outcomes of task shifting include reducing health inequalities between urban and rural areas by improving access to healthcare for the rural communities. One of the main advantages of task shifting is that it enables a variety of health services to be effectively delivered by lower health workers at lower cost. Health workers with enhanced scope of practice are more likely to provide cheaper healthcare services for the rural populations. The health workers to whom tasks are being shifted always have lower certificates and their pre-service training is generally shorter than those who cede tasks (Bradley and McAuliffe, 2009).

Task shifting was considered one of the main interventions related to overcoming the shortage of health workers and was expected to enable access to healthcare services in remote and rural areas (Nabudere et al., 2011). Medical officers were trained to perform surgical operations and this experience shows outcomes similar to the outcomes when the same operations are performed by doctors (Fulton et al., 2011). Shifting some of the tasks usually carried out by doctors onto nurses or medical assistants could have a positive impact in the staffing of remote rural areas (Fulton et al., 2011). Sometimes the term “role enhancement” is used when tasks are shifted to a group of health workers after being trained in a manner that enables them to take higher tasks in addition to their traditional roles. In this case the designed training programme should enable them to obtain new capabilities which are not available for old-style trainees (Dubois and Singh, 2009). Examples of role enhancement include General Practitioner (GP) turning into GP with special interest (Kislov, 2012).

Enhancing the role of practice is used particularly in shifting some tasks of specialists to the nurse practitioners. These practices have been reported in many developed countries including the UK and US. Fortunately, there are no concerns related to quality of the
provided services by the lower cadres in these countries. Some studies have reported more patient satisfaction when the services are provided by nurse practitioners particularly regarding interpersonal skills (Horrocks et al., 2002). Nurses were also carrying out tasks related to general checks and helping patients with specific conditions. These practices have been reported in the UK since 1990 suggesting an optimistic future for this initiative (Dubois and Singh, 2009). In the UK and the US the roles of GPs may be expanded to focus on particular issues, known as “GPs with special interest”. Also the roles of some pharmacists have been expanded to contain health education activities for the targeted patients.

The term “task sharing” may be used to describe actions related to the delegation of some tasks to a group of health workers who may perform these tasks for the first time (Dawson et al., 2013). Task shifting activities tend to be assessed from time to time in order to see whether the provided services have the same quality as those provided by the original staff. In addition to that, other assessments may evaluate whether shifting tasks to lower cadre could have a positive impact on their motivation and satisfaction. These health workers may feel satisfied and motivated when provided with more responsibility and control (Dubois and Singh, 2009). Other studies (Collins et al., 2000), have also reflected that health workers with enhanced scope of practice have shown high retention rates.

In the UK there are a lot of examples of delegating tasks of GPs to nurses (Kislov, 2012). However, there are some concerns in delegating tasks, because it may affect the sense of association between patients and their GPs (Dubois and Singh, 2009). The main concern around role enhancement includes the potential conflict between the involved professions (Wilson et al., 2002). Other concerns include the fact that the higher level health workers may be reluctant to train or to cede tasks to lower level ones (Fulton et al., 2011).

According to Dubois and Singh (2009), there are many measures that need to be considered when implementing task shifting strategies. These measures include legislation and principles, and educational and training programmes relevant to the targeted health workers to facilitate the implementation of the policy. Task shifting needs to be agreed, discussed and shared amongst policy makers and relevant stakeholders. These stakeholders might include managers from different healthcare organisations, researchers related to the health sector, HRH specialists, and health
workers’ professional associations. This could predict all the expected weaknesses of the planned initiative and suggest appropriate recommendations. Regulatory frameworks with enabling environments, including equipment and supplies, are crucial to facilitate a successful task shifting initiative. In order to have a successful task shifting initiative, policy makers should consider the application of relevant measures to sustain healthcare services with better quality (WHO, 2012).

2.5.5. Training

According to the WHO (2006), skilled human resources are essential for providing health services that diagnose, treat and prevent illness and promote population health, and the key to effective and efficient health services. Training programmes should always focus on addressing public health issues. Health systems need to make sure that sufficient numbers of health workers ready to implement strategies related to health care delivery are available in all regions with an appropriate skill mix. Brain drain is a real challenge facing developing countries. Thus, producing and training health workers along with capacity building could be a good response to the brain drain problems (O'Dempsey and Munslow, 2009). According to Huddart et al. (2013), low income countries should consider training of multipurpose health workers to deliver a variety of healthcare services especially in remote and rural areas. Professional training and career advancement are also cited among the main factors that encourage health workers to leave rural areas (Lehmann et al., 2008). A study conducted in Cambodia identified the availability of training and career progression opportunities in the public sector as one of the main factors encouraging health workers to stay in the public sector (Henderson and Tulloch, 2008). Lack of opportunities for professional development may encourage skilled personnel to change from governmental sectors to non-governmental ones (O'Dempsey and Munslow, 2009). Guaranteed professional training and continuous education coupled with technical support for rural practitioners could encourage health workers to stay in rural areas. Many countries have found guaranteed professional training and continuous education for rural practitioners to be successful in encouraging them to stay (WHO, 2009). A study conducted in Australia has shown that providing career advancement opportunities for rural midwives increases retention rates (Fahey and Monaghan, 2005). In rural Nigeria, health workers feel dissatisfied as a result of absence of career progression opportunities (Ebuehi et al., 2011).
Being isolated in a remote rural area makes it difficult to benefit from training opportunities and also makes academic and practical conversations with colleagues more infrequent. Organized replacements have been suggested to avoid long professional isolation for rural health workers (Lehmann et al., 2008). Many countries have found secure professional training and continuous education for rural practitioners to be successful in encouraging them to stay (WHO, 2009). However, limited resources particularly in low income countries can hinder the provision of training opportunities for health professionals.

Training has been identified amongst the main motivating factors that encourage rural health workers to stay in their posts (Martineau-t, 2003). A study conducted in Africa has shown that one of the main reasons for the migration of doctors to developed countries is to complete their career by being specialised doctors (Awases et al., 2004). This indicates that completing professional training is one of the main targets for doctors. Developed and high income countries provide better career improvement chances than the low income countries (Lehmann et al., 2008). Career development has been identified amongst the main priorities for interviewed doctors in Ghana (Snow et al., 2011). This also is the case in many African countries including Kenya and Benin (Mathauer and Imhoff, 2006). The absence of specialized training opportunities has been mentioned as one of the reasons behind job dissatisfaction in many studies (WHO, 2004a). However, provision of specialised training opportunities is always difficult for poor health systems such as in low income countries (Henderson and Tulloch, 2008).

Expanding production and training of midlevel health workers was suggested by Huddart et al. (2013) to respond to the problems of losing so many high health professionals particularly doctors who move to the developed and high income countries. Thus the health systems need to produce midlevel cadre who are unlikely to migrate, and more likely to be retained in the underserved areas. Every country should train and produce mid-level health workers with respect to its need. In recent years many African countries have started to invest in producing mid-level cadres in order to minimise the bad consequences of the brain drain of highly skilled health professionals such as doctors and specialists (Bradley and McAuliffe, 2009). Other initiatives could be relevant to address the shortage of staff including training and recruitment for the purpose of rural practice (Lehmann et al., 2008). One implemented in Thailand is based on the training of midwives and nurses in their local areas. Those health workers have
been licenced and allocated to posts in their home villages or towns upon completion of the training programmes (Wibulpolprasert and Pengpaibon, 2003).

A similar method based on recruiting and training of community based health workers was also found in many African countries including Ghana and Kenya. Those health workers have to serve their local communities (Lehmann et al., 2008). In Thailand a variety of strategies which respect the importance of the rural background have been used; these strategies include, focusing on candidates from rural backgrounds, training of health workers in rural health facilities and posting them where they come from (Henderson and Tulloch, 2008). Improving the productivity of the available health workers through in-service training, targeting improving their skills, is recommended to improve the quality of the provided service at remote underserved areas. These career related interventions are expected to have a real impact on increasing satisfaction and facilitating retention of health workers at their work place (Lori et al., 2012).

2.5.6. Personal and family factors

Whether or not a health worker accepts a rural post has been found to be affected by their personal characteristics such as gender and age. Marital status could also affect a person’s choice to accept a post or to stay in a specific area. Personal factors also include altruism and personal values and beliefs, and sometimes personal motivators do not necessarily come from outside but could come from inside (Lehmann et al., 2008). 47% of midwifery trainees in one of the midwifery schools in Ghana mentioned serving humanity as one of the main motivators behind their intention to serve rural communities (Lori et al., 2012). Many studies have found that men are more likely to stay in rural areas than women (Dolea et al., 2009). However, Wilson et al. (2009) ascribe this to female medical doctors indicating that lower cadre females may accept working in rural areas. In many countries, women represent a large proportion of the health workforce, thus it is important to consider their needs when deploying them into remote rural areas (Brachet and Shaw, 2009). This could include flexible working hours, access to child care and schools (Iipinge et al., 2009).

Family factors were cited among the aspects that could influence the decisions of health workers to stay in or leave a specific post (Lori et al., 2012). Women often have to be accompanied by their husbands or parents because of security concerns. Their marital
status will also clearly have an effect (Lori et al., 2012; Jegede et al., 2012). A study conducted in Bangladesh suggests that female doctors always follow their husbands (Dussault and Franceschini, 2006). Age is also found to be one of the main factors; some studies have shown that it is only younger health workers who tend to stay in remote rural posts (Snow et al., 2011). Other studies have found that family-related factors influence the attraction and retention of health workers in remote rural areas (Lori et al., 2012). For example, Henderson and Tulloch (2008), found that, in some Pacific countries, doctors often decide to move to urban areas or abroad to be near to their relatives.

Studies from Malaysia show that partners have an influence on each other’s decisions (Abdul Rahim and Mwanri, 2012). Other studies have shown that single persons have higher turnover than married ones. The difference between single and married health workers is that the singles can take their decisions according to their personal interest, while the married health workers have to consider the needs of their partners and children. This argument is supported by a study of oral health professionals which was conducted in remote Western Australia. This study has found that the most common reason for leaving rural practice was the lack of access to educational facilities for these health workers’ children (Kruger and Tennant, 2005).

The movement of men is mainly due to economic considerations while the mobility of women is mainly due to family considerations (Lehmann et al., 2008). Rural origin which is defined as completing primary or secondary school at a rural area has been considered as having an effect on health workers’ decision to work in rural areas (Wilson et al., 2009). WHO recommended consideration of rural origin in selecting medical trainees from underserved areas; believing that they are more likely to return to their original areas after completing their training programmes. There is evidence from some developed countries particularly the US and Canada suggesting that, the students from rural backgrounds are more likely to work in rural posts than others (Henderson and Tulloch, 2008). There is evidence from different studies that the students from rural backgrounds are more likely to serve rural populations than their urban counterparts (Lori et al., 2012). Also medical students who graduated from medical schools located in rural areas are more likely to work in rural locations (Wilson et al., 2009).

Braichet and Shaw (2009) state that rural origin and altruism also have a positive impact on whether a health worker chooses to stay in a rural post. Some studies have found that
students from rural backgrounds have a higher tendency to work in rural areas than those from urban origins, while others have shown that personal values - including altruism - encourage health workers to go to rural areas (WHO, 2009). Altruistic motivations might make health workers feel satisfied when serving others. Some authors suggest that governments should seek to recruit people with altruistic motivations who are more likely to serve the needy and the vulnerable. Moreover, altruistic individuals are expected to stay longer in health professions (Smith et al., 2013).

Motivators are thus not necessarily something imposed from outside but may originate from a person’s values and beliefs. This argument is strengthened by the finding that people tend to spend their money and time on charitable programmes because they are convinced of their necessity and humanitarian feasibility. Research conducted in Ethiopia and Rwanda has identified that helping the poor is one of the motivation factors that encourage health workers to serve the rural communities (Serneels et al., 2010). Interviewed health workers in Malawi mentioned that assisting mankind is one of the motivation factors to stay in the profession (Manafa et al., 2009). However, it is difficult to develop strategies in response to some individual factors such as selfishness. The degree of altruism of any person is dependent on that person’s values and beliefs. Also intrinsic values are different from one community to another and it is difficult to identify these features in people. Thus health policy makers tend to focus on extrinsic factors rather than intrinsic factors in designing motivation and retention strategies related to tackling health workforce imbalance (Adzei and Atinga, 2012).

2.5.7. Public Participation

Mali has an example of utilising the community to recruit health workers. This experience is based on recruiting different types of health workers by local communities as the public health system is unable to recruit them. As a result of these efforts, one third of the primary healthcare providers including doctors, nurses and midwives were recruited by local communities’ associations (Van Dormael et al., 2008). These community based interventions have convinced many health workers to serve in poor areas. Nonetheless, additional services including housing and transportation were also provided. This experience was assessed by the WHO in 2005 and has been considered a successful model in terms of increasing the availability of health workers in remote
rural areas. As a result, accessibility indicators including utilization rates were increased during the period preceding the assessment (Van Dormael et al., 2008).

One study has shown that appreciation from the local community also motivates health workers to stay in rural areas (Berman and Cuizon, 2004). Another has shown that community support and respect can encourage them to stay longer in rural posts (Wafula et al., 2011). However, violence and physical assault, particularly against women, have been mentioned as negative factors (WHO, 2004a). Community responses such as respecting health workers can only be encouraged by health education programmes.

2.5.8. Discussion

The presented literature shows that the attraction and retention of health workers in remote and rural areas is subject to two interrelated aspects: the factors that determine whether or not health workers will stay in rural health facilities, and the policies and strategies adopted by policy makers in response to these factors (Lehmann et al., 2008). This body of literature describes many factors that explain why health workers decide to stay in or leave rural and remote areas (Henderson and Tulloch, 2008; Jegede et al., 2012; Lori et al., 2012). These include personal and family factors, working and living conditions, career-related factors, financial aspects and mandatory rural service (Lehmann et al., 2008; Huicho et al., 2010; Braichet and Shaw, 2009; WHO, 2010; Henderson and Tulloch, 2008).

The researcher makes some modifications to Henderson and Tulloch’s framework by adding relevant interventions to each of these factors after utilising the work of Lehmann et al. (2008) and the WHO (2010). The developed framework is expected to provide a solid and comprehensive base for the attraction and retention literature and expected to facilitate proper presentation of the findings (see figure (4)).
Factors affecting Health workers’ retention in rural areas

- Personal and family factors
  - Gender, age, and family considerations
  - Educational interventions
- Career related factors
  - Supervision, improve safety, job description, equipment and medicines
  - Training opportunities & continuous education
- Working and living conditions
  - Better living conditions
  - Safe and supportive working environment
- Financial factors
  - Rural allowances, increased salaries, pensions plans, health/life insurance
- Mandatory service
- Regulatory interventions

Source: Adapted from (Lehmann et al., 2008; Henderson and Tulloch, 2008; WHO, 2010)
According to Lehmann et al. (2008), one intervention would not be capable of solving understaffing or the retention problem; a bundle of interventions are likely to make a difference. According to Willis-Shattuck et al. (2008), financial incentives should be combined with better working conditions to facilitate motivation of health workers. It is not only about deployment and retention; there should be interventions to improve productivity and performance of existing staff who already work in underserved areas (WHO, 2006). However, many of these interventions lied beyond the scope of the ministries of health suggesting strong recommendation for coordination amongst all authorities related to public health. NGOs could also play a significant role in this process; thus, the suggested partnership should be within and without governmental organisations. Ministries responsible for transport, housing and security should be involved in designing strategies related to improving working and living conditions. While strategies related to financial interventions should be discussed with the ministries of finance.

Indonesia has adopted an intervention which is based on combining compulsory service with financial incentives. Accordingly, the doctors who choose to spend the compulsory service period in rural areas will receive salaries double that of their urban counterparts. Those doctors also have opportunities to be recruited in the civil service after completing the compulsory service period. This will give them the opportunity to utilise specialized medical training which could be provided for doctors who become part of the civil service (Chomitz, 1998; Lehmann et al., 2008). In Thailand the ministry of health has secured a package of incentives for doctors who spend the compulsory service period in remote rural areas. These services include tuition fees for further studies, learning materials and clothes (Wibulpolprasert and Pengpaibon, 2003). Combined strategies were also adopted in Zambia in 2003 in terms of an incentive package which includes a rural allowance, rehabilitation of accommodation or housing loans, and transportation vehicles along with career advancement opportunities in exchange for working in rural areas. The overall objective of the scheme is to improve attraction and retention of health workers to rural areas.

A recent assessment was conducted in 2013 to evaluate the effectiveness of the Zambian retention scheme. It concluded that the scheme has been unsuccessful in attracting the targeted numbers of health workers. However, it succeeded in
encouraging a respectable number of health workers to go and serve at the rural health facilities (Gow et al., 2013). According to Gerein et al. (2006), high rates of turnover might lead to harming the memory of the health facilities. This could lead later to repetition of tasks that may already have been done before and consequently a waste of time and resources.

The researcher has written about the factors and strategies related to staffing remote rural areas with health workers. These strategies are related to training, role enhancement, financial aspects, working and living conditions and community related interventions. However, the presented literature is not linked to a specific health issue. The researcher has chosen to focus on maternal health workers. Reducing maternal mortality by 75% by the year 2015 is one of the main targets of MDGs. Given that most of the interventions identified in the attraction and retention framework are not a specified category of health workers, accordingly, it will be appropriate to review literature related to human resources interventions for maternal health in general and to reduce maternal mortality in particular. Hence in the next section the researcher is going to consult human resources interventions related to reduction of maternal mortality in middle and low income countries.

2.6. Human resources strategies related to reduction of MMR in low income countries

Improving maternal health services including reducing high MMR is one of the main challenges facing low income countries (Bhutta et al., 2010). More than a million women die every year as a result of complications related to pregnancy and childbirth (Fauveau et al., 2008). Low income countries are committed to meeting the Millennium Development Goals (MDGs) agreed in 2000. Millennium development goals including reducing MMR by 75% is one of the main challenging targets for low income countries. In this section the researcher is going to outline human resources strategies related to staffing remote rural areas with maternal health workers for a deeper understanding of the strategies relating to the reduction of maternal mortality. The aim of this part is to examine the literature and to identify hypotheses related to human resources management interventions related to reducing maternal mortality.
2.6.1. Background

Interventions related to human resources for health have shown a direct impact in reducing maternal mortality in many countries (Bhutta et al., 2010). There are many interventions that could reduce maternal mortality. However, this research will focus on interventions related to human resources management. Skilled human resources are considered to be essential for better maternal health outcomes. The availability of skilled birth attendants (SBAs) for normal delivery and emergency obstetric care (EmOC) in case of complications is considered a primary intervention related to reduction of MMR (Prata et al., 2009). The main causes of maternal mortality include postpartum haemorrhage, obstructed labour, eclampsia, sepsis and unsafe abortion (Prata et al., 2009) and the shortage of human resources for health is one of the main reasons behind high mortality rates in low income countries (Fauveau et al., 2008).

Forty one African countries have already developed roads maps to reduce maternal mortality; these roads maps mainly target increasing the production of community midwives, improving their skills and their competences. However, securing sufficient financial resources for effective implementation of these road maps is always a problem for these countries (Fauveau et al., 2008). An estimate for the shortage of midwives is 334 000 in low income countries; the World Health Organisation has declared that more than 40% of deliveries in low income countries were not assisted by skilled birth attendants (WHO, 2005). This is a real challenge for low income countries to fill this gap in the presence of financial resources necessary to train, recruit, deploy and retain the required numbers of midwives in a short period of time. It is a human right to provide safe delivery for women. The WHO standard assumes that a midwife can serve 200 pregnant women every year (Fauveau et al., 2008).

There are many categories of midwives in low income countries. One category is Nurse Midwives who are originally nurses that undertake a one year midwifery training course. Another category is Village Midwife (VMW) who receives one year training in midwifery services. In some African countries there is a midwifery technician who receives two years training. Health Visitors are originally nurse midwives who receive one year training to qualify for this profession.
Countries with high rates of MMR are usually characterised by weak health systems, misdistribution of health professionals and severe shortage of Skilled Birth Attendants (SBAs) (Fauveau et al., 2008). In low income countries most maternal deaths occur in remote rural areas, thus most human resources management interventions tend to focus on producing, training and retaining midwives. The main reason behind this trend is that the production of midwives is cost-effective. Also this cadre are more likely to stay in remote rural areas than doctors (Fauveau et al., 2008). To reduce maternal deaths, policy makers need to adopt strategies that facilitate the provision of the midwifery cadre where women are giving birth, particularly in remote rural areas (Fauveau et al., 2008).

Clinical interventions related to reduction of MMR are considered to be simple and cost-effective. However, these clinical interventions need to be provided by a trained birth attendant. Birth attendants might be doctors, nurses, midwives, or could be TBAs (Fujita N, 2013). Those birth attendants should be backed by emergency services to enable them to deal with emergencies in the presence of a functioning health system (Fauveau et al., 2008).

Producing and training home birth attendants (HBAs) is an intervention in low income countries. These countries suffer from large rural populations. Nearly half the world’s women deliver their babies at home (Garces et al., 2012). This indicates that provision of home birth attendants is a crucial intervention to ensure safe motherhood particularly in low income countries where the majority of deliveries take place at home. Midwives are considered to be the most cost-effective health workers who can provide these services at homes. Midwives always deal with normal cases while doctors and obstetricians are trained to deal with severe and complicated cases including performing caesarean section (Fauveau et al., 2008). Health workers with midwifery skills can play a major role in overcoming two of the three delays related to maternal death particularly in remote rural areas (Bhutta et al., 2010). In the next section the researcher will try to shed light on training as an intervention to address maternal mortality in low income countries.
2.6.2. Training programmes related to midwifery services

Many countries invest in midwifery training programmes as a main intervention to tackle maternal mortality (Lori et al., 2012). Investing in midwifery is considered the main reason for reduction of maternal mortality in many countries (Fauveau et al., 2008). When MMR increased in Zimbabwe in the late 1990s, the government successfully managed the problem by increasing the numbers of midwives after revising the curriculum and creating an enabling environment that included a better working environment. Pakistan started its plans to train about 60000 midwives in 2007. A similar programme was implemented in neighbouring Afghanistan which also succeeded in graduating more than 1300 community based midwives to serve rural communities (Fauveau et al., 2008). Producing large numbers of midwives is the main intervention to reduce MMR.

Cambodia has adopted strategies related to production and deployment of midwives as part of a reproductive health strategy aimed at reducing MMR (Fujita N, 2013). The shortage of midwives is a real challenge hindering improvement in maternal health services particularly for rural populations (Fujita N, 2013). In Cambodia, a one year midwifery training programme was introduced in 1980 as a main intervention to improve the numbers of trained midwives in the country. This intervention was adopted because it is expected to have a positive impact in reducing maternal deaths in the country (Fujita N, 2013).

Ministries of health tend to have two types of plan to address MMR. The first strategy which is called “fast track strategy” aims to respond to the challenge by focusing on short term interventions which could have a quick impact on reduction of maternal deaths in the country. Examples of these initiatives include provision of equipment and supplies, in service training and supportive supervision (Fujita N, 2013). The main objective of these road maps is “to provide skilled attendance during pregnancy, childbirth, and the postnatal period, at all levels of the health care delivery system” (WHO, 2004b). This indicates that increasing the availability of health workers is always linked to better health outcomes including achieving MDGs.
The vast majority of maternal deaths occur in middle and low income countries. The shortage of skilled birth attendants is one of the main reasons behind high MMR (Prata et al., 2009). The main reason for reduction of MMR is the investment spent in increasing availability of SBAs especially in remote rural areas. This is the case in Egypt, Zimbabwe and Indonesia (Fauveau et al., 2008). Many countries have developed road maps to reduce maternal mortality in order “to provide skilled attendance during pregnancy, childbirth, and the postnatal period, at all levels of the health care delivery system” (WHO, 2004b).

The skilled birth attendant has been defined as “an accredited health professional such as midwife, doctor or a nurse who has been educated and trained to proficiency in the skills needed to manage normal pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications of women and new-borns” (WHO, 2004). Accordingly, the skilled birth attendant could be an obstetrician, doctor with midwifery skills, nurse with midwifery skills or midwife (Fauveau et al., 2008).

Investment in training of midwives in midwifery skills and doctors in obstetrics has been carried out in many African countries including Senegal, Malawi and Tanzania. Complications related to maternal health could be managed by trained health workers with midwifery skills (Bhutta et al., 2010). One of the main reasons behind the success of many countries in reducing maternal mortality is that these countries became able to train and deploy suitable numbers of midwives to work in rural areas where their skills and competencies are needed most (Rosskam et al., 2011). One of the main advantages of recruiting midwifery trainees from their local communities is that these cadres are likely to provide health services that are culturally appropriate (Fauveau et al., 2008). Unlike doctors, midwives are expected to be available in rural settings (Mathai, 2008).

To accelerate producing large numbers of midwives within a short period of time, training programmes may pay more attention to the acquired competences and developed skills. Later this may require more in-service training programmes coupled with supportive supervision to mitigate the knowledge gap. Such a case was reported in Indonesia; however, these activities may take more financial resources (Fauveau et al., 2008). Professional associations such as obstetrician associations may play a major role in training midwives in remote rural areas. This initiative was successfully implemented
in Bangladesh (Fauveau et al., 2008). Those midwives are providing a variety of services related to maternal health. These services include helping mothers to deliver their babies, antenatal and postnatal services and family planning services.

Training of rural women in midwifery is a challenge; sometimes it is difficult to deploy teachers and trainers to remote isolated areas (Fauveau et al., 2008). For instance, some countries like Zimbabwe have suffered from a shortage of qualified tutors to train midwifery trainees. To overcome this problem, training programmes for tutors have been introduced to fill the gap. The diaspora community who are working in the UK as highly skilled personnel in midwifery related disciplines were also invited to come for a short period of time to deliver some lectures and seminars for the midwifery trainees (Fauveau et al., 2008). However, there is no information of whether the diaspora community respond to this initiative or not.

What is making it more challenging is that the midwifery profession is not preferable in many low income countries particularly in Africa and Asia (Fauveau et al., 2008). This indicates that the policy makers need to consider the contextual factors that could have a negative impact on human resources for health strategies to reduce MMR in remote and rural areas (Fauveau et al., 2008). Given that it is difficult to find girls from remote underserved areas with appropriate qualifications to be enrolled in midwifery schools, it may be appropriate for health managers to coordinate with educational authorities to invest in secondary education in underserved areas (Fauveau et al., 2008). Low income countries need to adopt innovative approaches to solve the problem of provision of a qualified midwifery cadre at health facility and community levels in remote underserved areas (Fauveau et al., 2008).

Training of midwives is a real challenge in low income countries. In many low income countries there are Traditional Birth Attendants who are still providing their services particularly in remote rural areas. The problem with those TBAs is that they are not part of the health system. Hence dealing with them becomes a real challenge for ministries of health. The problem is that most of these TBAs are illiterate; hence recruiting them in the civil service is a real challenge, as recruitment in the public service sector is mainly based on recruiting health workers who hold academic or professional certificates. They have lesser skills in terms of performing medical tests related to antenatal care and prenatal care services. In general the TBAs are older women (Fujita N, 2013).
TBAs have been defined as informal birth attendants who are not part of the health system, nor exposed to any kind of formal training, and provide their services in remote communities away from hospitals and health centres (Fauveau et al., 2008). Some ministries of health decided to provide shorter training for TBAs and send them back to their communities. However, this experience was considered unsuccessful for many reasons. One of these reasons include, the TBAs were unable to transfer the complicated cases to the hospitals because these TBAs are not part of the health system (Fauveau et al., 2008). Other reasons include the fact that these training programmes are not competency based; moreover, the case loads for TBAs may be low, hindering their skill potential (Sibley et al., 2004). Training of TBAs was recommended by the WHO in the 1990s, however, in practice, this sort of training programme failed to achieve the stated targets related to the reduction of MMR. After that the WHO declared that training of TBAs should be supported by other training programmes to accelerate reduction of maternal mortality (WHO, 1999). In Pakistan, TBA training succeeded in achieving a minor reduction of maternal mortality but not a significant reduction (Jokhio et al., 2005). Still the evidence for the efficacy of TBAs in reducing maternal mortality is debatable in the literature (Sibley et al., 2004). The countries which invest in training TBAs tend to believe that providing rural mothers with some kind of assistance is better than no support of any kind (Bhutta et al., 2010).

2.6.3. Task shifting initiative

This intervention is always recommended as a practical response to the shortage of highly skilled professionals in remote rural areas. This intervention is believed to be appropriate in terms of ceding tasks of doctors to nurses or medical assistants after being trained on new tasks. Task shifting is considered one of the promising strategies that could help in achieving MDG5 (Dawson et al., 2013). Garces et al. (2012) reflect on the importance of enhancing the role of community health workers by exposing them to training programmes to enable them to provide maternal health services such as uterine massage and appropriate neonatal resuscitation practices. According to Prata et al. (2010), sepsis could be managed by midlevel health workers trained in using preassembled packages of antibiotics. One of the main advantages of task shifting is that it might mitigate the reliance on highly skilled professionals for maternal health services (Jennings et al., 2011). According to Brown and Grimes (1995), nurse
midwives are permitted to perform the tasks of obstetricians, however in these situations nurse midwives tend to use less advanced technologies.

Enhancing the scope of practice by allowing VMWs to distribute contraceptives or medical assistants to provide antenatal care, after providing them with basic training, could improve access to health services. Such task-shifting initiatives could fill the gaps in areas where there are no health visitors (HVs) or assistant health visitors (AHVs) to provide such services, which is especially the case in rural areas (FIGO, 2009). The delegation of some tasks to lower-level staff, for example caesarean sections, could be delegated to medical assistants who have received training in surgical techniques. Also, anaesthesia in obstetric emergencies could be provided by trained lower-level health workers, as is already being done in some low income African countries (Mathauer and Imhoff, 2006).

According to Dawson et al. (2013), training doctors and mid-level health workers and allowing them to perform an emergency obstetric (EmOC) service seemed to be a cost-effective practice. Task shifting is supported by the Addis Ababa Declaration (2008) (Prata et al., 2009). Medical officers were trained to perform surgical operation related to maternal health, including performing caesarean sections. This experience shows outcomes similar to the outcomes when the same operations were performed by obstetricians. Caesarean sections could also be performed by medical assistants who receive further training (Mathai, 2008). A study conducted in Benin showed no difference in quality of counselling services conducted by nurse midwives and the lay nurses to whom these tasks had been shifted (Jennings et al., 2011).

There are examples of task shifting practices related to a variety of maternal health services whether in normal or emergency obstetric situations. A group of Indian general doctors were trained in EmOC for 16 weeks, and then deployed to the needy hospitals (Dawson et al., 2013). Studies conducted in Tanzania, Malawi and Ethiopia found that patient outcome is quite similar whether obstetric surgery is provided by doctors or medical assistants who receive special training (Dawson et al., 2013). In Ethiopia no difference was found between physicians and non-physicians in reported maternal deaths as a result of caesarean section (Gessessew et al., 2011).
Successful experiences related to task shifting in maternal health services can be found in many African countries. These experiences need to be discussed in order to import useful lessons. In Mozambique medical assistants were trained in major obstetric surgeries; those assistant medical officers were the key providers in district hospitals who produced similar patient outcomes at a significantly lower cost compared to physician obstetricians (Pereira et al., 2011). The evaluators of that programme believe that it is a successful initiative with reduced cost compared to doctors cost (Bhutta et al., 2010).

Tanzania also has trained more than one thousand medical assistants in emergency surgeries related to maternal health such as caesarean sections. The Tanzanian experience has also shown no difference in the quality of obstetric operations performed by medical assistants when compared to those performed by doctors (Bhutta et al., 2010). In India non-specialists have been trained to deliver emergency obstetric care services in areas with a severe shortage of obstetricians (Mathai, 2008). These trained medical assistants serve in underserved areas (Kruk et al., 2007).

Anaesthesia is necessary for surgical operations but anaesthetic responsibilities related to emergency obstetric care may be shifted from anaesthesiologists to general doctors (Dawson et al., 2013). Due to severe shortages of anaesthesiologists, more than 100 countries have started to shift anaesthetic tasks to mid-level health workers (Mavalankar and Sriram, 2009; Mavalankar et al., 2009). Due to shortages of anaesthetist, this task might be provided by non-specialists after being trained to do the job (Mathai, 2008).

In many South Asian countries groups of midlevel cadres have been selected and trained to perform anaesthesia in areas with a shortage of anaesthetists (Bhutta et al., 2010). In Bangladesh doctors were trained in obstetrics and anaesthesia for one year while nurses were trained in midwifery skills. As a result of these training programmes, utilization rates increased by more than 50% in the areas targeted by the intervention (Bhutta et al., 2010). In Mozambique medical assistants with previous experience in surgical operations were trained for three years in caesarean section. After that their performance in caesarean section was compared with obstetricians’ performances. The comparative study showed only a slight difference in quality between the two groups. This promising experience needs to be brought to other low income countries in order to transfer lessons if possible (Bhutta et al., 2010).
There are examples from some African countries that nurses and midwives provided EmOC services with lower quality than the services provided by medical doctors (Gerein et al., 2006). Some authors have considered enabling the community health workers to provide primary healthcare services as some sort of task shifting (Jennings et al., 2011). Some components of reproductive health services have been successfully delivered by community health workers in Kenya (Selke et al., 2010). This initiative has been supported by community leaders. Community health workers have been trained in many countries to perform tasks related to primary health care either alone or as part of bigger health teams (WHO, 2012). Other examples of task shifting include lay nurses taking some responsibilities of nurse midwives. The difference between these cadres is that nurse midwives are educated cadre who receive training in nursing and midwifery, while lay nurses do not receive any sort of formal education prior to their pre service training (Jennings et al., 2011).

However, there are many problems and barriers associated with task shifting initiative. For instance, highly skilled personnel could resist ceding tasks to mid-level or lower cadres; possible reasons behind this behaviour include that they may lose earnings (Jennings et al., 2011). The initiative may be let down by some health professionals who believe that ceding tasks will break down their power. Doctors may perceive the task shifting initiative as a threat to their power (Cumbi et al., 2007; Dawson et al., 2013). Also there are concerns that lower level health workers may fail to manage complicated cases (WHO, 2012). Resistance from senior clinicians was reported as one of the barriers that hinders effective implementation of the policy (De Brouwere et al., 2009).

There are also problems associated with effective implementation of the policy. For example, informal user charges have been also reported in studies conducted in Mozambique by Cumbi et al. (2007). In this study, non-physicians to whom tasks related to obstetric care have been shifted tend to charge these fees to increase their earnings. Barriers also include lack of equipment and supplies related to performing surgical operations. In such cases under-preparation might hinder effective implementation of the shifted tasks (Dawson et al., 2013). In a study conducted in India, some of the trainee doctors did not perform obstetric surgeries. These doctors believe that they have been forced to join this course which does not match their interest (Evans et al., 2009).
Task shifting may serve as a powerful mechanism to address the human resource crisis in middle and low income countries. However, this complex intervention needs a careful planning process and implementation procedures. A regulatory framework is very important (Colvin et al., 2013). Task shifting may happen without formal planning and prescribed regulations. Regulatory bodies may be reluctant to legalise this initiative for many reasons including concerns about patient safety.

Definition of tasks to be delegated is one key step to be discussed and agreed. Health workers to whom tasks are being shifted should have appropriate experience in the medical field (Jennings et al., 2011). Involvement of professional bodies related to the planned task shifting initiative should be involved to confirm acceptability amongst the affected groups (WHO, 2012). The affected groups include those who are supposed to cede tasks or those to whom the tasks may be shifted (WHO, 2012). Designers of the initiative should consider opinions and views of local health workers when planning the initiative (WHO, 2012). Also views of community leaders could be appropriate when designing task shifting initiatives based on the community.

According to Colvin et al. (2013), ongoing supervision is vital to sustain safe motherhood outcomes. Again task shifting practices need to be supervised to ensure quality is not being compromised. This indicates that supervision is always recommended whether the tasks are original or otherwise (Jennings et al., 2011). Follow-up support is important (Colvin et al., 2013). Dawson et al. (2013) have recently reviewed the published evidence on task shifting initiatives related to maternal health. Even though the authors conclude that task initiative might increase access to maternal health services, reduce the cost without compromising on the quality of provided healthcare services, again the authors recommended human resources management interventions to be considered to sustain effective implementation of the policy. These HRH interventions include financial incentives, supervision, in-service training, and career related interventions.

2.6.4. Financial problems in relation to recruitment

When securing sufficient financial allocations for midwifery training programmes in low income countries; policy makers and the members of the legislative councils might
not be aware of the importance of these programmes (Fauveau et al., 2008). Lack of opportunities for salary increase has been identified as one of the main factors that demotivates midwives (Hounton et al., 2009). Integration of midwives into the health system is expected to facilitate paying them regular salaries. The Cambodian government has successfully implemented “delivery incentive”. This incentive which was introduced in 2007 paid midwives as a reward for good performance. Accordingly, a midwife who safely delivers a live baby would receive up to $15. This initiative has a real impact on reducing the maternal mortality ratio in the country (Fujita N, 2013).

Health workers are exposed to a variety of disease hence, providing them with health insurance or any sort of social security programme is vital (WHO, 2006). In many African countries, high prevalence of HIV/AIDS represents a push factor for the health workers leading to increased attrition rates. Hence, providing free treatment for maternal health workers who may be infected is always recommended (Fauveau et al., 2008). Another strategy could be enrolling them in a health insurance scheme if possible.

In some low income countries, the main problem is to employ the trained providers in public sector posts. Sometimes and due to many factors including low salaries, maternal health workers may leave the profession. It could be appropriate if the government adopts strategies to attract them back to work. These strategies could also include those who retired while their communities are still in need of their services (Fauveau et al., 2008). Employing retired doctors to work as part-timers is also recommended as a strategy to utilise their services in underserved areas. However, this requires development of flexible measures which may need to be approved by civil service and medical authorities (Fauveau et al., 2008). However, some countries such as Kenya have succeeded in encouraging a number of retired midwives to work at community level as semi private workers (Fauveau et al., 2008). The posting of female doctors has played a major role in improving access to maternal health services in many rural areas (Padmanaban et al., 2009).

According to Gerein et al. (2006), it is difficult to increase the salaries of health workers in the public sector while excluding other professions. This could lead to frustration and strikes and other unexpected consequences. Maternal health workers may use coping strategies to increase their financial income. Doctors may tend to perform more
caesarean section operations in order to earn higher revenues. A caesarean section fee is considered higher than normal delivery fees. High caesarean section rate is a concern in some low income countries’ health facilities including South African private clinics (Gerein et al., 2006). Given that the mothers who deliver their babies through caesarean section have to pay more than what should be paid if the same woman delivers normally, this needs to be discussed amongst regularity bodies in order to explain and clarify these issues. In many areas increased caesarean delivery is presented as if it is a good achievement of the health system.

2.6.5. In service training

In service training is one of the main interventions related to human resources for health. Evidence from relevant literature shows in service training for maternal health workers has contributed to the reduction of MMR in many countries (Bhutta et al., 2010). An example of such a programme was conducted in Ethiopia to improve the skills of maternal health providers such as doctors and midwives in managing obstetric complications. This training programme was then assessed and the evaluation reports reflected remarkable progress in quantity and quality of the provided health services (Bhutta et al., 2010). A similar intervention was also implemented in Nepal where doctors and nurses were trained in providing anaesthesia for mothers. In Paraguay the intervention was focused on improving the skills of midwives and nurses to enable them to provide antenatal care at community levels (Ohnishi et al., 2007).

Generally deploying inexperienced doctors to rural areas without adequate professional support may enforce them to practice out of their scope of proficiency. This in turn exposes them to legal action as has been reported in South Africa (Wilson et al., 2009; Nemutandani et al., 2006). It is not acceptable for health system managers to deploy maternal health workers leaving them without monitoring and evaluation of their performance. Providing them with technical support is very important. Midwifery based competences need to be strengthened to ensure that the rural midwives are capable of saving mothers’ lives.

The training of midwives in new-born resuscitation may reduce the numbers of dead babies. According to Fauveau et al (2008), in service training is essential for community based midwives; these midwives may come into contact with complications that they
may not have addressed in their initial training. However, in service training would potentially fill the knowledge gap. It is very important to ensure that the trainers themselves are competent enough to effectively provide the required tasks (Fauveau et al., 2008). The problem of training programmes in low income countries is that they may not pay attention to the rural settings and high MMR in their own countries. Medical students from low income countries with high MMR should be prepared to deal properly with emergency obstetric care (Mathai, 2008).

Evidence from different countries shows that training programmes for maternal health providers have resulted in potentiating the skills and increasing the knowledge of the trainees. It facilitates provision of EmOC in the targeted areas by the trainees who can confidently manage complicated cases and refer in the appropriate time if needed (Bhutta et al., 2010). The trainees become aware of the procedures related to primary healthcare.

2.6.6. Enabling environment

Enabling environment in terms of availability of transportation and communication also has a clear impact on reducing the maternal mortality ratio (Fujita N, 2013). Home birth attendants (HBAs) sometimes work in areas which lack transportation services, creating a real challenge in appropriate referral of emergency cases when needed. This may result in increasing deaths as a result of deterioration of the mother’s health. This indicates that increasing the availability of SBAs needs to be supported by an effective referral system because the experience from Indonesia revealed that high mortality rates may happen as a result of lack of an effective transportation system (Fauveau et al., 2008). Availability of sufficient financial resources for tackling maternal health problems is always an issue in low resource countries. Provision of infrastructure with better living conditions makes the placements of midwifery cadre easier and facilitates employment of health professionals in remote areas (Fauveau et al., 2008).

Provision of equipment and supplies is essential for better maternal health outcomes (Bhutta et al., 2010). This is one of the most important interventions related to midwives as these midwives tend to have bags which contain the kits and other relevant medicines necessary for provision of home delivery services. The three delays related to maternal mortality are the delay which happens in taking the decision to seek care; the second
delay is associated with arrival time while the third delay happens in provision of the required care when the patient arrives at the health facility (Bhutta et al., 2010). Accordingly, creating an enabling environment should include interventions related to provision of ambulances and means of referral, paving roads, and equipping referral units with advanced equipment necessary to save women’s lives.

Increasing the availability of the emergency obstetric services is complementary to increasing availability of SBAs. The experiences from Bangladesh show that a significant reduction in MMR was observed in areas with increasing numbers of SBAs and emergency obstetrics care units in the presence of an effective referral system. Conversely, a slighter reduction of MMR was reported in areas with increasing numbers of SBAs but without investment in increasing the numbers of EmOC units (Chowdhury et al., 2009). Ambulances are considered to be one of the main services related to maternal health services. Low income countries might suffer a lot in running this service. Hence in many countries such as India a partnership between some regional governments and non-governmental organisations facilitates the running of this service. The government buys the ambulances while nongovernmental organisations take responsibility for running costs (Mathai, 2008). Another problem associated with these ambulances is the appropriate location to be stationed. This is a real challenge particularly in remote rural areas. The ambulances are always located in hospitals or medical centres, hence they can be utilised in nearby areas but not remote areas where severe complications might take place (Mathai, 2008).

There are two types of EmOC services, basic emergency obstetric services (BEmOC) and comprehensive emergency obstetric services (CEmOC). BEmOC include provision of services such as manual removal of placenta, assisted vaginal delivery, administration of antibiotics, and anticonvulsants. While CEmOC services include, the same services in addition to caesarean section and safe blood transfusion. CEmOC facilities should include an operation theatre to perform these services (Prata et al., 2009). EmOC services include providing professional support for complicated cases. These complications may occur as a result of obstetric labour and postpartum haemorrhage (Prata et al., 2009). It is very important to address the shortage of health facilities necessary to provide EmOC services particularly in areas with high maternal mortality.
Supervision is always recommended as a main intervention to ensure that maternal health services are being delivered perfectly and to provide technical support for the midwifery cadre (Fauveau et al., 2008). According to Fauveau et al (2008), supportive supervision is essential for community based midwives, in that these midwives may come into contact with complications that they may not address in their initial training. However, supportive supervision could fill the knowledge gap. It is very important to ensure that the trainers and supervisors themselves are competent enough to effectively provide the required tasks (Fauveau et al., 2008). Supervision can improve the competency of health workers by improving their skills. Skills are not necessarily improved by pre service training instead they can be improved by on-the-job training (WHO, 2006). Supervision is necessary to achieve better maternal health outcomes.

In many low income countries, lack of supportive supervision for midwives has been linked with lack of financial resources (Rosskam et al., 2013). Unfortunately, sometimes supervisory activities in low income countries tend to focus on filling forms rather than building the capacities of midwives (Rosskam et al., 2013). It is not acceptable for health system managers to deploy maternal health workers leaving them without monitoring or evaluating their performance. Supervising them with provision of technical support is very important. A well-functioning health information system is essential to enable sharing of maternal health data amongst different managerial levels. This is particularly important when it comes to maternal deaths. An information system is necessary for successful monitoring and effective evaluation of maternal health interventions (Mathai, 2008). Health workers like any human being prefer to work in a safe environment. According to the WHO (2006), maintaining health services in conflict and post-conflict areas is one of the main challenges facing many countries.

Highly skilled health professionals are always reluctant to serve in areas with security concerns or expected security problems at any time. Professional security is also important, for example one of the factors behind high attrition rates amongst Zimbabwean midwives in the late 1990s includes no recognition of the profession (Fauveau et al., 2008). The interventions confirm the importance of creating an enabling environment to ensure that the maternal health providers are motivated and willing to produce better health outcomes (Fujita N, 2013). It is believed that working as peers could facilitate successful management of obstetrics complications (Fauveau et al., 2008). The advantage of teamwork is that if there is a weakness in the skills and
performance of a team member, this gap could be filled by another teammate. Collaboration between maternal health workers is considered a key factor for sustaining a healthy work environment that facilitates better health outcomes (Mavalankar and Sriram, 2009).

Health workers feel satisfied when they deliver good healthcare services. This indicates that intrinsic motivators happen as a result of good performance (Gerein et al., 2006). Satisfaction could be reduced by working in understaffed health facilities with high attrition rates (Hall, 2004). Increased work load can lead to increased stress levels which in turn could have a negative impact on the quality of provided healthcare services (Gerein et al., 2006). When the health workers fail to provide high quality services, this may lead to less satisfaction which could contribute to high rates of staff attrition (Gerein et al., 2006).

Political commitment is very important for effective implementation of all interventions related to the reduction of maternal mortality ratio and for human resources management interventions. This includes securing sufficient financial allocations for the planned interventions; ensuring that monitoring and evaluation mechanisms related to reproductive policies are in effect (Fujita N, 2013). Policies related to reduction of maternal deaths include pre-service and in-service training programmes. They should also include interventions related to supportive supervision and incentives to facilitate availability of motivated staff with high retention rates (Fauveau et al., 2008).

Ministries of health need to have clear and written policies related to producing, deploying and retaining maternal health providers. These policies should be discussed and shared with relevant stakeholders. Those stakeholders could be from inside the health sector or from other nongovernmental organisations and United Nation Agencies such as UNFPA and UNICEF. Those partners are expected to offer technical and financial support for low income countries with high maternal mortality ratios (Fujita N, 2013).
2.6.7. Community related issues

Maternal health providers need to be aware of sociocultural beliefs before being deployed to the targeted communities (Bhutta et al., 2010). According to the WHO (2006), before deploying rural health workers to a particular rural community, factors such as background, language and social appropriateness of these health workers to rural communities should be considered. Cultural norms of rural women in low income countries always favour home deliveries. This reality needs to be understood when designing maternal health plans and road maps related to reducing the maternal mortality ratio (Bhutta et al., 2010).

Sometimes low utilization rates of maternal health happen as a result of other contextual factors rather than the availability of services. These contextual factors include cultural barriers and low education rates amongst rural women (Bhutta et al., 2010). Early marriage and early child bearing was found amongst the factors having a negative impact on maternal health in a study conducted in Nigeria (Marchie and Anyanwu, 2009). Empowerment and education of rural women has positively affected their health seeking behaviour and consequently reduces MMR (Bhutta et al., 2010).

Sense of achievement is very important for health workers as they become more motivated when they successfully perform their tasks or feel that their efforts are appreciated by the community. Many studies from different countries including Vietnam and Benin confirm the importance of recognition of the community and the professional communities in motivating health workers (Fauveau et al., 2008). Midwives should be respected by their local communities in order to motivate them.

2.7. Summary of the literature review

In this chapter the researcher has outlined the main issues related to human resources for health in middle and low income countries. These challenges include problems of staffing remote rural areas with health workers. Understanding the health workforce could help in adopting appropriate policies to attract them to rural health facilities and retain them. Hence the researcher has reviewed the literature related to workforce mobility. This includes Maslow’s hierarchy of needs, Herzberg’s motivation theory and the Henderson and Tulloch framework. The latter was considered to provide a better
understanding of factors related to motivation and retention of health workers. After examining the literature related to staffing remote rural areas, the researcher has modified this framework by linking the relevant strategy for each of the identified factors. The researcher then becomes able to identify the CMOCs related to staffing remote rural areas with health workers.

The last part of the literature review chapter was focused on human resources for health interventions related to reducing maternal mortality. The researcher has chosen this focus in order to link the study to a specific health issue. Accordingly the researcher has outlined financial problems related to recruitment of maternal health workers in low income countries. In addition to that, task shifting and training related to maternal health services were outlined. Furthermore, enabling environment and community related interventions were summarised. This process has proved useful in identifying the context, mechanism and outcome configurations at the heart of this study’s methodology in seeking to ascertain what works, for whom, and in what circumstances. The next section will thus consider the context of Sudan.
Chapter three: Sudan

3.1. Introduction

Sudan is one of the largest countries in Africa bordering Egypt from the north, Libya from the north west, Chad from the West, Central African Republic from the South west, South Sudan from the south, Ethiopia and Eritrea from the east and the Red Sea from the north east (UNFPA, 2012; F.M.O.H, 2012b). This Sub-Saharan African low income country consisted of 25 states until 2011, when the country split into two countries following a referendum of people of the southern part of the country who then chose to separate from the mother country. After the secession, the northern part of the country has kept the name Sudan while the new country was named South Sudan and consists of ten states (F.M.O.H, 2012b; UNFPA, 2012).

In the decentralised system Sudan consists of 15 states. In 2013 this increased to 18 after dividing Darfur into five states instead of three, and Kordofan into three rather than two states. Each state has some form of relative autonomy as each has its own legislative council; however, many states are relying on annual subsidies from the federal government. The total population in 2012 was 35,055,538 with an annual growth rate of 2.5 and fertility rate of 5.9. The health indicators are poor, for example life expectancy is 65 years (C.B.of.S, 2011). The World Bank has classified Sudan as a low-income country (Decaillet et al., 2003). Sudan is a multi-cultural country with more than 400 local languages spoken (O'Dempsey and Munslow, 2006). However, this figure represents Sudan before the secession of South Sudan in 2011.

Males are head of the households; generally if the male decides to move from place to place then the rest of the family should follow him. The rural population represents 67% of new Sudan; 9% are nomads. Illiteracy is estimated at around 48% of the population, illiteracy is higher amongst women than men. Generally women have low school attainment compared to men particularly in remote and rural areas. Poverty is spread in the country especially in conflict areas. Only 21% of women have economic participation while the majority of them are dependents to men whether husband, father or brother (UNFPA, 2011).
3.2. The impact of conflict on the economic situation

Civil war has hampered economic progress in the country. Sudan has suffered a long history of conflict since its independence in 1956 and the history of civil war concerns fighting between the north and the south. In 2005, a comprehensive peace agreement was signed between representatives of SPLM (Sudan People’s Liberation Movement) who represent the political wing of SPLA (Sudan People’s Liberation Army). This agreement, which was signed in Kenya, led to the end of the conflict and later facilitated the peaceful separation of the southern part of the country in 2011 called South Sudan (IHP, 2013; UNFPA, 2012).

The conflict in Darfur started in 2003 between the government and originally two groups of rebels. They are the ‘Justice and Equality Movement’ and the ‘Sudan Liberation Army’. After the separation of South Sudan, rebels from South Kordofan and Blue Nile States who tend to be part of Sudan People’s Liberation Army decided to form the Sudan People’s Liberation Movement/Army - Northern Sector. Later in 2012 these rebel group created the Sudan Revolutionary Front which represents a coalition between the rebel groups from Darfur, South Kordofan and Blue Nile. The conflict in
Darfur led to the displacement of thousands of people from their original villages to live in temporary camps around the big cities in Darfur region (UNFPA, 2012).

Despite signing a peace agreement in 2011 with some Darfur rebel groups, the main Darfur rebel groups still refused to join the peace process. Hence, the conflict still continues in Darfur, southern Kordofan and Blue Nile states resulting in deterioration in economic development, education and health service delivery particularly in conflict zone areas. The on-going conflict has led to increased allocation of financial resources to maintain security in conflict areas at the expense of economic and social welfare, causing a rise in unemployment and poverty rates. Thus, the government may pay more attention to maintaining security at the expense of provision of healthcare. On the other hand, economic sanctions from the US government have also affected the country’s access to spare parts and technological tools required to run important sectors such as railways, airways and agricultural schemes which are highly dependent on western technologies. This has affected the operation of these schemes resulting in the significant loss of thousands of jobs (UNFPA, 2012).

The division of South Sudan with 8,260,490 people means that one quarter of the population enjoys two thirds of the oil, while three quarters who live in north Sudan enjoy only one third of the petrol oil. This indicates that the split was economically to the advantage of southern Sudan, resulting in bad economic consequences for the population of Sudan. This led to further deterioration in the economic situation in Sudan particularly from 2012 onwards. For example, there is a shortage in the supply of foreign currencies such as US dollars and as a result the US$ exchange rate has increased from 2 SDG in 2010 to 7 SDG in 2013. The deterioration of Sudanese currency has resulted in dissatisfaction among civil servants. Large numbers of highly skilled personnel have started to migrate outside the country (UNFPA, 2012). These segments of new migrants include university staff and health professionals including doctors and other highly skilled health workers. The main recipient countries include Saudi Arabia and other gulf countries. In addition, there are around 3000 Sudanese doctors working in the UK and the Republic of Ireland (F.M.O.H, 2012b).

3.3. The health sector

The history of modern health services started when the British Army began to provide health services for the Sudanese people in 1899. Later in 1924 they established a
governmental body responsible for health; this body was named Ministry of Health in 1949 (Bayoumi, 1979). Now there is a Federal Ministry of Health in the capital Khartoum and there are ministries of health within each state and again within each state ministry there are local health authorities (WHO, 2007). This indicates that the health system is a three-layered system. FMOH is responsible for general planning such as formulating national polices and planning for human resources at the national level. The SMOH is responsible for the implementation of central polices and detailed planning. The local level is responsible for the direct delivery of Primary Health Care (PHC) (Badr, 2007a; F.M.O.H, 2010c; WHO, 2007).

Health services were provided free of charge until the 1970s when the government decided to introduce user fees. The reason behind this policy is that the government could not afford to finance the health services as a result of the increased cost of healthcare services. The Sudanese health system always tries to adopt staffing strategies relevant to its situation and guided by its actual needs. Universal health coverage will not achieve its aims by focusing on quantity rather than quality. Hence potentiating the skills of available health workers through in service training and supportive supervision is important (F.M.O.H, 2008; EMRO, 2004).

A federal system was implemented gradually from 1991; this was followed later by the decentralisation of the health sector. The health sector could be considered an underfunded sector because the total spending on health is only 1.5% of the Gross Domestic Product (GDP) representing 5% of the governmental budget. Most of the Sudanese rely on out of pocket payments as the main mechanism for financing their health services. Only one third of the population receive their healthcare services through the health insurance programme. However, police and army have their own hospitals, which provide them with comprehensive healthcare services (WHO, 2007; NHIF, 2012a). In 1994, social health insurance was introduced in addition to the functioning user fees system. The main objectives of the NHIF are:

- To manage the national health insurance scheme capable of providing healthcare services for the insured.
- To reduce the burden of financing healthcare services from the government.
- Reduce the need of seeking curative care abroad by improving the quality of the provided healthcare services.
• Attract and retain health professionals by providing them with financial incentives and better working conditions.

• Promote equal access to healthcare services for the insured in all states.

Source: Health Insurance Act of 2001

According to the Health Insurance Act of 2001, all employees of the public and private sectors should join the scheme. However army and police forces are excluded because they have their own hospitals, which provide healthcare services to them and their families. NHIF is funded by the contribution of the insured that pay 10% of their salaries. The employer pays 60% of the premium while the remaining 40% is paid by the insured employee. Self-employed have to pay flat rates, which tend to be updated every four or five years. The government pay for University students, retirees of the public sector, and for the poor families through Zakat chamber. The National Social Insurance Fund pays for retirees of the private sector. Co-payment is applicable for medicines, in that the insured have to pay 25% of their prescriptions. NHIF provides its services through different health facilities; these health facilities could be affiliated either to ministries of health or NHIF (Sudan, 2001).

The NHIF is providing healthcare to the insured through two methods. The direct Method of Health Services Provision through which the NHIF tend to deliver healthcare services through health facilities, which belong to the fund. The other method called indirect method, is when the NHIF delivers healthcare services through contracted health facilities mostly owned by ministries of health of the states (NHIF, 2012b; Ahsan, 2012).

3.4. Human resources for health

Human resources for health represent the cornerstone of healthcare delivery. As stated earlier, the Sudanese health system is composed of federal, state and local levels (F.M.O.H, 2009a). The role of the FMOH (federal level) is to develop human resources and planning while formulating national health policies. The main responsibilities of the state ministries of health (SMOH) are the management and implementation of national policies related to human resources for health. Looking at the health workforce in Sudan, more than 80% belong to the FMOH/SMOH (F.M.O.H, 2009a; Badr, 2007b). The rest are distributed amongst the private sector, military forces, the police, health
insurance and universities. HRH is governed by the civil service regulations. This means that health workers' employment conditions are more or less similar to those applied to other government employees (F.M.O.H, 2012b). Sudan's health workforce operates within the context of a decentralized system. The doctors, pharmacists and dentists are recruited and deployed by the FMOH. Other cadres, such as nurses, medical assistants and midwives are recruited and deployed by the SMOH (F.M.O.H, 2012b).

The health system performance and health indicators are regarded as poor, with figures below the benchmarks set by the MDGs (F.M.O.H, 2012b; F.M.O.H, 2009a). One of the main reasons for this is a shortage of health workers. The health worker / patient ratio is below the standard for all health professionals. Sudan is working hard to meet its MDG targets by 2015. The targets include reducing the infant mortality rate, improving maternal health and fighting malaria and other diseases. Two thirds of Sudan’s population live in rural areas and, in order to achieve real improvements in the MDG indicators, the country requires qualified, equipped and motivated health workers. The WHO (2010) pointed out; low-income countries including Sudan will not be able to meet their MDGs without solving the health worker staffing problem in remote rural areas.

The geographical distribution of doctors and other medical staff shows a clear bias towards urban areas, especially Khartoum State, where most of the doctors are located (F.M.O.H, 2012b; PHI, 2012). These findings are in line with the inverse law of care, which states that healthcare is always available for those who are less in need of it. Exacerbating this situation in Sudan is that 67% of the population live in rural areas where there are fewer health workers and hence less healthcare. The impact of this unbalanced distribution of healthcare staff on healthcare delivery in the Sudanese rural areas is profound (F.M.O.H, 2012b). Health service policy makers are searching for ways to improve the attraction and retention of staff in remote areas. However, the development of appropriate strategies requires an understanding of the factors that influence healthcare workers’ decisions to accept and/or stay in remote posts, and which strategies for improving attraction and retention are therefore likely to be successful.

There is a severe shortage of health professionals in Sudan. Attrition rates are very high due to continuous migration of highly skilled personnel outside the country (F.M.O.H, 2012b). Recent statistics speak of thousands of doctors who have migrated outside the country in the last two years. The country spends a lot to train medical doctors who then
easily migrate. Sudan trains and produces around 3000 doctors annually, however, the health system is unable to retain them. The problem with doctors is that they are marketable and likely to migrate outside the country for many reasons including wage difference between Sudan and the recipient countries. Most of the private hospitals are located in the capital Khartoum. Thus many health professionals prefer to work in Khartoum to receive an income from both the public and private sector (PHI, 2012).

There are 75 health related programmes offering university degrees or diplomas. These educational programmes are organised by universities and health institutes such as the Academy of Health Sciences (AHS) which belong to FMOH. The AHS was established in 2005 to raise the level of midlevel cadre such as nurses and midwives. AHS has established branches in most of the states. Midwifery schools which belong to Reproductive Health Directorates within the SMOH have been affiliated to the AHS since 2005. In response to the severe shortage of midlevel cadre the Academy of Health Sciences was established in order to address the skill mix imbalance and to train midlevel cadre such as midwives, medical assistants and nurses. Those midlevel cadres are more likely to work in underserved and remote rural areas. Midwives are the cadre who assist the majority of the country’s births (F.M.O.H, 2012b; Badr, 2007a).

3.5. Maternal mortality in Sudan

Many low-income countries are facing poor maternal health. According to the World Health Organisation, about 358 000 women die every year during pregnancy or child birth. Maternal health workers are important to ensure skilled birth attendants attend births that take place in homes or at health facilities. There has been a reduction in MMR, however, it is still considered high. The reason could be the vast majority of deliveries take place at home rather than hospitals or medical centres. Other reasons could be lack of trained midwives in these areas (F.M.O.H, 2012b; F.M.O.H, 2009b). In 2006 a Road Map was constructed in Sudan to tackle maternal mortality issues. These plans were set at the federal level and each SMOH then has its own implementation plan. Training and upgrading of midwifery cadre, provision of EmOC services and raising health awareness of rural communities are amongst the main objectives of these road maps (F.M.O.H, 2009b).

These roads maps always focus on producing and training midwives, believing that they are the front liners available in remote rural areas for the provision of maternal health
services. Through this cadre we can achieve better health services for rural populations and could help in achieving MDG 5 which is targeting the reduction of MMR. This cadre could also help in reducing inequalities between rural and urban areas through improving access to the maternal health services in remote rural areas.

Reproductive health policy was launched in 2010 and reflects the political commitment of the government of Sudan to achieve universal access of maternal health services to all segments of the population including those who live in remote rural areas (F.M.O.H, 2010a). Sudan Household Survey 2010 reflected the remarkable progress in the reduction of MMR in most Sudanese states; however, the black box between the intervention and the outcome needs to be opened in order to explore and explain the how and why questions behind this reduction. This survey also shows that half of deliveries were assisted by midwives. This survey also revealed that EmOC were provided in only 46% of the health facilities. 79% of deliveries took place in homes while only 21% took place in healthcare facilities (C.B.of.S, 2011).

There is a functioning information system; however its completeness and reliability is always questionable among health officials. There is no comprehensive registration system for maternal death; as a result the country tends to rely on periodical surveys to estimate mortality related indicators as seen below:

Table 2 Maternal mortality surveys

<table>
<thead>
<tr>
<th>Name of the survey</th>
<th>The scope of the survey</th>
<th>Year</th>
<th>MMR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sudan Demographic and Health survey</strong></td>
<td>Sudan before the secession of South Sudan</td>
<td>1990</td>
<td>554</td>
</tr>
<tr>
<td><strong>Safe Motherhood Survey</strong></td>
<td>Sudan before the secession of South Sudan</td>
<td>2000</td>
<td>509</td>
</tr>
<tr>
<td><strong>Census</strong></td>
<td>Sudan before the secession of South Sudan</td>
<td>2008</td>
<td>436</td>
</tr>
<tr>
<td><strong>Sudan Household Health Survey</strong></td>
<td>Sudan before the secession of South Sudan</td>
<td>2010</td>
<td>215</td>
</tr>
<tr>
<td>Maternal Death Review</td>
<td>Sudan after the secession of South Sudan</td>
<td>2011</td>
<td>186</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------------------</td>
<td>------</td>
<td>-----</td>
</tr>
</tbody>
</table>

Source: UNFPA, FMOH, CBoS

However, the Maternal Death Review introduced in 2009 to provide accurate estimates to maternal health indicators seemed promising. This review provides estimates for MMR for the years 2009 onwards (F.M.O.H, 2012a). Strong information system could help policy makers in the monitoring, evaluation and reforming of current initiatives for further improvement. Recent reports show significant improvement in MMR, however, still far from MDG targets (C.B.of.S, 2011; F.M.O.H, 2012a). MMR could only be reduced if the health system ensures that the SBAs are available in all health facilities to provide their healthcare services. In recent years there has been growing interest from the Sudanese government to reduce MMR, accordingly staffing related intervention was being considered. In the next section the researcher will provide an outline of the planned interventions which have been identified from the Sudanese policy documents related to staffing underserved areas with maternal health workers.

### 3.6. Strategic interventions related to staffing rural areas with maternal health workers from the policy documents

Sudan is committed to meeting the MDGs including reducing MMR by three quarters by the end of 2015. In order to achieve MDG5, maternal health problems need to be addressed. These strategic interventions have been identified from the strategic plans related to human resources for health and strategic roadmaps related to reduction of maternal death. These road maps have considered the main issues related to motherhood, which include skilled birth attendants, antenatal care, family planning and emergency obstetric care. One of the main objectives of these strategic interventions is to produce and maintain skilled, motivated midwifery cadre capable of saving mothers. These interventions aim at improving accessibility to competent midwifery cadre during birth, antenatal and postnatal periods particularly in remote rural areas.

In this section, the researcher is going to shed light on the planned interventions with a particular focus on issued related to human resources components. These components include issues related to working conditions, training, recruitment, financial incentives,
and task shifting and community interventions. These cost-effective interventions are believed to have a high impact on improving maternal health particularly in remote rural areas. These strategic interventions will be combined with the strategies in the literature review chapter to formulate the CMOCs.

3.6.1. Strategic interventions related to working conditions

Strategic interventions related to working conditions are aimed at saving mothers and improving the quality of maternal health services in the community and health facility levels. One of the main mechanisms for improving the working conditions includes providing rural health facilities with medicines, equipment and supplies related to maternal health. This equipment includes communication equipment to be used for the referral system between community and all levels of care. Given that midwives have no or poor access to supplies and medications, equipping and supplying them with appropriate medications and tools necessary to perform their jobs is one of the main included targets related to improving working conditions. The activities within these plans also include providing midwives with cell phones to facilitate communication (F.M.O.H, 2010a; F.M.O.H, 2009b; F.M.O.H, 2006).

To ensure that maternal health services will be accessible for all rural women, the establishment and expansion of mobile clinics can provide reproductive health services for the nomadic communities along with setting up of maternity homes to facilitate access to EmOC services. Mobile clinics are expected to facilitate provision of maternal health services for inaccessible areas. To enable midwives to perform family planning, kits should be distributed to VMWs to enable them to provide family planning services for the rural populations. Provision of means of transportation such as vehicles is expected to facilitate supervision and on the job training. Mobile clinics are intended to facilitate provision of maternal health services for the rural nomadic communities (F.M.O.H, 2009b; F.M.O.H, 2006).

Interventions such as rehabilitation of health facilities and ensuring that they are clean, along with equipping the health facilities with basic and advanced EmOC in hospitals and health centres are expected to have a positive impact on the outcomes related to maternal health services. Other recommended interventions include the establishment of
maternity homes at villages and neighbourhoods in order to facilitate the provision of antenatal and postnatal care services. Strategic interventions always focus on creating an effective referral system capable of linking rural facilities with referral units that can provide EmOC services (F.M.O.H, 2009b).

Given that improving working and living conditions in order to improve health outcomes may require the efforts of other stakeholders who could be outside the health sector, the plans emphasise the need for coordination and partnership with water and sanitation authorities, education and paving roads authorities. Given that females are dominating the health workforce, attracting them to remote rural areas through developing and approving a female-friendly policy for jobs in the underserved areas will encourage them to work in the rural areas (F.M.O.H, 2012b).

3.6.2. Strategic interventions related to supervision and human resources management:

Strategic interventions related to supervision and human resources management are aimed at creating an enabling environment through the different activities such as implementing supportive supervision activities which might have a real impact in improving maternal health staff practices such as enabling them to manage obstetric complications and to improve other skills related to maternal health services. Planned activities also focus on providing in service training through supervision visits to make sure that midwives are capable of managing obstetric complications. Given that there is too little supervision for VMWs, the plans aim at provision of supportive supervision to VMWs especially in remote areas. The plans also aim at supporting outreach activities to support and supervise VMWs. Supportive supervision is expected to help the staff to improve their practices, and improve the quality of the provided healthcare services through maintaining a high standard of healthcare services for the population (F.M.O.H, 2009b; F.M.O.H, 2006).

In order to improve the information registry system the Maternal Death Review (MDR) was established and was expected to improve the recording of admission, delivery and death registration of mothers. Development of standards and protocols related to maternal health services ensures that the provided healthcare services are in accordance with quality standards. In the performance management area, the activities include, implementing systems for reducing staff absence; system for performance-based rewards and sanctions. These rewards could be financial or nonfinancial incentives. In
that the performance incentives for midwives through technical support might encourage midwives to stay at the community level, other strategic interventions include decentralization of basic obstetric services which might facilitate provision of these services in underserved states. The strategies have also focused on teamwork activities which are expected to have a positive impact on the performance of health workers (F.M.O.H, 2009b).

3.6.3. Strategic interventions related to skills and training:

Strategic interventions related to training include increasing knowledge and experience of village midwives in life-saving skills through training and upgrading the current midwifery workforce which might improve maternal health outcomes. However, there are some problems which have faced implementing training programmes such as training sites which are not well furnished or equipped with training materials. These training sites suffer from poor physical conditions. This may negatively affect the quality of training programmes. Hence the plans have included activities related to equipping training sites with the required materials and supplies to ensure successful training programmes (F.M.O.H, 2009b; F.M.O.H, 2009a; F.M.O.H, 2010b).

Training of midwives and nurses from rural areas in the academy of health sciences and then returning them to their post is expected to positively improve the quality of the provided health services in rural areas. The mechanisms for implementing training include rehabilitation and expanding training institutions and increasing the number of competent tutors for basic and in service training. In order to improve the performance of new midwifery trainees, the curricula have been revised to include training sessions relevant to life saving obstetric care. Providing each village with a trained midwife is one of the main objectives of Sudan Declaration of Safe Motherhood which was signed in 2001 by all States Ministers of Health (F.M.O.H, 2009a).

The upgrading of midwives and the training of general doctors in emergency obstetric care (EmOC) is amongst the main strategic interventions in the road maps. To respond to the challenge of staffing rural areas, it is very important to increase the number of midwives because these cadres are more likely to stay longer in remote and rural areas than doctors. Increasing the number of village midwives (VMWs) so as to provide each village with one will improve maternal health in rural areas (F.M.O.H, 2009a).
Increasing the knowledge and experience of VMWs in life-saving skills through training and the upgrading of the current midwifery workforce will also improve maternal health outcomes. Continuous in-service training programmes for practising VMWs at both facility and community levels is expected to improve their skills, including enabling them to manage obstetric complications. It is also expected to increase their satisfaction and could therefore improve their retention. EmOC training programmes for general doctors, aimed at redressing the severe shortage of obstetricians, especially in rural and underserved areas along with the training of midwives and nurses from rural areas at the Academy of Health Sciences and then returning them to their posts is expected to produce good outcomes in terms of improving the workers’ satisfaction and skills, and hence the quality and quantity of maternal health services provided in rural areas (F.M.O.H, 2009a).

Given that old TBAs who are still providing their services in some remote areas were unhappy with newly produced midwives and started to reflect a negative picture about the new trained midwives, involving them in the recruiting process of midwifery trainees might encourage them to be positive. Training for the practicing VMW at both facility and community levels is expected to improve midwifery related skills. Plans also include improving awareness of midwives on the importance of earlier referral of mothers to avoid complications as a result of delays. Early recognition of complications might facilitate proper pre-referral treatment and avoid further deterioration of a mother’s health. The plans also focus on updating maternal health workers by new protocols and guidelines relevant to maternal health through in service training programmes. Supporting rural midwives by continuous education and training is expected to enable them to manage obstetric complications; for example, training maternal health workers on fistula to enable them to manage complicated cases (F.M.O.H, 2009b).

The Sudan national EmOC survey, conducted in 2006, shows that only 25% of the hospitals have obstetricians, and most of these hospitals with obstetricians are located either in the capital Khartoum or other big cities (F.M.O.H, 2007). To respond to this problem training programmes are planned for doctors in EmOC in order to fill this gap. Training of general doctors in EmOC through in service and pre-service training programmes are expected to have a positive impact on maternal health services. The plans also try to respond to the shortage of specialists including obstetricians by
providing internal and external opportunities for professional training (F.M.O.H, 2012b).

### 3.6.4. Strategic interventions related to the financial incentives:

Performance incentives for midwives through financial incentives might encourage and facilitate the retention of midwives in the rural areas at community and facility levels. Incorporating VMWs into the health system as maternal health workers facilitates paying their financial remuneration. However, many midwives have no job security and no guaranteed income. Hence, the plans encompass activities which aiming at adopting advocacy efforts to support employment of large numbers of midwives (F.M.O.H, 2009b; F.M.O.H, 2006).

### 3.6.5. Strategic interventions related to the production, recruitment and deployment:

Sudan has a high maternal mortality rate, especially in rural areas, with severe shortage of qualified midwives given that 80% of deliveries take place at home. For different reasons, the majority of rural women do not go to the health facilities to give birth there; so, increasing the availability of qualified and trained midwives through the creation of a competent midwifery workforce will enable the provision of maternal health services at their homes which can lead to improving their accessibility to maternal health services including home delivery and hence reduce the maternal mortality rate. Improving the availability of health workers in rural and underserved areas will improve access to healthcare and health outcomes related to MDGs including maternal health (F.M.O.H, 2010a; F.M.O.H, 2009b).

To respond to the challenge of staffing rural areas, it is very important to increase the production of nurses and midwives because these cadres are more likely to stay longer in remote and rural areas than the doctors. Increasing the production of village midwives might enable the health system to provide each village with VMW and hence improve maternal health in rural areas. Hence the strategic plans also support the training of mid-level health workers closer to their communities. Given that there is direct correlation between the presence of trained birth attendants and maternal survival, strategic interventions have focused on providing trained birth attendants in each village. Deployment should be fair in order to focus on underserved areas with
appropriate skill mix to ensure that maternal health services are properly delivered (F.M.O.H, 2009a; F.M.O.H, 2006).

3.6.6. Strategic interventions related to task shifting:

Enhancing the scope of practice is also recommended in order to enable VMWs to distribute contraceptives or to allow Medical Assistants to provide antenatal care after providing them with basic training. This pre service and in service training programme for medical assistants in family planning and other antenatal care services can fill the gap in areas where there are no health visitors or assistant health visitors to provide the service especially in the rural areas. Even the distribution of contraceptives should be performed by health visitors; however, the plans support enabling midwives to do that in areas with no health visitors (F.M.O.H, 2009a).

3.6.7. Strategic interventions related to community involvement:

Sometimes the first delay of mothers happens as a result of lack of awareness amongst the community. Thus the strategic plans always focus on improving community awareness. The plan also focuses on health education programmes aiming at improving awareness in rural communities with maternal health issues. This might have a positive impact on maternal health services (F.M.O.H, 2009a).

3.6.8. Strategic interventions related to regulatory mechanisms:

Compulsory service would lead to improved presence of doctors in rural areas which in turn improves accessibility to maternal health services in rural areas (F.M.O.H, 2012b). This mechanism is expected to address the equitable distribution of doctors in Sudan.

3.6.9. Other strategic interventions included in the road maps

It appears that the image of the village midwife has declined in some areas and communities. This lack of a positive image contributes to a spiral that affects the village midwife in her work and attitude that is ultimately self-fulfilling and needs to be broken. A public information campaign by highlighting the capabilities and work of midwives and systematic celebratory days for midwives such as the International Day of the
Midwife might break this spiral as this can boost their image in the targeted areas and communities. Raising the image of midwifery through supportive campaigns is also included in these strategic plans. This advocacy effort for legalisation is expected to institutionalise midwifery and the Sudan Midwifery Association. Coordinating with donors and other stakeholders to utilise their funding in improving maternal health services is also one of the targets of these strategic plans (F.M.O.H, 2009b).

3.7 Conclusion

This chapter provided the general background about Sudan including contextual and socioeconomic information. The researcher also provided information about the health sector in Sudan outlining human resources for health. This contextual information will help the reader in understanding the findings chapter. The last part of this chapter includes strategic interventions related to staffing remote rural areas with maternal health workers from the policy documents. After introducing interventions, it is very important to monitor and evaluate them to determine which retention approaches work best, how they do so and why. Accordingly, a realist evaluation has been employed in order to explore and explain what works, what doesn’t, how and under what circumstances. The next chapter will outline this method and how the researcher has constructed and tested the CMOCs related to staffing remote rural areas with maternal health workers.
Chapter four: Methodology

4.1. Introduction

The researcher aimed to explore and explain what the functioning interventions are relating to staffing remote underserved areas with the maternal health workforce. Researchers tend to select a methodology which serves the research aims and objectives. In this chapter the researcher is going to describe the chosen methodology, data collection methods, data analysis tools.

4.2. Realist evaluation

Realist evaluation is defined as “a species of theory-driven evaluation that holds the view that programs are theories incarnate” (Astbury, 2013). This method is mainly concerned with finding refined explanations for programmes and interventions (Marchal et al., 2012). This method is considered to be appropriate because the researcher needs to understand how the staffing interventions related to provision of maternal health services work. The realist evaluation framework provides a promising basis for doing so. The researcher carried out a realist evaluation in order to evaluate these interventions. This research is not simply aimed at finding out what works and what does not but also how and in what circumstances (Pawson and Tilley, 1997; Pawson and Manzano-Santaella, 2012). The overall study is about the challenges of staffing remote rural areas of Sudan with health workers and, within that, the researcher uses maternal health as an example to explore and explain in detail what works, in which circumstances, and to what effect. In this section the researcher is going to provide an overview of the realist evaluation; its main concerns and shortcomings will be debated.

4.2.1. Background

This theory-testing method was firstly introduced by Pawson and Tilley in 1997. The authors have been approved as European theorists and rewarded for their contributions to theory-based evaluation (Astbury, 2013). Other publications which aimed to illustrate and develop the method were introduced later (Pawson, 2002; Pawson and Tilley, 2004; Pawson et al., 2005). Scientific realism is considered the philosophical foundation of realist evaluation (Marchal et al., 2012; Pawson, 2003; Tilley, 2000). This theory driven
evaluation is different from other forms of evaluations which simply aim at measuring outcomes. Realist evaluation instead aims to at provide a better understanding of both processes and outcomes resulting from a specific intervention or a family of interventions (Kazi, 2003; Marchal et al., 2010).

According to Astbury (2013), the main difference between the realist evaluation and other family members of theory driven evaluations is that the realist evaluation keeps its own philosophical positioning which identifies program theories in a realist language. The outcomes in realist evaluation could be intended or unintended by the intervention (Pawson, 2013). Thus, the focus of realist evaluation is to identify contextual factors along with causal mechanisms. The findings of a realist evaluation should take the form of explaining how and why an initiative “failed” or “succeeded” in achieving its objectives.

4.2.2. Key concepts related to realist evaluation

According to Astbury (2013), the components of realist causal clarification are characterised by the formula:

\[ \text{Context (C) + Mechanism (M) = Outcome (O)} \]

**Context** discusses the main circumstances that are on the point of enabling or limiting the initiation of program mechanisms (Astbury, 2013). In multifaceted social systems, it is possible to find a variety of interconnected strata of contextual dissimilarities that are capable of affecting for whom and under what situations a specific intervention works. These might include the effect of differences in individual capabilities and personal characteristics or the governmental and administrative setting for the intervention (Astbury, 2013).

**Mechanism:** A mechanism is the generative force that leads to outcomes. Mechanisms refer to what makes a programme or an intervention work or fail to work (Astbury, 2013; Abhyankar et al., 2013).

**Outcomes:**

The outcomes happen as a result of interaction between the mechanism and the contexts (Astbury, 2013). Realist evaluation looks for better understanding of how and why
different outcome differences are produced (Astbury, 2013). However, the outcome of a specific programme could represent the context for another intervention (Astbury, 2013).

**Context-mechanism-outcome (CMO) configurations:**

These CMOCs are considered to be the main phase of a theory-driven evaluation. According to Pawson (2013), one intervention may result in creating another endless chain of complexity. It is worth mentioning that the testing of CMOCs in realist evaluation is different from the hypothesis tests conducted by statisticians. While a statistical hypothesis is either accepted or rejected, CMOCs are more likely to be refined. This refinement includes presenting the findings with respect to what works, how and under what circumstances questions. In realist evaluation both qualitative and quantitative data can be utilised and analysed (Pawson and Tilley, 1997).

The CMOCs might be represented by tables, charts, connected chains and ladders of CMO configurations (Astbury, 2013). According to Pommier et al. (2010), the initial CMOCs could be modified, tested and refined with respect to empirical field work. The CMOCs should be in a tight form that link particular Cs and definite Ms and precise Os together (Astbury, 2013; Pawson, 2013). In realist evaluation the tentative CMOCs might be developed based upon understanding of a programme theory. This programme theory could be an intervention or family of interventions (Astbury, 2013).

When lacking sufficient evidence from the relevant literature to develop the CMOCs, these CMOCs could be developed from staff, managers, service providers or other relevant stakeholders including the researchers who are closer to the area of the research. The initial CMOCs could be formulated by gathering data from the relevant stakeholders or the relevant literature if found. The developed hypothesis should be in the form of CMOCs. These CMOCs should be tested through collection of data about the contexts, mechanisms and outcomes in order to cross-examine each of these propositions. The outcome of this process is a series of refined CMOCs (Abhyankar et al., 2013) According to Pawson (2013), this refinement might be presented in written text.

**CMO before and after testing:**

Pawson (2013), describes the format of CMOCs before and after testing as follows:
This indicates that different outcomes occur as a result of interactions between the intervention and the context.

4.2.3. Reflections on recent publications by Pawson

One and a half decades since the introduction of the method, the authors Pawson and Tilley have realised that the method was neither well understood nor correctly applied by many researchers. As a result Pawson and Santaella published what they called “A realist diagnostic workshop” (Pawson and Manzano-Santaella, 2012). This article tries to explain and clarify realist evaluation principles with practical examples from published works. This was followed later by “the science of evaluation: a realist manifesto” (Pawson, 2013) which tries to clarify the methodological misunderstanding by shedding light on selected examples from the literature that have problems with the application of realist evaluation principles. These recent publications (Pawson, 2013; Pawson and Manzano-Santaella, 2012) have really provided clear guidelines which will be very useful for those who want to pursue the realist evaluation in the future. Hence the researcher has utilised these recent publications in understanding the method correctly. According to Pawson and Santaella (2012), the CMOCs should be composed of associated and linked elements in order to be testable. Citing examples for imperfectly constructed CMOCs, they advise realist evaluators to make sure that the initial CMOCs are written in the right format as configurations not catalogues (Pawson, 2013; Pawson and Manzano-Santaella, 2012). According to Pawson and Manzano-Santaella (2012), realist evaluation stands in the middle between process and outcome evaluation. Furthermore, Pawson and Manzano-Santaella (2012), conclude that “Programmes do not come in pre-ordained chucks called contexts, mechanisms and outcomes. Rather these terms take their meaning from their function in explanation and their role in testing those explanations”. These clarifications which need to be considered by realist evaluators have clarified the methodological misunderstanding of the method.
4.2.4. Strengths and weaknesses of the method

Realist evaluation allows generalisation of the emerging evidence in similar contexts (Priest, 2006). One of the advantages of the realist evaluation is its capability to provide different types of findings for different categories of stakeholders (Tilley, 2000). One of the strengths of the realistic evaluation methodology is its focus on very important questions such as how and under what circumstances instead of reliance on simplified statistical data (Gill and Turbin, 1999). According to Gill and Turbin (1999) using CMOCs is “a useful method of teasing out how a measure might be working and in what circumstances it might not work”. This method has been successfully applied in a variety of areas including healthcare and community safety (Brookes, 2006; Byng et al., 2005). Thus, realist evaluation is about what intervention works, how achievement happens and under which context.

Considering the main weaknesses of the method, a key one is that it delivers complex findings, while some policy makers need ‘simple answers’ (Pawson and Tilley, 1997; Pawson and Tilley, 2009). According to Dickinson (2006), sometimes it is quite difficult to differentiate between the context and the mechanism in realist evaluation. Gill and Turbin (1999), believe that proposing plausible CMOCs might be relatively easy; however, collecting data about the three components of the CMOCs is harder and requires more time and adequate resources. In addition to that, the relative infancy of the realistic evaluation method has been considered one of the limitations of the method (Chambers et al., 2013).

4.3. How the researcher constructs the CMOCs

The researcher didn’t start constructing the enquiry from scratch, in that Pawson advises to build in what is already known (Astbury, 2013). Hence the researcher starts to build the initial CMOCs from the relevant literature. One of the main aims of the conducted literature review is to look for hypotheses and testable propositions related to staffing remote rural areas with health workers. The researcher was able to find these hypotheses and to formalise them in a table with three columns (see table 3). The first column is for the contexts; the second column for mechanisms; and the last column for the expected outcomes. One could ask why generating the CMOCs from published articles and policy documents represents the first step, rather than starting with interviews (from
Pawson and Tilley (1997) have recommended starting from scratch for building programme theories or CMOCs when the relevant evidence is not available or not accessible. When the evidence is not available, the investigator and the respondent co-develop these propositions (Pawson and Manzano-Santaella, 2012). However, in the case of availability of relevant evidence they prefer that the researcher in such circumstances should make use of the evidence to construct the initial CMOCs which might be tested through empirical study (Pawson, 2013).

According to Pawson & Tilley (2001) CMOCs could be derived from the relevant literature if there is previous evidence on the success of interventions relevant to the study. Hence, in this study the CMOCs were formalised in two steps. The first step is a literature review of the articles relevant to staffing rural areas with health workers. The second step is Sudanese health system documents related to human resources for health and maternal health related documents. The researcher was able to identify a set of plausible CMOCs which explain what work for whom and in what conditions. These CMOCs were then tested through forty one semi structured interviews with policy makers and front liners related to maternal health and human resources for health.

Table 3 Context Mechanism Outcome Configurations related to staffing rural areas with health workers in order to provide maternal health services and to reduce MMR

<table>
<thead>
<tr>
<th>Context</th>
<th>Mechanism</th>
<th>Outcome</th>
</tr>
</thead>
</table>
| Doctors do not like to go to rural areas | *Compulsory service.  
*Conditional licence that can only be fulfilled by working in rural areas  
*Rotation of medical doctors between areas  
*Specialised training opportunities in exchange for working in rural areas  
*Financial incentives | *Improve the presence of doctors in rural areas.  
*Improve access to maternal health services in rural areas. |
| Health workers do not like to stay in rural areas. | *Financial incentives  
*Appreciation from managers, | *motivate the staff and improve their satisfaction |
| Health workers/facilities in rural areas with poor working conditions | *Distributing maternal health related medicines, equipment and supplies to rural facilities.  
*Rehabilitation of health facilities and ensuring that they are clean  
* Establishment of referral mechanism (linked supervisor, communication, ambulances, vehicles) | *Encourage them to stay longer and reduce their turnover  
*Improve staff satisfaction  
*Facilitate supervision and on-the-job training.  
*Improve the quality of services.  
*Enhance referral system between rural and upper levels of care. |
| --- | --- | --- |
| There are remote rural areas without health facilities. | *Provision of mobile clinics  
*Mobile health  
*Establishment of maternity homes at villages and neighbourhoods.  
* Local recruitment  
*Equipment | *Improve the presence of health workers in rural areas.  
*Improve access to maternal health services for the rural nomadic communities.  
*Reduce maternal deaths in nomadic communities  
*Facilitate the provision of antenatal and postnatal care services. |
| Health workers who have children do not like to stay in rural areas | *Providing flexible working hours  
*Access to child care  
*Providing schools for their children | Improve their retention and satisfaction, and reduce turnover. |
| Health workers do not like to stay in rural areas with poor living conditions | *Availability of schools and qualified teachers.  
* Paved roads.  
* Clean water.  
*Providing electricity, telephone and internet services | *Improve staff retention and satisfaction and reduce turnover.  
*Facilitate provision of health services |
| Maternal health workforce with poor skills who are working in rural areas | *Supportive supervision  
*In-service training | *Improving the satisfaction of the maternal health workforce.  
*Improve their skills and knowledge  
*Encourage them to stay  
*Improve maternal health outcomes  
*Improve performance and quality of care in rural areas |
| --- | --- | --- |
| Village midwives (VMWs) who have no salaries may stop practising and leave the rural areas | *Incentives  
*Recruitment | *Encourage them to stay in the rural areas and keep providing their services |
| *Midwives who could not be considered as skilled birth attendants (SBAs)  
*The majority of rural women prefer home deliveries | *Training programmes  
*In-service training  
*Upgrading of current midwifery workforce | *Improve their skills and knowledge  
*Competent midwifery workforce in rural areas who are able to provide home deliveries  
*Improve access to maternal health services  
*Midwives become able to manage obstetric complications |
| Most rural hospitals have no obstetricians | *Training programme for general doctors in EmOC  
*Task shifting | *Fill the gap  
*Improve their knowledge and skills.  
* Obstetrics surgeries performed in underserved areas  
* increase provision of EmOC services |
| Rural areas without doctors | Task shifting for medical assistants (nurses who have received an additional two years of training) | *Fill the gap  
*Improve their knowledge and skills |
4.4. CMOCs based interview guide

This guide entitled “CMOCs based interview guide” was developed with respect to the developed CMOCs described in the table above. The main objective of this guide is to facilitate the collection of data about contexts, mechanisms and outcomes (see appendix 9.3). It is also expected to facilitate testing and refining of the CMOCs. One of the main challenges when applying realist evaluation is analysing the findings, in that the same body of qualitative findings may speak to different CMOCs (Pawson & Tilley, 2004, Pawson, 2013). Pawson & Tilley themselves declare that undertaking realist evaluation is not an easy job; it requires continual thinking and logical imagination in all phases related to identifying the relevant CMOCs, deciding who is appropriate to interview and which questions should be asked, and how to analyse and present the findings.

4.5. Clarification of methodological approaches

Qualitative data analysis enables the researcher to analyse human behaviour from the individual’s point of view (Miles and Huberman, 1984). Qualitative analysis generally allows the researcher to ask more about one particular issue and go deeper into the details of a phenomenon so as to gain a better understanding of the factors that explain behaviours (Gummesson, 2000). According to Halfpenny (1984), the strength of
qualitative research is that it enables a greater depth of description and more detailed explorations of the phenomena or topics studied. In qualitative studies, it is also possible to construct a conceptual framework. However, some authors, such as Miles and Huberman (1984), argues that the conceptual framework should not be stated ahead of time in qualitative research, but decided on only after the data collection and analysis is complete.

Conversely, positivism generally adopts surveys and questionnaires, which tend not to reflect reality so closely as qualitative research does (Hair et al., 2007). One of the weakness of survey-based research is that the respondents may answer the questions without fully understanding exactly what they mean (Gummesson, 2000). In qualitative methods, however, it is easier to correct these types of mistakes by asking further questions or conducting further interviews (Hair Jr et al., 2011). In this research, the researcher has decided to select the qualitative approach because it is important to learn about people’s feelings and why they behave in certain ways. Also, a survey would be inappropriate for answering research questions of this study as it would be very difficult to condense the topic into a set of standard questions with multiple-choice answers. The advantage of qualitative research is that it enables better exploration of a phenomenon, while the advantage of survey based research is that it enables hypotheses testing. Realist evaluation combines both advantages by enabling the researcher to explore a phenomenon and provide refined explanations of testable propositions or CMOCs. These findings should be presented with respect to the realist questions; what works, what doesn’t, how and under what circumstances.

4.5.1. Sampling techniques

Non probability sampling technique was used to identify the appropriate respondents. Hence purposive and snowball sampling techniques were used. Purposive sampling is essentially appropriate for qualitative research rather than quantitative research (Ritchie and Lewis, 2003). Snowball sampling is also known as ‘chain’ sampling (Noy, 2008). This sampling method is used in qualitative research related to the social science. Sometimes, the researcher may not know who the key informants in a specific area are; in this case the researcher might select an interviewee from a specific area. That respondent could recommend others that could provide useful information for the researcher (Flick, 2009). The researcher has used this method in identifying some respondents at federal and state levels.
4.5.2. Data analysis

The main purpose of the data analysis process is to present what the data revealed in well-structured format (Flick, 2009). Qualitative data could be analysed by different methods. For instance, discourse analysis, template analysis, and thematic analysis (Gummesson, 2000). The data will be analysed with respect to the study aims and objectives. Thematic analysis has been defined as a “method for identifying, analysing and reporting patterns (themes) within data” (Braun and Clarke, 2006). The advantage of this method is that it helps researchers to organize their data sets to be easily understood. Even though it could be used when there is an initial conceptual framework for the study, thematic analysis can additionally be used if there is no pre-existing conceptual framework (Braun and Clarke, 2006). Thematic analysis with respect to the initial theoretical framework and the developed CMOCs is deemed to be appropriate for this study because the adopted attraction and retention framework provides a good foundation for this analysis. The factors related to health workers’ retention which were identified by Henderson and Tulloch’s framework would facilitate the development of appropriate themes. Thus, the researcher will try to present the findings in themes related to financial incentives, working and living conditions, task shifting, compulsory services, and training interventions.

4.6. Data collection methods

4.6.1. Interviews

Structured interviews are considered appropriate for testing specific hypotheses or gathering specific data (Aberbach and Rockman, 2002). In contrast, unstructured interviews can be completely driven by the respondent (Dexter, 2006). Neither is completely appropriate for this research, so the researcher has decided to conduct semi-structured interviews, to give the interviewees the chance to articulate their own responses, and to ensure that he could explore unanticipated themes. Semi-structured qualitative interviews with policy makers have been shown to provide researchers with a better understanding of policy makers’ beliefs and fuller explanations of their stated strategies. They also allow researchers to explore the perceptions and opinions of the
respondents regarding complex issues, providing more information for subsequent analysis and better clarification (Barriball and While, 1994).

4.6.2. Telephone interviews

According to Carr and Worth (2011) the telephone interview is a strategy of interpersonal communication to obtain important data without the need for a face-to-face meeting. Telephone interviews are considered a legitimate and powerful data collection method (Marcus and Crane, 1986; Sturges and Hanrahan, 2004). The similarities between telephone and face-to-face interviews are that both have a high response rate and both are associated with potential risks such as conflict, anger and misunderstandings (Sturges and Hanrahan, 2004). However, misunderstanding can be corrected during the conversation.

In the US, telephone interviews are used more than in any other country (Carr and Worth, 2001). This may be for geographical reasons (Musselwhite et al., 2007). One of the advantages of telephone interviews is that they are usually cheaper and quicker to conduct, as they overcome geographical boundaries (Holbrook et al., 2003). They are also considered safer; in that the researcher is at a distance from any unexpected reactions that may occur due to the questions he/she asks (Sturges and Hanrahan, 2004).

According to Aquilino (1991) telephone surveys require fewer personnel, and no need for travel, so they reduce time, cost and stress, and are a speedier means of data collection. This argument is strengthened by the findings of research which show that telephone interviews cost between one-third and one-half as much as face-to-face settings (Aquilino, 1991). Aquilino (1991) also states that it is cheaper than face-to-face interviews and telephone respondents were more likely to give socially desirable responses across a range of indicators.

On the other hand, researchers using telephone interviews may have difficulty establishing a rapport with the interviewee, may receive shorter responses to questions than they would in face-to-face interviews, and the inability to see the researcher may cause nervousness in some circumstances (Aquilino, 1991, Holbrook et al., 2003).
face-to-face interview, meanwhile, gives the interviewer the chance to frequently re-shape the interaction to his needs and interests, through visual signals that cannot be used in telephone interviews (Sturges and Hanrahan, 2004). Others comment that face-to-face interviews are generally regarded as a much-valued method of data collection and have a somewhat higher response rate than telephone interviews (Fournier and Kovess, 1993). Aquilino (1991) states that response rate differences between telephone and face-to-face interviews are well documented in surveys, with telephone rates typically 5 to 15 points lower than face-to-face rates. In telephone interviews the interviewee may need some time to prepare his environment in order to be comfortable throughout the interview (Fenig et al., 1993).

It is more difficult to interrupt in a telephone interview, while this is very easy to do in a face-to-face interview (Groves, 1990). Often, expressions can be misheard. In a face-to-face setting, all questions tend to be answered, while in telephone interviews the respondent may ignore some questions (Holbrook et al., 2003). The lack of visual communication prevents interruptions other than spoken ones (Musselwhite et al., 2007). In this research face to face interviews were carried out; however, telephone interviews were also carried out when the researcher failed to approach the respondents directly. Accordingly, forty one interviews were conducted with four of them telephone interviews. The main challenges that faced the researcher during the telephone interviews include receiving shorter responses compared to those received through face to face ones. Also the researcher was unable to transcribe all parts of the conducted telephone interviews as he did with face to face ones. However, using telephones enables the researcher to approach some respondents who are not directly approachable.

4.7. Ethical considerations

Ethical issues need to be considered throughout the research process: when planning research, when collecting and analysing data and when disseminating the results (Flick, 2009). Ethical issues are clearer in qualitative than survey-based research because the former involves interaction with people. Thus, awareness of ethical issues is required in order to avoid harming the participants (Mauthner et al., 2002). Thus the researcher has to inform the respondents that they are taking part in a research study. Also the respondents should be informed of the purposes of the research, and what the researcher
aims to do with the collected data (Gummesson, 2000). Informed consent needs to be obtained and all the information should be treated with respect to the confidentiality principle.

Also, the anonymity of the individuals who take part, and their positions in the health services need to be protected through the use of pseudonyms. Researchers should try not to report any private data that identifies the participant or any sensitive information such as certain performances or practices, illegal conduct, information that could damage an individual’s employability or reputation, medical records that could lead to discrimination, or any information about an individual’s mental health. When analysing my findings, researchers should try to ensure there is integrity in the analysis. Researchers should also avoid any subjective interpretations of the data and try to remain independent when dealing with issues that include conflicts of interest (Cooper et al., 2003).

4.8. The field work

Forty-one interviews have been conducted in Sudan with health system managers at the federal and state levels, health workers, and other actors such as compulsory service officials who have roles relevant to the health sector. Given that the study is based on analytical rather than statistical generalizability, the interviewees were selected purposely with respect to their roles in order to refine the CMOCs related to the staffing of rural areas so as to improve maternal health. Most of these interviews lasted between 40 and 50 minutes. The researcher decided to stop conducting more interviews when the saturation point had been reached and new themes were no longer emerging.

At the Federal Ministry of Health (FMOH), the researcher has interviewed the Directors of Primary Health Care and Reproductive Health, the Deputy Manager of Human Resources who also works as a manager at the Academy of Health Sciences (AHS), and the Director of the Public Health Institute which is the research body of the FMOH. At the NHIF, the researcher has conducted three interviews, with the Director General of the NHIF, the Director of Health Services and the person responsible for equipping and supplying NHIF facilities. Also, a medical doctor who had previously worked in rural areas in different states was interviewed to obtain his views and hear of his experiences with rural areas and communities. After building up a picture of what is going on at the
federal level, the researcher decided to continue the investigation by conducting interviews with key informants from different states, selected from the southern, eastern, northern and western parts of the country (see the map of Sudan which shows Sudanese states in section 3.1).

In the Blue Nile state, which is located in the southern part of the country, the researcher has interviewed the Directors of Primary Healthcare and Reproductive Health from the State Ministry of Health (SMOH), the former director of the Ministry of Health, and currently director of the nursing school at the Blue Nile University, about his previous experiences, a female medical doctor who had chosen to work in the Blue Nile state about what motivated her decision, and the Director of Health Insurance for the state regarding the role of health insurance in retaining maternal health workers in the state. At the AHS, the researcher interviewed the deputy manager of the academy and three trainees: a VMW who was undertaking an upgrading course so as to qualify as an AHV, a trainee from a remote rural village who was hoping to qualify as a technical midwife (TMW), and an illiterate trainee from a rural area who was hoping to graduate as a VMW. Also, a group interview was conducted with medical doctors who, as part of their jobs, travelled to rural areas in the state.

In the south-eastern state of Sennar, semi-structured interviews were conducted with the Director General of the Ministry of Health, the Director of Health Insurance, a medical doctor who was working at a rural health centre, and a medical doctor who had come to the state through the compulsory service programme. Also, a group of midwives who were working at the health insurance facility were interviewed, including a nurse midwife, a HV and a TMW.

The researcher then travelled to the eastern part of the country and in Kasala state conducted interviews with the Director of the Ministry of Health, the Director of Reproductive Health, and the Director of Health Insurance for the state. A telephone interview was conducted with the coordinator of the medical cadre within the compulsory service programme. In Halfa locality in Kasala state, the researcher interviewed two medical doctors who were working at the health insurance facility and a female doctor who was working at a rural hospital.

In the capital Khartoum the researcher conducted an interview with the coordinator of the medical cadre within the compulsory service programme at the federal level. Then, as five managers of health insurance from Darfur and South Kordofan states were
located in Khartoum the researcher conducted interviews with each of them about the challenge of staffing those states with maternal health workers and the role of health insurance in retaining them. Then, the researcher interviewed the Director of Reproductive Health for South Darfur state by telephone in order to get a better understanding of the challenges of staffing remote rural areas with midwives.

The researcher then decided to travel to one of the northern states, the River Nile state, where the researcher interviewed the Director of the Ministry of Health, the Director of Health Insurance, a senior HV from the reproductive health directorate whose job involved supervising all HVs in the state, the Director of Academic Affairs at the AHS, along with a senior health visitor from that institution who is working as lecturer. Those respondents were chosen because they were expected to be aware of all issues relating to maternal health workers. The overall classification of the respondents is shown in the table below.

It is worth mentioning that the researcher has also been able to obtain many documents that support the interview findings; these documents include recent annual reports, PowerPoint presentations, and maternal death reviews. This is in addition to other relevant reports about the Sudanese health sector that have been published by international organisations such as the WHO and UN agencies such as UNFPA.

**Table 4 classification of the respondents**

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of interviewees</th>
<th>Gender</th>
<th>profession</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers at federal level</td>
<td>8</td>
<td>Males: 6 F: 2</td>
<td>Doctors: 6</td>
<td>One of them is a compulsory service manager at federal level</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lab technician: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Administrative staff: 1</td>
<td></td>
</tr>
<tr>
<td>Managers at underserved states</td>
<td>23</td>
<td>Males: 19 F: 4</td>
<td>Doctors: 17</td>
<td>One of them is a compulsory service manager at state level</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Obstetricians: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pharmacists: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Health Visitors: 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nurse: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Administrative staff: 1</td>
<td></td>
</tr>
<tr>
<td>Medical doctors</td>
<td>9</td>
<td>Males: 7</td>
<td>Doctors</td>
<td>Five of them</td>
</tr>
</tbody>
</table>
Females: 2
were interviewed in two groups.

<table>
<thead>
<tr>
<th>Midwifery cadre</th>
<th>Males: 0</th>
<th>Health Visitors: 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females: 6</td>
<td>Nurse Midwives: 1</td>
<td></td>
</tr>
<tr>
<td>Technical Midwives: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Midwifery trainees: 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Of them three were interviewed as a group

<table>
<thead>
<tr>
<th>Total number of respondents</th>
<th>Males: 32</th>
<th>Different professions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females: 14</td>
<td>41 interviews</td>
<td></td>
</tr>
</tbody>
</table>

4.9. Strengths and weaknesses

The respondents - whether they are health managers or front liners - are aware of the challenge which faces rural health. As most of the interviewed health managers have previously worked as front liners in different states, this enables them to provide valuable information about the staffing of rural areas with health workers and to provide richness to the CMOCs. The researcher noticed that some respondents are more useful than others, while some are very open and always give examples from the real world. Others are not as open; they just tried to briefly answer the questions. Other problems included that some respondents tried to impose issues irrelevant to the research and it took time to put them back on the right track.

Reliability and accuracy of information have been maintained by asking the same question to different respondents from different states and at different levels, and by targeting respondents from different administrations at the federal level. The respondents are drawn from different public sector organisations responsible for providing maternal health services to Sudanese communities.

The privacy and confidentiality of the respondents was respected, in that they were given the right to withdraw at any time and to refuse to answer any question. However, this did not happen in practice. The respondents were informed that they were taking part in a research study. The researcher told them who he was, the purposes of his
research, and what he aimed to do with the data he will collect. Then, the researcher obtained their informed consent and assured them that he would treat all of the information provided as confidential. Permission for audio recording was obtained before commencing the interviews. Apart from four telephone interviews and another two face-to-face interviews, all of the interviews were recorded. Notes were taken during the unrecorded interviews and the main findings summarised.

Integrity has been maintained in analysing the findings, in that the researcher has avoided making subjective interpretations of the data and tried to remain independent when dealing with issues that include conflicts of interest. The use of digital voice recorders provided a high quality of audio and flexibility in terms of transferring data from the digital recorder to memory sticks and then to computers and laptops. In the first few interviews, the researcher attempted to focus on the interview guide. However, after conducting several interviews, he became aware of key findings related to the maternal health workforce in different states. Then, he started to investigate the emerging themes and patterns in addition to the original focus.

The interviews were conducted in Arabic and the findings including some quotes were written in English. The author always tried to sustain accurate translation, however some translated quotes may not represent the exact words as said by the respondents instead just the overall meaning. As a result, for time reasons, the researcher was not able to travel to the Darfur states. However, as mentioned above, he was able to interview some directors of the health insurance fund for Darfur when he was in Khartoum. Also, in some states he was unable to locate the targeted interviewee and in such cases he did his best to find an appropriate substitute.

4.10. Conclusion

In this chapter the researcher has written about the chosen methodology, data collection methods and data analysis tools. Realist evaluation holds distinctive features in enabling researchers to explore and explain in detail what works, what doesn’t, how and under what circumstances. The researcher has outlined the key concepts and the main principles related to the realist evaluation. In addition to that the researcher is keen to get his understanding of the method by consulting recent publications by the founder of
the method. This enables the researcher to properly construct the CMOCs to be tested through semi-structured interviews with health managers and the front liners in Sudan. The CMOCs based interview guide was developed with respect to the developed CMOCs. The main objective of this guide is to facilitate the collection of data about contexts, mechanisms and outcomes and testing and refining of the CMOCs. The next section will be assigned to the main findings of this study. These findings will be presented with respect to the initial CMOCs, which have been developed, from the literature review and the documentary analysis.
Chapter five: The main findings

5.1. Introduction

The most appropriate analytic technique for this research is thematic analysis with respect to the CMOCs and the preliminary theoretical framework. I will try to clarify the context, mechanism and outcome patterns of each intervention related to staffing remote rural areas with maternal health workers. Accordingly the researcher will put relevant CMOCs coming from the literature review and the policy documents before refining every theme. CMOCs coming out from the empirical fieldwork will be placed at the end of these themes. Hence the findings will be presented with respect to the initial framework in order to refine the CMOCs by shedding light on what works, what does not, for whom and under what circumstances. These findings are related to distribution and deployment mechanisms, financial aspects, living and working conditions, task shifting and training interventions.

5.2. Findings related to deployment and distribution mechanisms

In this section the researcher will shed light on the deployment mechanisms related to staffing remote rural areas with maternal health workers in Sudan. These interventions include the deployment mechanisms related to medical doctors and midwifery related mechanisms. Table 5 presents the CMOCs related to this theme from the literature review and the policy documents.

Table 5 CMOCs related to deployment mechanisms from the literature and the policy documents

<table>
<thead>
<tr>
<th>Context</th>
<th>Mechanism</th>
<th>Outcome</th>
</tr>
</thead>
</table>
| Health workers do not like to go to rural areas | *Compulsory service  
*Rotation of medical doctors between areas  
*Local recruitment | *Improve the presence of health workers in rural areas.  
*Improve access to maternal health services in rural areas. |
5.2.1. Deployment mechanism related to the medical doctors

In the past, there was a central rotation policy for doctors. This policy, which the majority of the interviewees described as the “best policy”, operated until 1994 when the government adopted federalism. According to the rules of federalism, the recruitment of health workers has been delegated to the state governments; as a result, the rotation system has been cancelled and each state is now responsible for recruiting its own civil workforce, including health workers. Now, doctors are allowed to choose between states offering them permanent jobs. Doctors who accept a permanent position in a state have to stay for at least two years before they are allowed to move to another state.

“The policy makers should reconsider decentralisation because it has a negative impact on the recruitment of medical doctors. For example, if you ask me to go and work in Darfur for a specific period of time after which you will transfer me to a central state, I may accept this offer, but I will not go to stay in Darfur forever because I’ve got to look out for my career advancement and personal development, and also the education of my children is very important. We have raised these suggestions to the Council of Ministers for consideration in the new constitution that is currently under preparation” (Health manager from federal level, 1).

Moreover, there is no enforcement mechanism moving specialists from the capital of the state to other underserved areas, apart from working as a visiting consultant for an agreed short period of time. This visiting consultant initiative will be further elaborated in the next sections.

Due to the lack of an effective central body, instead of attracting doctors from the capital Khartoum to underserved states, doctors may be attracted from one underserved state to another one due to cash difference.

“We have examples of surgeons who receive 1000 pounds from the state government; this doctor has been attracted to southern Kordofan by 5000 pounds”. (Health manager from the state level, 13)

Thus, the central rotation system was strongly recommended by most of the interviewees, particularly doctors and specialists.
A. Compulsory service

The compulsory service programme transfers new doctors to underserved areas upon completion of their “houseman” training which is a training programme organised by the Ministry of Health for newly graduated medical students as part of the requirements for medical practice. According to the compulsory service rules, the more remote the area to which you go, the shorter the period you have to stay there. This programme, which started in 1997, has helped to recruit doctors to very remote areas, some of which received doctors for the first time as a result of it. Medical doctors deployed to the underserved states through compulsory services will also enjoy financial incentives by health sector organisations. For example, NHIF pays up to 1500 SDG which is equivalent to ($300) for each medical doctor; the payments varying according to the remoteness of the area, subject to the opinion of the health insurance managers of the states in question.

For the doctors interviewed in this study, these financial incentives seemed to be the main reason they had chosen to go to remote states. Others said that both the financial incentives and the shorter period of service required in more remote locations were factors.

“I’ve chosen to serve the compulsory period in this state to save time and to have more money” (Medical doctor, 3).

Some of the interviewees commented that the compulsory service programme is a very useful and practical solution for staffing remote rural areas with medical doctors.

However, there are concerns, mainly about the high turnover of doctors who go to remote states through this programme. The majority of them tend to go back to Khartoum to complete their education, or sometimes emigrate from the country for financial reasons. Also, welfare doctors always prefer to work in either the capital Khartoum or in Madani which is another central city in Sudan with a good infrastructure. These doctors feel they can accelerate their career and professional development by utilising the learning facilities that are available in these cities, not to mention the availability of highly reputable trainers in most medical specialities and sub-specialities in Khartoum and Madani.
Some of the respondents stated that many doctors did not have the experience to work alone in a remote rural hospital. Some health system managers would ensure that doctors first acquired the basic skills in the main specialities, such as maternal and child health, surgery, and medicine, but in some states doctors would be sent directly to rural hospitals with no further training.

Other participants raised the issue of the challenge of replacing the compulsory service doctors, claiming that it was a real challenge for the health policy managers of these states to manage the doctors and successfully replace them. As one of the health system managers said, “It is not a sustainable mechanism for staffing underserved areas” (Health manager from federal level, 2). Other concerns include female doctors’ lack of compliance with the compulsory service programme. Given that women now represent the majority of graduating doctors and students in the medical schools, this is potentially a serious problem. Female doctors almost always prefer to spend the compulsory service period either in the capital Khartoum or in health facilities close to their families. Most of the female doctors who are practising in remote states are either originally from that state or went to it with their husbands. The compulsory service officials are very flexible in deploying female doctors; “we always deploy female doctors with respect to their conditions and families” (Health manager from state level, 9).

Female doctors, including those who have to comply with the compulsory service programme, have started to go to the underserved states since suitable accommodation protected by security guards has been built for them.

“Since we built the accommodation camps for female doctors, they have started to come to our state regularly because they feel that they are safe here” (Health manager from underserved states, 1).

Another health system manager stated, “These camps are provided with electricity, telephone and internet services, hence we expect the number of female doctors to increase year by year” (Health manager from underserved states, 2).

In some states such as the Blue Nile state, these camps are also provided with food to encourage female doctors to stay longer. One of the health system managers at the federal level suggested that two doctors should be recruited to each rural hospital rather than one in order to reduce their stress and sense of isolation, and enable them to help
each other. He also recommended that the compulsory service programme should set
annual targets and coordinate its activities with the health authorities in the states so as
to sustain the supply of doctors to these underserved states.

B. Deploying doctors for short period of time known as Visiting Consultant Initiative

This initiative is organised by NHIF for the insured population in underserved states.
The main objective of this initiative is to minimize the cost of the provided healthcare
services for the insured, treat complicated cases there, and provide outreach support for
health workers at targeted underserved areas.

This initiative is implemented in two ways. The first method is deploying some
consultants from Khartoum to the capitals of the underserved states for sub specialities
such as cardiology, neurology i.e. it is only for speciality which is not available in the
targeted state. The advantage of this initiative is that it will minimize the cost.

“If we didn’t do that the patient should have to pay a lot of money to travel to
Khartoum particularly if he/she needs a carer to accompany him/her, in these cases the
patient needs to pay the cost of travel for that carer” (Health manager from federal
level, 2).

A health manager from NHIF headquarters provides further explanation:

“We focus on specialities which do not exist in the states such as cardiology, heart,
urinary tract and nerves. The advantage of this initiative is reducing the cost for the
patients” (Health manager from federal level, 3).

The respondents from NHIF believe that this initiative has helped in reducing the
number of patients who intend to travel to Khartoum to consult specialists. The other
form of this initiative is transferring specialists from the capitals of the states to other
underserved areas with no specialists. In this case a group of specialists will go from the
capitals of the states to provide their services for these rural areas. For instance,
obstetricians tend to take diagnostic equipment such as portable ultrasound to provide
diagnostic services for the rural pregnant women.

“We always have portable ultrasound, it is very important to identify the women who
are expected to have problems with vaginal delivery in order to transfer them to upper
levels” (Health manager from federal level, 3).
Complicated cases that are likely to have obstetric labour are transferred to upper levels to receive appropriate healthcare services. One of the health managers states that “we have discovered that a rural woman is pregnant with two twins in southern Kordofan state, we transfer her immediately to the capital Khartoum, and she safely delivers her four babies” (Health manager from federal level, 2).

These services are provided for the insured and non-insured; however the non-insured have to pay for the medicines unless other partners agree to pay for them. One of the states active in those programmes is North Kordufan state; however, Darfur states and southern Kordofan always have security problems. This initiative could be considered also as outreach support for rural health workers. Apart from provision of specific health services technical support is also provided during these visits.

“We may train some medical assistants on how to perform minor operations. The consultants also may provide lectures to medical students; this has happened in the Red Sea state” (Health Manager from federal level, 5).

5.2.2. Deployment mechanism related to midwives

The experience of Sudan shows that midwives who are recruited from remote underserved areas into midwifery training programmes are more likely to go back and serve their rural communities than other health workers such as doctors. This success happens because the recruited midwifery trainee should accept the terms and conditions of midwifery schools, which include commitment to go back and serve their own villages upon completion of the training programme. These midwives have no option like doctors who can work in the capital Khartoum or even migrate outside the country. One of the health managers at state level reflects on this reality:

“We have 565 midwives…they are well distributed apart from some isolated village which are still reluctant to bring their daughters to be trained as midwives” (Health manager from state level, 18).

According to the decentralisation measures, lower level health workers are managed, recruited and deployed by states authorities. This enables effective deployment of those health workers to their rural communities. It is clear that the vast majority of them go back to their own villages. A small number may not do so due to a lack of enforcement
mechanisms; however, even among those the majority tend to serve the same locality or stay within the same state. In some villages there is sufficient number of midwives, resulting in competition between them. As a result, those who are not employed by the state and fail to compete may change professions, working as tea sellers for example. Due to the instability in the Darfur region, some trained midwives have left their villages for the temporary camps designed for the displaced as a result of the on-going conflict in the region. This is the case not only in South Darfur but also in other Darfur states.

In this section the researcher refined the CMOCs related to the deployment mechanism. These include findings related to the compulsory service as a mechanism for deploying newly graduated doctors to the underserved states. It also includes the deployment mechanisms related to the midwives. The presented finding in this section also has shown other CMOCs which have come out from the empirical field work (see table 6).

**Table 6 CMOCs related to deployment mechanisms from the empirical field work**

<table>
<thead>
<tr>
<th>Context</th>
<th>Mechanism</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialists don’t like to stay in rural areas for a long time</td>
<td>Deploy them for short period of time</td>
<td>Specialists provide their services in underserved areas for a short period of time</td>
</tr>
<tr>
<td>Midwives don’t like to work away from their home villages</td>
<td>Selecting midwifery trainees from underserved villages with condition that they have to work there</td>
<td>Midwifery trainees provide their services in the targeted villages</td>
</tr>
</tbody>
</table>

**5.3. Findings related to financial incentives**

In this section the researcher will shed light on the financial interventions related to staffing remote rural areas with maternal health workers in Sudan. These interventions include the financial mechanisms related to medical doctors and midwifery related mechanisms. Table 7 present the CMOCs related to this theme from the literature review and the policy documents.
Table 7 CMOCs related to the financial incentives from the literature and the policy documents

<table>
<thead>
<tr>
<th>Context</th>
<th>Mechanism</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Health workers do not like to stay in rural areas.</td>
<td>* Financial incentives</td>
<td>*Improve their satisfaction</td>
</tr>
<tr>
<td>*Doctors do not like to go to rural areas</td>
<td></td>
<td>*Encourage them to stay longer and reduce their turnover</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*Improve the presence of doctors in rural areas.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*Improve access to maternal health services in rural areas</td>
</tr>
<tr>
<td>Village midwives (VMWs) who have no salary may stop practising and leave the rural areas</td>
<td>*Incentives *Recruitment</td>
<td>*Encourage them to stay in the rural areas and keep providing their services</td>
</tr>
<tr>
<td>*Midwives who could not be considered as skilled birth attendants (SBAs)</td>
<td>*Training programmes *In-service training *Upgrading of current midwifery workforce</td>
<td>*Improve their skills and knowledge *Competent midwifery workforce in rural areas who are able to provide home deliveries *Improve access to maternal health services *Midwives become able to manage obstetric complications</td>
</tr>
<tr>
<td>*The majority of rural women prefer home deliveries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most rural hospitals have no obstetricians</td>
<td>*Training programme for general doctors in EmOC</td>
<td>*Fill the gap *Improve their knowledge and skills.</td>
</tr>
</tbody>
</table>
5.3.1. Medical doctors

Payment mechanisms for medical staff are different from one health facility to another according to its affiliation to ministry of health or to NHIF. Doctors who work at health facilities which belong to the ministry of health enjoy a percentage of the income of these health facilities. The income of public health facilities comes from two main sources. The first source is the fees for service paid by non-insured as out of pocket payments. The second source is the payment from NHIF on behalf of the insured who receive their healthcare services at these health facilities.

On the other hand, the doctors who work at health insurance health facilities receive regular payments from the NHIF. NHIF pays up to 1500 Sudanese pounds (SDG) ($300) for each medical doctor who works at NHIF health facilities. These top-up payments vary according to the remoteness of the area, subject to the assessment of the NHIF managers in the states. There is collaboration between the ministry of health and the NHIF in retaining highly skilled personnel in underserved states. For example, in the Blue Nile state the NHIF and the ministry of health pays regular monthly incentives to all consultants working in the states as a retention incentive, regardless of whether they are providing healthcare services to the insured or not. According to an agreement between state ministry of health (SMOH) and the NHIF, every consultant receives 1000 SDG ($200) monthly from the NHIF in addition to other regular incentives paid by the state government on behalf of the SMOH. Also in the Blue Nile state both the Ministry of Health and the health insurance fund subsidise the living costs of medical doctors who live in doctors’ camps. This form of financial incentive includes provision of food supplies to accommodation camps at underserved states. These efforts have positive impacts and are really appreciated by the interviewed front liners.

“We subsidise the doctors’ camps with food and other nutritional materials, we feel that these efforts are appreciated by those doctors and help in improving retention rates and reducing the turn over” (Health manager from the state level, 9).

“I am really impressed by the incentives and subsidies provided to us, when my colleagues phone me I start to encourage them to come to the Blue Nile state” (Medical doctor, 3).

The role of anaesthetists is considered to be the most important speciality in underserved states with lesser opportunity to run private clinics like other specialists,
hence a higher incentive paid for them in order to retain them there. For example, in Darfur states each anaesthetist receives 5000 SDG ($1000) monthly from health sector organisations. Conversely, there are obstetricians whose shortage is not the same as other specialties in remote and underserved states because of the income they receive from their private clinics.

As a result it becomes the most desirable specialty for newly graduated doctors. This finding is supported by figures obtained from The Annual Health Statistical Report (2011) which shows the obstetrics registrars representing number one in the Medical Specialisation Board. A manager at the federal level stated, “The most desirable specialty in the Sudanese Medical Specialisation Board is Obstetrics. Financial reasons could be behind this trend, in that the obstetrician profession is considered one of the most profitable professions in the country” (Health manager from federal level, 4).

The availability of private practice is always an issue, in that if there is a possibility of running a private practice, then rural areas will become more attractive to medical doctors. However, there are many complaints about these private clinics and some respondents report that many doctors sometimes go to their private clinics between 12-1 pm given that they have to stay at hospitals till 4 pm. When the researcher discussed this issue a health manager, stated that:

“We know that it is not acceptable, but if we punish them they may decide to leave our state” (Health Manager from underserved state, 7).

The earnings from the private clinic could help the doctors to increase the low income received from public salaries. However, the specialists who already run a profitable private clinic in urban areas are always reluctant to go to rural areas because of losing the opportunity to make money from their private clinics in urban areas. These specialists are always popular and the public always seek to consult them.

Other problems associated with financial aspects are the migration of doctors to high income countries particularly in recent years. A manager from one underserved state explained that:

“Since 2010 we have lost 33 doctors from the state, they have gone to Saudi Arabia to receive about 10 000 pounds”.
This is one of the main problems that faces the attraction and retention of doctors in the country. Deterioration of currency after creation of South Sudan has encouraged many doctors to leave the country.

5.3.2. Midwives

The issue of financial incentives of midwives is different from doctors because there is a difficulty in recruiting them into the civil service system. However, a respectable effort is being made across the states to employ midwives within the civil service system. The number of employed midwives is gradually increasing; in South Darfur state, 400 VMWs have been employed so far and receive monthly salaries from their local authorities. However, some localities have not done so, claiming that their financial situation prevents them from employing midwives. The NHIF also pays incentives to midwives who work in its health facilities. Some NGOs working in the Darfur region also tend to employ VMWs in their own health facilities.

Midwives are often poorly paid because they are recruited to low-scale positions that are equivalent to those of casual workers. Thus their income is mainly dependent on the payments offered by the husbands of the women they treat. The size of these payments depends on different factors, including the income of the treated woman and her husband. Sometimes, the outcome of the delivery may affect the amount of money paid. For instance, if the woman or her baby dies, this may reduce the amount of money paid. In some isolated nomadic pastoral communities, the VMWs will be paid well if they deliver a boy, as these rural populations believe that boys will be more helpful to their families than girls. Some rural communities tend to pay in kind rather than in cash, with midwives often given items such as sugar and soap. However, most midwives, whether employed by the state or not, tend to accept both payments and gifts from the women they treat.

“I have been recruited at the ministry of health and I receive regular salaries. I also receive payments and gifts from the served women and their families. These payments which vary from 50-75 SDG (10-15$) per case were paid on a voluntary basis. I didn’t ask them to pay for me but if they did I will accept that payment. These payments are affected by the economic status of the served family. Some families pay well when the
mother delivers twins or a baby boy but I think this is not fair. The delivery process is the same and the payment should not be affected by the outcome of delivery” (Midwife, 1).

This point was emphasised by one of the health managers at federal level.

“Some families have no ability to pay well for the midwives because of the economic situation” (Health manager from the federal level, 5).

Midwives who have no monthly salaries could receive performance based incentives. These incentives depend on the number of cases treated by those midwives.

“Those who are not recruited receive incentives for each report they provide these reports include ANC, services, deliveries, notification of maternal death” (Health manager from underserved state, 11).

However, even the financial allocations of these sorts of payment are dependent on donations from some NGOs and periodic governmental programmes. Considering the new cadre known as technical midwives or midwifery technicians, no state has been able to employ its few graduated technical midwives (TMWs) so far. In Blue Nile and Darfur states, the TMWs have been deployed to hospitals, where they are only receiving incentives rather than permanent salaries. However, the River Nile state has plans to employ its technical midwifery trainees to fill the shortage of nurse midwives in the main hospitals, as most of the states have a severe shortage of nurse midwives who work at hospitals and big health centres.

5.3.3. The impact of financial incentives

It is clear that the financial incentive has a positive impact on the health workers satisfaction and many health workers have shown that the financial incentives directly lead to improving their satisfaction. The doctors interviewed for this research had chosen to move to remote states and financial incentives appeared to be the main reasons behind their decision. One doctor who worked for many years in Sennar state said that “the doctors always prefer health facilities with good incentives whether the payment is made by a health sector organisation or from private clinic…the doctors who choose to work at small villages’ health facilities with no chance to run private clinics are actually either originally from these villages or couldn’t find another option” (Medical doctor, 2).
Many doctors who have worked in different states have shown that the financial incentives have motivated them to stay longer in the underserved states. A medical doctor who is working at Sennar state explains that “Even though I have finished the compulsory service period, I decided to continue providing health services at Sennar state because I need money” (Medical doctor, 3). Another doctor from a rural health facility in the same state has told the researcher about his friend who decided to stay longer in a remote rural health facility with bad living conditions because of the financial benefits that they earned there. That doctor decided to stay at Alazaza village which is suffering from bad living conditions; for example there is no telephone network and no public electricity in that village. The main motivator for that doctor is that he becomes able to run a profitable private clinic and can earn between 6000 to 9000 SDG (1200-1800$) monthly. This indicates that the financial benefits could outweigh suffering from bad living conditions.

When asked if he thought the medical doctors who work at NHIF health facilities are likely to stay longer than those who work at the ministry of health facilities, this respondent explains:

“Yes we think the health workers who work at health insurance facilities are likely to stay longer because NHIF pay good incentives to these doctors…. We pay up to 3200 SDG for consultants in Darfur states” (Health Manager from federal level, 7).

The midwives and those who receive regular incentives also are considered more enthusiastic in reporting their performance by many respondents. Different health systems managers in different states believe that the paid midwives always perform better than the non-paid ones. As one of the directors of reproductive health in one of the underserved states explains “recruited midwives or those who receive regular incentives are always more enthusiastic in preparing the required data for the information system” (Health manager from underserved state, 5). This indicates that the financial incentives could increase the productivity and efficiency of maternal health providers.

When the midwives are poorly paid, they may try to involve themselves in other activities far from the provision of healthcare. These activities include farming, selling vegetables and fruit. In such cases, when people ask for their help, it may take time for them to switch from their role as farmers and vegetable sellers to their role as maternal health providers. This may result in delays that could lead to the deterioration of the
health of their patients. Due to the severe shortage of obstetricians, health visitors and nurses’ midwives, states ministries of health tend to employ the retirees from these professions. The director of the SMOH from one of the underserved states said:

“We now have contracts with two retired obstetricians who are working in the biggest hospital in the state...we have no option” (Health manager from underserved state, 13).

However this initiative only works with retirees who are originally from the underserved state or have decided to stay in the state. Also, there are difficulties in fulfilling the financial obligations of these contracts, in that the payments are made from the hospitals’ budgets rather than by the Ministry of Finance.

“The rich hospitals are attractive because they can easily pay better incentives than the poor hospitals which rely on fluctuating governmental payments” (Health manager from state level, 13).

5.3.4. Other issues related to financial aspects

There is a remarkable number of women who prefer home delivery including the insured women. Even though the home delivery service is not included in the benefit package of health insurance, if this service is included it could have a real impact in motivating the VMWs through the incentives that could be paid to those midwives when providing maternal health services to the insured women. However, the concerns of health insurance officials is that they believe that those midwives are informal cadre and not recognised even by the government because they have no salary. As one of the managers of health insurance said “how can I rely on cadre which is not recognised even by the government and they are not part of the health system?” (Health manager from underserved state, 6).

Health insurance managers argue that they have many problems with indirect health facilities particularly with reimbursements. If they cannot manage financial problems with formal cadre, how can they manage with informal cadre? However, the officials in FMOH still believe that the NHIF should include the services provided by lower cadre such as the medical assistants, community health workers and VMWs in the benefit package in order to facilitate the financial payments for those health workers. They also say that since the NHIF try to include the informal sector and rural communities, they should include them with the cadre which is available in their areas.
In Khartoum state, a doctor may have to wait many years before being given a permanent post. Some underserved states have started to offer permanent jobs to newly graduated doctors in order to attract them to rural, underserved areas. Some doctors have accepted such offers, particularly those originally from the states in question. However, most tend to refuse such offers as accepting them would minimise their chances of career advancement and such positions fail to provide the experience that can be gained from working in the teaching hospitals in the big cities. Some of the respondents stated that these posts tend to be offered in very poor areas with poor living conditions.

International recruitment in terms of employing foreign doctors to serve in underserved areas was also considered. This happened in the Red Sea state when the specialists refused to move from the capital of the state to other underserved towns inside the state; the state governor hired specialists from neighbouring Egypt to work in these underserved areas. While the Egyptian doctors faced some problems gaining licenses from the Sudanese Medical Council to practise as specialists, the governor was able to sort this issue out with the central medical authorities. Those doctors are now providing their services in many areas in the state.

In this section the researcher has refined the CMOCs related to the financial incentives. These include findings related to doctors and midwives. The presented finding in this section also has shown other CMOCs arising from the empirical field work (see table 8).

**Table 8 CMOCs related to the financial incentives from the empirical field work**

<table>
<thead>
<tr>
<th>Context</th>
<th>Mechanism</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is severe shortage of obstetricians/health visitors/nurse midwives</td>
<td><em>Employing retirees from these professions</em></td>
<td>Retirees continue to provide maternal health services</td>
</tr>
<tr>
<td>Specialist don’t like to work in rural areas</td>
<td>Possibility of running a private clinic</td>
<td>Increase their availability</td>
</tr>
</tbody>
</table>
5.4. Findings related to living conditions and personal support

In this section the researcher will shed light on the interventions related to living conditions and personal support to staff remote rural areas with maternal health workers in Sudan. Table 9 presents the CMOCs related to this theme from the literature review and the policy documents.

Table 9 CMOCs related to living conditions and personal support from the literature and the policy documents

<table>
<thead>
<tr>
<th>Context</th>
<th>Mechanism</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health workers who have children do not like to stay in rural areas</td>
<td>*Providing flexible working hours</td>
<td>Improve their retention and satisfaction, and reduce turnover.</td>
</tr>
<tr>
<td></td>
<td>*Access to child care</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Providing schools for their children</td>
<td></td>
</tr>
<tr>
<td>Health workers do not like to stay in rural areas.</td>
<td>*Appreciation from the community</td>
<td>*Improve their satisfaction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*Encourage them to stay longer and reduce their turnover</td>
</tr>
<tr>
<td>Doctors don’t like to go to rural areas</td>
<td>Compulsory service supported with financial incentive</td>
<td>Improve availability of doctors in rural areas</td>
</tr>
</tbody>
</table>

Most of the respondents have reflected the importance of good living conditions on staffing remote areas and improving maternal health services. Issues like roads, electricity, clean water, and telephone services are considered essential needs for health workers and for better health outcomes. A participant from one of the underserved states explains “If you enjoy working in an area with good living conditions and you enjoy electricity and internet services, then it will become difficult to work in other areas that lack these services. I couldn’t imagine a medical doctor will go to areas lacking these services unless he has planned to run a private clinic there or maybe he has no choice and is being transferred by compulsory service programme” (Medical doctor, 2).

Another medical doctor who decided to leave a specific rural area has justified his choice below:
“I left a rural health facility in the Northern State for many reasons amongst them are lack of electricity in order to sit for the speciality exam. I have chosen New Halfa because there is a permanent supply of electricity” (Medical doctor, 3).

Different participants from different states have reflected the fact that the female doctors started to come to underserved states after building suitable accommodation there. Also the availability of mobile telephone networks has facilitated communication between midwives and women in remote villages. Women can now call the midwife for a consultation or even ask them to assist with the delivery. The time factor is essential for saving mothers’ lives. These mobile phones have also enriched the information system and facilitated supervision by enabling VMWs to send their reports via text message. These mobiles have had a positive impact on both the maternal health staff and the maternal health outcomes.

In contrast, lack of suitable accommodation could negatively affect staffing of rural health facilities as one doctor said that “no female doctor will come to work at Singa within Sennar state simply because there is no comfortable accommodation for them” (Medical doctor, 2). Others have reflected the importance of education of their children as one doctor said “If you ask me to go Darfur for ever I will not go because I have children who need to be well educated and as you know this is not available in Darfur” (Medical doctor, 1). Transport infrastructure has a real impact on staffing rural areas with health workers. One of the participants spoke about a story of a female doctor who left her rural post because she suffers a lot in the rainy season travelling between the village where she works and the capital of the state as a result of unpaved roads.

Considering security concerns, a female medical doctor from the Blue Nile state explains that “the main reason for refusal of most of my colleagues to come and work at Blue Nile state is the security concerns” (Medical doctor, 4). Sometimes, poor living conditions can harm the retention of doctors in underserved areas. For example, the doctors interviewed in Halfa argued that some of their colleagues refused to work at the main hospital because they had learnt of colleagues being attacked the year before by villagers in response to the death of a patient who had died at the hospital. The villagers in question had believed that the doctors had been careless in doing their jobs and in failing to save the life of the patient.

Some respondents believe that the delays in referrals are responsible for many of the maternal deaths that take place. However, unpaved roads, especially in the rainy season,
are considered to be the main cause of this delay. Other reasons include lack of security in states with unrest such as Blue Nile, Southern Kordufan and Darfur states.

“Retention of doctors and specialists in Darfur is always difficult because of security reasons” (Healthy Manager from underserved state, 19).

There is a real problem in terms of utilising female doctors given that they now represent the majority of new graduates from medical schools. The pessimistic picture for the future is that female doctors from big cities represent the majority of trainees within the Medical Specialisation Board. Even if they do not emigrate from Sudan, they are likely to end up working in their home cities, close to their families. Different doctors and midwives have reflected the fact that the family factor has a great influence on the health worker’s decision to stay or leave a specific post. A female doctor who works at one of the rural hospitals said that “I am here because my husband is working here; if he leaves this area I will follow him” (Medical doctor, 4). This indicates that females always prefer to be next to their families.

Appreciation from community is also considered one of the main motivators for different maternal health workers including doctors. A doctor who works at one of the rural health centres explains that the appreciation and cooperation from the local community has encouraged him to stay longer at the health centre where he works “they are very simple, helpful and never create trouble for medical staff instead they always show admiration and respect to the medical staff” (Medical doctor, 2). He also explains that he left Singa within Sennar state because the community there is not showing respect like in his chosen village, instead they tend to create problems for the doctors and cases are being referred to the police office as a result.

Generally, the medical cadres are highly respected throughout the country, including those in the remote and rural areas. In some villages in the River Nile state, rural communities have a habit of refurbishing the medical assistants’ houses, and building and furnishing midwives’ homes. The involvement of community leaders in selecting the midwifery trainees has ensured that the selected trainees conduct themselves well and make the commitment to return to their villages upon graduating. Many of the interviewed midwives have explained that their local community has encouraged them to join the midwifery training. These participants reported that the community leaders visit and support the midwifery trainees. In some areas, the community leader has formed a pressure group to support the recruitment of VMWs.
The interviewed health visitors and midwives have reflected the reality that the midwives are respected by their local communities “The villagers listen to midwives and they tend to obey their orders in relation to ending bad habits” (senior health visitor, 1). This indicates that recognition and appreciation from their communities is a very important motivator for them to continue in the profession, especially for those who work in rural areas.

In this section the researcher has refined the CMOCs related to the living conditions and personal support. These findings have shown the importance of creating an enabling environment in staffing remote rural areas with health workers. The presented findings in this section also have shown other CMOCs arising from the empirical field work (see table 10).

Table 10 CMOCs related to living conditions and personal support from the empirical field work

<table>
<thead>
<tr>
<th>Context</th>
<th>Mechanism</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is an increasing number of women qualifying as doctors</td>
<td>*Improve accommodation</td>
<td>*Women doctors stay in underserved areas</td>
</tr>
</tbody>
</table>

5.5. Findings related to working conditions and professional support

In this section the researcher will shed light on the interventions related to the working conditions and professional support to staff remote rural areas with maternal health workers in Sudan. Table 11 presents the CMOCs related to this theme from the literature review and the policy documents.

Table 11 CMOCs related to working conditions and professional support from the literature and the policy documents

<table>
<thead>
<tr>
<th>Context</th>
<th>Mechanism</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health workers do not like to stay in rural areas with poor</td>
<td>*Availability of schools and qualified teachers.</td>
<td>*Improve staff retention and satisfaction and reduce</td>
</tr>
</tbody>
</table>
| living conditions | * Paved roads.  
* Clean water.  
* Providing electricity, telephone and internet services | turnover.  
* Facilitate provision of health services |
| Health workers do not like to stay in rural areas. | * Appreciation from managers and colleagues | * Improve their satisfaction  
* Encourage them to stay longer and reduce their turnover |
| Health workers/facilities in rural areas with poor working conditions | * Distributing maternal health related medicines, equipment and supplies to rural facilities.  
* Rehabilitation of health facilities and ensuring that they are clean  
* Establishment of referral mechanism (linked supervisor, communication, ambulances, vehicles) | * Improve staff satisfaction  
* Facilitate supervision and on-the-job training.  
* Improve the quality of services.  
* Enhance referral system between rural and upper levels of care. |
| There are remote rural areas without health facilities. | * Provision of mobile clinics  
* Mobile health  
* Establishment of maternity homes in villages and neighbourhoods.  
* Equipment | * Improve the presence of health workers in rural areas.  
* Improve access to maternal health services for the rural nomadic communities.  
* Reduce maternal deaths in nomadic communities  
* Facilitate the provision of antenatal and postnatal care services. |
| Maternal health workforce with poor skills who are working in rural areas | * Supportive supervision | * Improving the satisfaction of the maternal health workforce.  
* Improve their skills and knowledge  
* Encourage them to stay |
Good working conditions have a real impact on maternal health outcomes; they also have a genuine effect on health workers including doctors and midwives. Decent working environments have a real effect in motivating doctors to stay in specific health facilities. In this section refined explanations for interventions and mechanisms related to working conditions will be provided.

5.5.1. Ambulances

Means of transportation for referral units with emergency backup are crucial in dealing with obstructed labour and other complications. Different participants express the importance of ambulances in enhancing the referral system between lower and upper levels of healthcare. While other health system managers including directors of ministries of health and health insurance in different states have shown their frustration due to the severe shortage of ambulances in many places under their managerial zones, the availability of ambulances will remove the stress and increase the confidence of midwives who assist with home deliveries. These midwives know that if something goes wrong the patient can be transferred safely to an emergency obstetric unit within an appropriate amount of time.

Health managers from the NHIF tend to emphasise the role of their organisation in provision of ambulance services in rural health facilities:

“We help in provision of ambulances to many rural hospitals; we serve even non-insured, they just need to pay the fuel cost and financial incentive for the driver”

(Manager from federal level, 4).

Sometimes ambulances may be out of service for up to three months for maintenance and repairs. Many rural hospitals have no substitutes to use during maintenance periods. Due to the absence of ambulances in many remote rural areas, rural populations rely on private vehicles to transport patients to hospital.
“The rural populations may use private vehicles and tractors in the rainy seasons to save the mother’s life” (Medical doctor, 1).

Cost is always an issue in these cases, especially for rural villagers. Moreover, sometimes these vehicles are in a poor condition and unable to move very quickly. This is crucial as time is very important in saving women’s lives particularly in the case of bleeding and obstetric labour.

A medical doctor who works in a rural hospital has told stories of the bad consequences as a result of lack of ambulances. “We tend to transfer all cases with bleeding to Halfa hospital, however in some situations we may have no ambulances; this has resulted in delays that could end with deterioration of the mother’s health” (Medical doctor, 3).

5.5.2. Equipment and supplies

In terms of the equipment and supplies provided to VMWs, it is clear that there are considerable efforts being made towards the provision of equipment in all of the Sudanese states by the Ministry of Health and by NGOs such as UNFPA and JICA. Equipment is provided to the midwives upon their graduation and the replacement of old parts takes place during supervisory visits and sometimes during in-service training, which tends to take place in towns. However, many participants explain that VMWs may buy consumable supplies such as medical gloves from pharmacies, which can be expensive and particularly problematic given their low pay.

Health managers from the NHIF tend to emphasise the role of their organisation in improving the working conditions of health facilities including provision of equipment and supplies:

“There are many areas which haven’t seen any Ultrasound before the introduction of the health insurance scheme. We also provide some health facilities in Gadarif, Darfur and Kordofan with solar energy to save the vaccines, lotions and serums” (Health manager from federal level, 6).

Those respondents believe NHIF facilities are more attractive to the health workers than the ministry of health ones.
“Health workers who work at health insurance facilities are likely to stay longer than those who work at ministry of health ones because NHIF health facilities are well equipped” (Health manager from federal level, 3).

The interviewed participants (whether health system managers or front liners) have clearly reflected the importance of equipment and supplies. One of the health system managers at federal level expressed his views about the impact of equipment on staffing remote areas by saying that “Better equipment will definitely encourage doctors to join underserved states” (Health manager from federal level, 5). A female doctor working in the Blue Nile state said that she had chosen to work at the NHIF health centre because it is well equipped.

Many of the interviewed doctors reflect the importance of medical equipment for the provision of healthcare with good quality and to potentiate the skills of the medical staff as well. A doctor who works at a rural health centre said that “if there are Electrocardiography and ultrasound machines in my health centre and I become able to operate them, this will increase my knowledge and skills and this in turn makes me feel more confident of myself and my capabilities” (Medical doctor, 2).

As stated in the deployment section, obstetricians tend to take portable ultrasounds to provide diagnostic services for the rural pregnant women. These portable ultrasounds are very practical for rural and remote areas which are poorly equipped. It helps in accurate diagnosis of multiple pregnancy cases and other complicated cases that are likely to have obstetric labour.

Another health manager reflected on the usefulness of portable ultrasound in remote isolated areas “The portable ultrasound has helped us in treatment of complicated cases such as multiple pregnancy cases. Also we have discovered many cases of uterine fibroids with pregnancy which may complicate vaginal delivery” (Health manager from federal level, 3).

The interviewed midwives reflect the importance of completeness and sterilisation of the midwife’s bags on performing safer deliveries for both the mothers and midwives. One of the interviewed midwives said “The impact of having a complete bag is very positive for me personally and makes me feel more confident and enables me to perform my tasks perfectly. Complete bag always facilitates safer delivery” (Midwife, 1). Another said “If there is shortage in the bag equipment for example gloves this could
expose the midwife to HIV/AIDS due to lack of protection of the hands against infection transmission” (Group interview with midwifery cadre).

When asked to recommend specific interventions for improving the performance in rural areas, most of the respondents suggested improving working conditions by providing medical equipment and supplies regularly to the rural health facilities. One of the interviewed health visitors expressed the importance of equipment by saying that “the presence of equipment facilitates provision of maternal health services and also makes me feel comfortable” (Group interview with midwifery cadre). Another midwife reflects that she feels satisfied when the babies are delivered safely:

“When I succeed in safely delivering a woman’s baby, I feel satisfied and really motivated” (Midwife, 1).

Many respondents have reflected that lack of equipment has a negative impact on both the healthcare provider and healthcare outcomes. One of the health managers from Sennar state explains that patients could be transferred to Khartoum to do one single test or investigation due to lack of equipment such as computed tomography (CT scan) “last week we transfer one patient to Madani to do a cancer test” (Health manager from underserved state, 3). Another doctor said that “if the health centre is well equipped this will encourage performing well and you will never be frustrated, imagine that if I work in the emergency unit within a hospital with no essential equipment and supplies such as cannula, this will definitely make me work with no motive” (Medical doctor, 2). This doctor provides the story of his colleague who left Sennar state for Khartoum because of bad working conditions. The interviewed doctor explained that his colleague who left the State told him that he couldn’t take the responsibility of patients in the accident and emergency unit that lacks supplies necessary to save the needy patients.

When asked about the importance of the equipment a medical doctor said “Lack of equipment could enforce me to transfer patients to upper levels just for an investigation test. Sometimes the requested investigation could be urgent to save a patient’s life, hence when transferred to do the requested investigation in another place the patient could simply pass away before reaching the destination” (group interview with medical doctors, 1). Also many respondents have highlighted the importance of the availability of blood banks. A female doctor who works at a rural hospital in Kasala state explains that many women with severe bleeding have passed away in front of her eyes as a result of lack of a blood bank.
However, other doctors explain that the shortage of equipment and supplies will not prevent them from doing their best to save the women’s lives:

“I’ve done many caesarean sections with just local anaesthelia rather than comprehensive anaesthesia due to lack of supplies. I’ve done operations for women whose haemoglobin is less than 30% in order to save their lives” (Group interview with medical doctors, 2).

5.5.3. Supervision

There are supervision activities in all states. One of the directors of the state ministry of health explains that:

“We have supervisors for each locality who are responsible for supportive supervision for all midwives at the community level. The supervisory visits are planned every three months. These visits include checking the bags, kits, equipment and supplies of midwives. We also supervise midwifery hospital cadre where we check labour rooms, equipment and supplies” (Health Manager from the state level, 4).

The outcome of supervision includes the equipment of midwives being checked in terms of completeness, cleanliness.

“The outcome of supervision includes checking the equipment to make sure that they are clean, sometimes we found corrupted parts of kits and supplies in midwife’s bag” (Health Manager from the state level, 13).

The outcome of supervision also includes collecting periodical performance reports from the supervised midwives; it also includes checking general performance issues. The supervised midwives tend to feel that they are very important and they feel that they are part of the health system.

“There is regular supervision which includes checking midwifery bags to ensure that they are clean and to complete the shortage of particular parts. The outcome of supervision is to show attention, respect for their role, to ensure that the job has been performed perfectly, and to collect the periodic reports about their performance” (Health Manager from the state level, 13).
Some of the midwives believe that they are informally supervised by their local community, when asked how they give further explanation:

“If I perform well, in assisting mothers' deliveries, they will appreciate that and support me and they continue to call me next time, otherwise they will not” (Midwife, 1)

This form of community feedback may be very important in encouraging the rural midwives to improve their performance in order to keep customers. Supervision is always stated in the midwifery plans; however, its implementation always relies on the availability of financial resources at reproductive health directorates.

“Unfortunately in many states supervisory activities are dependent on donors’ fund, if there is no fund these programmes will be terminated” (Health manager from federal level, 5).

Most of the respondents from reproductive health directorates reported that lack of cars always affects their scheduled visits to rural health centres. Availability of funds coupled with lack or shortage in means of transportation has harshly limited supportive supervision all over the country. In addition to the mentioned factors, supervision in conflict zone states such as Darfur is affected by security problems and instability in most of the rural villages.

5.5.4. Encouragement from colleagues

Encouragement from colleagues has a real effect on the decision of many health workers to work in specific posts. Many medical doctors from different states explain that their decision to come to the underserved state in which they are working is the encouragement of a friend who previously worked in these states. This is the case in Sennar and Blue Nile states. Also a medical doctor in Sennar state said that “I came to this state because my colleague who previously has worked here has encouraged me to come and work in Sennar state” (Medical doctor, 3). A female medical doctor who works at Damazin reflects that her sister has encouraged her to come and work at Blue Nile state even though she is originally from one of the central states. Encouragement also has a positive impact on midwifery trainees. A midwifery trainee said that “our colleagues who graduated last year always visit us and encourage us to be patient” (Midwife, 2).
Collaboration among colleagues has a real impact on better performance outcomes; a female doctor explains “*my interest is in paediatrics and another colleague is interested in surgery so we tend to exchange patients in order to boost our experiences and skills. This has a positive impact on my satisfaction and represents one of my main motivators to stay longer at this health facility*” (Medical doctor, 4). This is in line with the literature of attraction and retention of health workers which revealed that mutual respect among colleagues represents a very important motivator for the health workers to stay in the work place (Willis-Shattuck et al., 2008).

5.5.5. Flexible working hours

Regarding this issue, many doctors expressed that they prefer to work at health centres rather than hospitals to avoid stress which is associated with hospital work. As one doctor said “*the hospitals are always associated with being on call especially at night*” (Medical doctor, 3). These doctors try to utilise their time in preparing for specialisation exams. One explains that “*if you choose to work at hospital you will not be able to read for your professional exams*” (Medical doctor, 4). This indicates that doctors always prefer having a flexible working system that allows them to prepare for their professional exams as doctors are always concerned about their career advancement.

The enabling environment is not only about provision of equipment and supplies but also about provision and availability of assistant staff that are essential to perform the tasks. Different participants have reflected the importance of the anaesthetist especially in performing caesarean section operations. Some respondents said that the caesarean section operations could be transferred to other hospitals due to lack of an anaesthetist. This is the case in Halfa as one medical doctor said that “*we tend to refer our patients due to lack of an anaesthetist in our rural hospital*” (Medical doctor, 3).

5.5.6. Other findings related to working conditions and enabling environment

Other findings related to working conditions include those related to availability of mobile telephone services, which have been provided in remote states since 2000. This service has had a positive impact on facilitating communication amongst healthcare providers at different levels.
“Mobile telephones are being widely used; for example midwives tend to consult the doctors about how to deal with a specific problem, or give detailed information about emergency referred complicated cases to ensure that the referral unit and the appropriate health workers are ready to receive the patient” (Health Manager from state level, 8).

Telehealth in the form of telephone consultation between maternal health providers is also used particularly between midwives and the health visitors. The outcomes of this mechanism include better diagnosis and correct medications being provided to the rural patients. Other outcomes include increasing the knowledge of rural health workers.

“Midwives tend to phone health visitors to ask about technical problems they may face during their job” (Health visitor from state level, 1).

The mobile telephone is also used in notifying health authorities of maternal deaths and filling in the relevant forms.

The availability of mobile telephone networks has facilitated communication between VMWs and women in remote villages. Women can now call the midwife for a consultation or even ask them to assist with the delivery. The time factor is essential for saving mothers’ lives. These mobile phones have also enriched the information system and facilitated supervision by enabling VMWs to send their reports via text messages. These mobiles have had a positive impact on both the maternal health staff and the maternal health outcomes.

There is another initiative which is called mobile clinic initiative. This initiative is based on designing vehicles to provide primary healthcare services including maternal health services for rural populations. This initiative has worked in some states including Khartoum, Gezira, Blue Nile, Kordofan and Darfur. However, the main concerns around this mechanism are the high cost. This high cost has convinced decision makers in the Blue Nile state to use small cars that provide primary health care for rural and nomadic populations. However, again there are concerns around exploitation and misuse of these vehicles.

“We have examples of two vehicles which have been damaged because of abuse and exploitation” (Health manager from underserved state, 11).
In the Darfur states, due to the lack of security, many of these vehicles including ambulances and vaccination cars have been stolen by rebel fighters. Thus, the health system managers decided to stop sending mobile clinics to Darfur.

The interviewed doctors reflect the reality that the insured always have better access to health services than the non-insured. A director of the health centre said that:

“When we asked the insured to do specific laboratory or investigation test they do it immediately while the non-insured always try to delay the process because they may have no money at that time” (Medical doctor, 2).

A female medical doctor working at a Halfa rural hospital stated that:

“The health insurance has encouraged the insured women for early follow-up, before they have the health insurance card they are reluctant to come because they cannot afford to pay for some services such as ultrasound cost …..When the insured women realised that ultrasound and obstetrician consultancy is free, they tend to come regularly” (Medical doctor, 3).

Community involvement has played a positive role in maternal health issues.

“We organise programmes in the capital of the state for the selected community leaders, we provide them with courses/lectures about maternal health. Now those leaders always report and notify us of any maternal deaths that take place in their communities, they also help in referral system particularly in convincing the rural families to refer the complicated cases as early as possible. We keep their telephone numbers, we did not pay them money, sometimes when they report maternal death we may send credit balance to their mobile phones in order to encourage them and to motivate them” (Health manager from underserved state, 4).

Poor health outcomes are not necessarily resulting from poor delivery of healthcare services. Instead it may happen as a result of bad behaviour in rural communities.

“We have problems of early marriage and early pregnancy; we have cases of 13 and 14 year olds that get married. As a result of this we start to receive complicated cases with obstetrics fistula” (Health manager from state level, 12).

A female medical doctor working at a Halfa rural hospital stated that:
“I’ve noticed that most mothers come for follow up from seven months onwards of their pregnancies for antenatal care and some of them came just to know the baby’s gender or to check malaria, we take advantage of this to provide antenatal care for them” (Medical doctor from underserved, state, 2).

Health system managers along with the interviewed front liners in Kasala and Blue Nile agree that most of the cases of mothers with anaemia are always from Hadandawah and Umbararo tribes. These nomadic groups always lack health education and their nutrition behaviours are mainly based on just the milk which results in malnutrition among them.

In this section the researcher refined the CMOCs related to the working conditions and professional support. These findings have shown the importance of creating an enabling environment for health workers. The presented findings in this section also have shown other CMOCs arising from the empirical field work (see table 12).

Table 12 CMOCs related to working conditions and professional support from the empirical field work

<table>
<thead>
<tr>
<th>Context</th>
<th>Mechanism</th>
<th>Outcome</th>
</tr>
</thead>
</table>
| There is an increasing number of women qualifying as doctors | *Working in pairs  
*facilitating collaborative working | *Women doctors stay in underserved areas |
| Female doctors don’t like to go to rural areas | Suitable and secured accommodation | Improve availability of female doctors in rural areas |
| Doctors are hesitating to go to some underserved areas | Encouragement from colleagues who have worked before in these areas | Doctors decided to go to these areas |
| Midwifery trainees may feel depressed during training programme | Encouragement from midwifery graduates | Trainees become motivated and keen to continue their training programme |
| Doctors always concerned about career advancement | Enabling them to read and to be prepared for their exams | Encourage them to stay longer in underserved states |
5.6. Findings related to the task shifting

In this section the researcher will shed light on the interventions related to the task shifting initiative to staff remote rural areas with maternal health workers in Sudan in order to provide maternal health services. Table 13 presents the CMOCs related to this theme from the literature review and the policy documents.

**Table 13 CMOCs related to task shifting from the literature and policy documents**

<table>
<thead>
<tr>
<th>Context</th>
<th>Mechanism</th>
<th>Outcome</th>
</tr>
</thead>
</table>
| Most rural hospitals have no obstetricians | *Training programme for general doctors in EmOC  
*Task shifting                                   | *Fill the gap  
*Improve their knowledge and skills.  |
| Rural areas without doctors                  | Task shifting for medical assistants (nurses who have received an additional two years of training) | *Fill the gap  
*Improve their knowledge and skills          |
| Rural areas without health visitors          | *Training of VMWs in contraceptive distribution  
*Task shifting                                  | *Contraceptives distributed to the targeted women  
*Fill the gap  
*Improve their knowledge and skills          |
| Rural areas without midwives                 | *Training of medical assistants in antenatal care  
*Task shifting                                  | *Fill the gap  
*Improve their knowledge and skills          |
| Rural areas without anaesthetist             | *Training of medical assistants in anaesthesia  
*Task shifting                                  | *Fill the gap  
*Improve their knowledge and skills          |

There is no written and approved policy regarding task shifting; however, there are many practices taking place that could be considered task shifting. For example, the tasks of health visitors (HVs) may be shifted to a new cadre known as assistant health visitors (AHVs). HVs are responsible for supervising the village midwives (VMWs) in
all localities. However, due to a severe shortage of HVs, the health system managers have started to select literate VMWs from the localities and provide them with a one-year programme allowing them to qualify as AHVs. This new cadre of workers will work as substitutes in areas where there are no HVs. Also, the VMWs are distributing contraceptives on behalf of HVs in remote rural villages in various states. These family planning services are being provided in remote rural areas with no HVs or AHVs.

The Nurse Midwives provide midwifery services at hospitals and big medical centres. Due to a shortage of this cadre lower midwifery workers such as village midwives were permitted to provide such services at those health facilities whether affiliated to the ministry of health or NHIF. As one of the managers stated “we also approve VMWs in areas where are no nurse midwives” (Health manager at underserved state, 2).

The shifting of some of the tasks of medical doctors onto medical assistants, who are nurses receiving a further two years of training in medicine, is also being considered. The health system managers believe that the medical assistants could perform many tasks related to maternal health on behalf of the doctor. However, in contrast to the situation in some other African countries such as Mali and Ethiopia, the Sudanese health managers believe that operations such as caesarean sections should only be performed by medical doctors. One of the health managers explained: “We think some of the African countries have authorised lower cadres to perform caesarean sections because they have severe shortages of doctors, which is not the case in Sudan. Yes we have a shortage but not like in those countries” (Health manager from federal level, 4).

NHIF policies used to consider the medical doctor as the front liner to provide healthcare for the insured. However, due to the expansion of health insurance coverage in recent years many segments of the rural population have become insured, given that no medical doctors work in their areas. For this reason the NHIF has recently approved the use of medical assistants as service providers in areas without medical doctors. However medical assistants can’t deal with complicated cases that require surgical operations such caesarean sections. In such circumstances they just transfer these cases to higher levels.

The advantage of using medical assistants is that they exhibit high retention rates in underserved areas, as opposed to doctors who tend to be looking for career advancement and high salaries. According to a minority of the respondents, some rural populations
prefer to consult medical assistants rather than doctors. This could be due to the difference in fees for the non-insured, or because people prefer to consult someone they trust, and they are more likely to trust the medical assistants given the very high reported turnover of medical doctors.

However, there is some concern over the use of medical assistants for the provision of maternal health services. Medical assistants in most states focus on general health services rather than maternal health packages. The reason for this is that they are always supported by either HVs or AHVs who are responsible for providing antenatal care (ANC) for pregnant women. This encourages the medical assistants to focus on other health services. Some people believe that the HVs are more skilled in providing antenatal care than the medical assistants. Many of the participants in this study also explained that the majority of medical assistants are male, while all HVs are female, and rural women always prefer to consult female maternal health professionals.

Most of the states experience a severe shortage of anaesthetists, thus it becomes normal to find only one anaesthetist in the capitals of the states while other hospitals in each underserved state are staffed by technician’s anaesthetists rather than doctor’s anaesthetists. The difference between those two cadres is that anaesthetists are originally medical doctors who specialise in anaesthesia while the technician’s anaesthetists are lower cadre with a university qualification in anaesthesia. However, there are still some rural hospitals with no anaesthetists; in these hospitals the job is either done by general medical doctors or medical assistants who receive additional training in anaesthesia. The later example was successfully implemented at Wager rural hospital in Kasala state.

There are some rural areas without any health workers, thus the health system managers decided to approve the community health worker as a service provider in areas where there are no doctors or medical assistants. All state ministries of health including Khartoum state ministry of health have decided to approve this cadre as a healthcare provider. Many health managers have reflected that the community health worker could recognise the signs of complicated deliveries especially in nomadic and rural communities. Accordingly they can refer, deliver primary treatment, and provide health education.

The manager of the academy of health sciences explains their efforts to scale up some health workers to a university degree to ensure provision of health services with high
quality. These include medical assistants and other medical cadres. These training courses will increase their skills, scope of practice and could facilitate shifting some tasks for these health workers. However, there are concerns that task shifting may cause contradictions and overlapping among professions. Some policy makers believe that this initiative could lead to conflict amongst professions who are involved in task shifting initiatives. The debates still continue amongst health managers about the quality of healthcare services provided by the lower cadre. However, even if the health services provided by the lower cadre are lower in quality this is not the right comparison; the comparison should be between the outcomes of the healthcare service provided by the lower cadre and when there is no cadre. This point was made clear by one of the directors of FMOH.

“There is some rhetoric saying that how could we rely on health workers who receive only nine months of training. But I will ask those people to choose between leaving these remote rural areas with no cadre or to staff these areas with less trained health workers. Definitely the second option is more rational and more practical. Those people have to understand that there is a difference between theory and practice. Those people believe that it is not acceptable to bring the community health worker a gain while there are many medical schools in the country. Those people have no right to oppose the return of the community health worker because there are many rural populations without any cadre. It is against humanity to leave some segments of the population without any healthcare provider” (Health manager from the federal level, 7).

Thus efforts should be made to convince different health workers about the advantages of task shifting.

In this section the researcher refined the CMOCs related to the task shifting initiatives. The presented findings in this section have also shown other CMOCs arising from the empirical field work (see table 14).
Table 14 CMOCs related to task shifting and from the empirical field work

<table>
<thead>
<tr>
<th>Context</th>
<th>Mechanism</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortage of health visitors</td>
<td>Task shifting for AHVs</td>
<td>Fill the gap</td>
</tr>
<tr>
<td></td>
<td>Shifting some tasks for midwives</td>
<td>Provide the required services</td>
</tr>
<tr>
<td>Shortage of anaesthetists</td>
<td>Training of medical doctors to do the job</td>
<td>Provide the required service</td>
</tr>
<tr>
<td>Doctors don’t like to work in some rural areas. As a result these areas remain with no health cadre</td>
<td>Train and deploy mid-level health workers such as medical assistants and CHW</td>
<td>Mid-level health workers provide healthcare in the targeted areas</td>
</tr>
<tr>
<td>There is a severe shortage of NMWs in some hospitals</td>
<td>Allowing TMWs to fill the gaps</td>
<td>TMWs start to provide their services in hospitals with a shortage of NMWs</td>
</tr>
</tbody>
</table>

5.7. Interventions related to training & educational interventions

In this section the researcher will shed light on the interventions related to training and educational interventions to staff remote rural areas with maternal health workers in Sudan. Table 15 presents the CMOCs related to this theme from the literature review and the policy documents.

Table 15 CMOCs related to training and educational interventions from the literature and policy documents

<table>
<thead>
<tr>
<th>Context</th>
<th>Mechanism</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctors do not like to go to rural areas</td>
<td>*Conditional licence that can only be fulfilled by working in rural areas</td>
<td>*Improve the presence of doctors in rural areas.</td>
</tr>
<tr>
<td></td>
<td>*Rotation of medical doctors between areas</td>
<td>*Improve access to maternal health services in rural areas.</td>
</tr>
<tr>
<td></td>
<td>*Specialised training</td>
<td></td>
</tr>
</tbody>
</table>
opportunities in exchange for working in rural areas

<table>
<thead>
<tr>
<th>Maternal health workforce with poor skills who are working in rural areas</th>
<th>*In-service training</th>
<th>*Improving the satisfaction of the maternal health workforce. *Improve their skills and knowledge *Encourage them to stay *Improve maternal health outcomes *Improve performance and quality of care in rural areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural areas without health visitors</td>
<td>*Training of VMWs in contraceptive distribution</td>
<td>*Contraceptives distributed to the targeted women *Fill the gap *Improve their knowledge and skills</td>
</tr>
<tr>
<td>Rural areas without midwives</td>
<td>*Training of medical assistants in antenatal care</td>
<td>* Fill the gap *Improve their knowledge and skills</td>
</tr>
<tr>
<td>Rural areas without anaesthetists</td>
<td>*Training of medical assistants in anaesthesia</td>
<td>* Fill the gap *Improve their knowledge and skills</td>
</tr>
</tbody>
</table>

5.7.1. Interventions related to basic training

In this section the researcher will provide the findings of the interventions related to basic training. These interventions include findings related to the midwifery training programmes, initiatives related to training and producing multi-purpose cadres. The section also includes information about selecting medical students from rural origin and the impact of medical schools in underserved areas. Finally, the researcher will provide information about the deployment of medical trainees to underserved areas.
A. Midwifery training

The midwifery training strategy was built on the initial idea of achieving one midwife for every 2000 people in Sudan. This was later changed to one midwife for every village or group of villages with a population of at least 1000. The health system managers made this change when they found that the midwifery trainees were not representing all villages. In spite of the change in the management of the midwifery schools from the Reproductive Health Directorate to the Academy of Health Sciences, recent years have witnessed the graduation of a respectable number of village midwives (VMWs) from different states, something that has in turn increased the coverage of midwifery services, especially in remote rural areas.

The main training programmes at the midwifery schools are the VMWs programme; when asked about this trend a health manager at FMOH said “we chose to focus on midwives because around 80% of deliveries took place at home rather than institutions” (Health manager at federal level, 7). Other managers said that it was “because they are likely to work in remote rural areas where most of the maternal deaths occur” (Health manager at federal level, 5). This reflects the fact that most maternal deaths either happen in rural areas or in health facilities for rural women who are in a poor condition because of a delay as a result of the ineffective referral system.

These training programmes cover knowledge of menstrual history in order to enable the VMWs to recognise the signs of pregnancy, especially in remote rural villages where laboratory investigations may not be available. Some midwifery schools suffer from a shortage of teaching staff, and have started to employ temporary staff such as retirees to fill the gap.

In some states, for example Kasala state, a special training programme for traditional birth attendants (TBAs) has been organised. The health system managers believe that TBAs are important in rural communities, where people tend to trust more in their skills than those of other health professionals. Thus, it is very important to train them; one of the interviewee health managers stated “If we choose not to train them they will continue assisting with deliveries anyway. Thus, it is better to train them rather than doing nothing” (Health manager at federal level, 6).

The majority of those TBAs are illiterate; accordingly, the training process is based on initiation and prompting.
“We train them for one year or nine months.... They are very good... most of them are illiterate so we rely on initiation and prompting. This learning process is supervised by the health visitors” (Health manager from state level, 14).

After completing training programmes those TBAs will be called “trained midwives” or “trained TBAs”.

Another initiative in Kasala state includes training VMWs at temporary teaching sites closer to their communities, because some rural communities may refuse to send their daughters far away from their families and villages. The Wager Temporary School in Kasala state, which was established in 2010, is a successful example of such an initiative. The outcomes of these training programmes are not only midwifery skills but also literacy as this enables trainees to better understand the curriculum.

Given that it is difficult to find girls from some remote underserved areas with appropriate qualifications to be enrolled in midwifery schools, the selection criteria may be compromised and some illiterate trainees may be selected for the midwifery programme. Surprisingly, illiteracy has not been an obstacle to the level of skills the trainees can achieve, particularly for the VMW training programme. This finding is supported by statements from the reproductive health directors, academic staff at the Academy of Health Sciences and the trainees themselves.

“We use peer education techniques in order to train the illiterate midwives. This method is based on combining the illiterate trainees with literate ones. It is a very successful experience” (Health manager from federal level, 5).

The reason behind the success of the illiterate women is their strong commitment to the training programme and to the midwifery profession. They believe that this training programme is their chance to legalise their practice and gain a government certificate that will allow them to attend deliveries. Some of these trainees were previously working as TBAs before starting at the midwifery school, and appear to be very interested in gaining new information and skills. Some of the midwifery trainees reflected on their experiences of utilising these training programmes.

“Before I came here I can only read, now after being exposed to literacy courses, I became able to write. I can understand what they taught me..... The trainers and tutors can spend two or three days with me to ensure that I understand everything, all my colleagues who couldn’t read and write have become able to do so” (Midwife, 3).
Most of the interviewed midwives have expressed the importance of personal factors behind their decision to join midwifery training. Most of the interviewed midwives have expressed that decreasing maternal death in their communities is one of their main motivators for joining midwifery schools. A midwife undertaking training in Blue Nile expressed that:

“The maternal death in my village encourages me to join the midwifery training” (Midwife, 3).

Another technical midwifery trainee in Blue Nile stated that:

“Serving my own community is the main motivator; other motivators include self-actualisation by becoming a reputable midwife in my village and local community” (Midwife, 2).

There are also some international organisations that are helping with the training of midwives in some of the states. These organisations include UN agencies such as the United Nations Population Fund (UNFPA) and various non-governmental organisations (NGOs) such as the Japan International Cooperation Agency (JICA). However, these organisations are focussing on the one-year training programme for VMWs rather than the two-year one for TMWs. This indicates that the midwifery schools have utilized the partnerships between the government and these agencies. The community also helps in encouraging trainees to join midwifery schools,

“My community has encouraged me to join the training programme” (Midwife, 2).

The selection criteria for midwifery trainees at midwifery schools include good conduct, not being pregnant or intending to get pregnant during the training period, and a commitment to go back and serve their own villages upon completion of the one-year programme. A midwifery trainee from Blue Nile midwifery school said that “First we have to accept the terms and conditions of the midwifery school” (Midwife, 3). The midwifery teaching staff always prefer young candidates as they are likely to understand more quickly. However, there are concerns that young midwives may follow their husbands when they get married, leaving their villages with no midwife.

Even the selection method for midwifery trainees has contributed positively towards achieving an acceptable coverage of maternal health services, particularly in remote villages. However, in some situations the community leaders tend to nominate trainees
from other villages rather than the targeted ones, and this may have a negative effect on the coverage plans. Some of the respondents reported that sometimes the health teams would fail to find midwifery trainees in specific rural communities because these communities were reluctant to send their daughters outside their villages. These rural communities normally suffer from low literacy rates and their cultural beliefs are against the education of women.

In some cases, there may be two tribes in the same village that do not trust each other and have different cultures. In such cases, each tribe leader will ask for the midwifery training opportunity; in these situations the health system managers may choose two candidates from this village in order to solve the problem.

“We may choose two candidates from the same village in the case of two tribes” (Health manager from state level, 10).

The qualified VMWs are aware of both the direct and indirect reasons for women’s deaths, including obstructed labour and its signs. A midwifery trainee at Blue Nile midwifery school says: “I am very confident that I can know the signs of pregnancy very clearly, I can perform general urine test to check the bile and I can perform the protein in urine test” (Midwife, 3).

Midwifery trainees were provided with free food and free healthcare during their training period. In addition to that they tend to be provided with midwifery bags upon completion of the training programme.

“In the training schools we provide food, shelter, accommodation, health insurance coverage and kits (bags) tend to be distributed after graduation” (Health manager from state level, 9).

These midwives currently provide a variety of maternal health services in their villages, assisting with deliveries whether at their patients’ homes or at health facilities.

One midwife tried to differentiate between the performance of a trained midwife and an untrained one:

“The TBAs sometimes may keep a mother until deterioration of her health, but the trained VMWs didn’t do that” (Group interview with midwives).
Sometimes the midwifery trainees attach with other midwives to attend deliveries and for knowledge transfer. This method was applied in the Blue Nile state.

“Sometimes we tend to attach some of our trainees to other community based midwives for a specific period of time to attend deliveries” (health manager at state level, 10).

Midwives also provide follow-up visits and give advice to pregnant women before and after they give birth. Other services include family planning, health education relevant to maternal health, and sometimes help with the issuing of birth certificates for newborns.

“Our services include telling and helping women to keep gaps between deliveries” (Midwife, 1).

“In addition to delivery and follow-up during pregnancy, I tend to provide counselling services which include asking them to conduct a periodic check. I also tend to double check that they attend ANC services. I tend to ask them to go to the health centres if they did not then my home, otherwise I will choose to go to their homes to provide the required services” (midwife, 1).

The midwives also report maternal deaths to the higher health authorities. In some cases of outbreaks of specific diseases, the health authorities involve them in controlling outbreaks, according to their capabilities. In some villages where there is no medical assistant, midwives can help the wounded:

“In some areas with no other health workers, she may help in providing services such as helping the wounded and injured people and referring them to hospitals if necessary” (Midwife, 1).

In some states, health managers involve the VMWs in the vaccination and immunisation campaigns, especially in remote rural villages. Various states have witnessed a remarkable reduction in maternal deaths; many health system managers strongly believe that the timely, appropriate and well-managed referral of complicated cases by midwives is one of the reasons for this success.

The majority of the respondents believe that these training programmes are one of the main causes behind the reduction of maternal mortality in recent years.
“We believe these VMWs have a real impact in reducing MMR because before them there are no cadre or there are the TBAs who have provided bad services and they are not qualified” (Health manager from state level, 18).

There seemed to be a problem of consistent application of the stated polices amongst the states. While some states try to focus on TMWs others are just focusing on the VMWs programme. As the long run programmes are aimed at producing midwives with high competence, still no appropriate substitute for cadres such as health visitors is ready to fill the gap. Many health managers from different states express their frustration of the severe shortage of health visitors and Nurse Midwives believing that the intake for these training programmes should never stop. Those health managers believe that there is no convincing substitute for these maternal health providers so far.

**B. Producing multipurpose health workers**

The health system managers have started to focus on training and producing lower cadre who are more likely to work in remote rural villages. These multipurpose health workers include medical assistants and community health workers. These efforts include training of these cadres in order to deliver a variety of health services especially in underserved areas. The advantage of creating maternal health workers with fewer qualifications is that these health workers are not in demand in urban areas such as Khartoum. As a result community health was approved as a service provider in areas where there are no doctors or medical assistants as one of the managers of the NHIF at the federal level stated:

“In some remote areas in Darfur we provide healthcare services through the community health workers” (Health manager from federal level, 6).

Even though maternal health services are mainly provided by doctors, health visitors and midwives, they could be partially provided by medical assistants and the community health workers. Most of the lower cadre have nothing to do with migration internally or externally. These health workers are also not in demand by the recipient countries. Other advantages include the cadres being cost and time effective, because they can be produced with lower cost within a short period of time. These interventions are considered to be very practical solutions especially in a low resource country like Sudan.
Some of the medical assistants are providing maternal health services. One of the interviewed doctors explained that he usually receives patients referred by medical assistants who work in small villages around his health centre. He further explains that “they refer complicated cases such as pregnant women with chronic diseases such as hypertension or diabetes”.

C. Selecting medical students from underserved states

This initiative was introduced by the Ministry of Higher Education in 2000 to enable students from underserved states to attend medical schools with lower grades. According to this initiative, the students are expected to go back to their home states upon completion of their university degree. All of the underserved states are utilising their quotas and some of the students are going back and working in their home states. However, some are not, especially in states such as Blue Nile. Reasons include a lack of follow up, and a lack of coordination between the health authorities in the states and the Ministry of Higher Education.

D. Establishment of medical schools in underserved states

The establishment of a number of medical schools in different states has facilitated the attraction of a reasonable number of consultants and other medical doctors to these states. These consultants tend to work as lecturers at these schools and provide health services at the same time. These medical schools have also helped in retention of doctors in these states, in that those medical students become familiar with these states during their study period. When they graduate many of them prefer to work where they have studied. Many interviewed health managers explain that one of the positive outcomes of universities being located outside Khartoum is that they have facilitated the retention of doctors who have studied at these universities.

One of the executive health managers from Sennar state commented that “most of the medical doctors who are currently working in Sennar state are graduates of Sennar University” (Health manager at state level, 7). This is also the case in Darfur and Kasala. All the interviewees from Darfur states told the researcher that the vast majority of medical doctors currently working there were either originally from Darfur or had received their medical education at Alfashir University, which is located in Darfur. One of the health managers in Kasala explained that “the medical doctors who graduated
from the university in Kasala state were also more likely to stay longer in Kasala than others” (Health manager from state level, 8).

E. Deployment of house officers to training sites in underserved states

The Ministry of Health tries to distribute trainee doctors to remote hospitals in underserved states in order to reduce the current imbalance between the states. This initiative applies to the graduates of faculties of medicine before they are recognised as medical doctors, when they are known as “house officers”. Serving in underserved states is one of the requirements of registering as a doctor. The FMOH now controls the distribution of these “house officers”, who are attached to different teaching hospitals in the states that have been accredited by the FMOH as training sites.

In practice, there are many house officers distributed to different hospitals in the states; however, the main concern about this initiative is that the house officers are not as useful as other doctors because they are still trainees, who are unlicensed and not allowed to practise independently. In that, the trainees who have graduated from the medical schools are not considered medical doctors until they pass the Permanent Registration Exam, after which they are eligible to practise the profession independently.

Those house officers should be supervised by consultants; however, due to shortage of doctors in different states; they may be supervised by registrars, who are trainees themselves, rather than by consultants.

F. Deployment of registrars to training sites in underserved states

Another related policy is based on the deployment of registrars, where registrars are medical doctors who are receiving advanced training in a specialist field of medicine in order to become a consultant, including those trainees who want to qualify as obstetricians. According to this policy, the registrars are obliged to serve in rural training centres during their training specialisation period. Those registrars are actually providing health services in different hospitals in the states. Those registrars work at accident and emergency units which receive complicated cases including obstructed labour cases. The respondents from different states have reflected their appreciation on the performance of registrars who believe that they are very useful for these state hospitals. For example the director of ministry of health of the River Nile state
described them as the “back bone” of healthcare in the main hospitals in the state. While participants from conflict zones such as Darfur believe that those registrars always refuse to serve in their areas because of conditions of unrest.

In practice, while this initiative could work for male doctors, there is again an issue with female doctors who always refuse to go to the underserved areas. Other concerns include poor infrastructure in some of the hospitals outside Khartoum. Also, as a result of the migration of senior tutors, the quality of these training programmes may be lower than at Khartoum. In addition to that, some states ministries of health find it difficult to accommodate them and pay regular incentives. “Our problem is providing them with good incentives and to provide suitable accommodation” (Health manager from the state level, 12).

These factors may prevent some registrars from serving in these underserved states particularly female registrars who require suitable and secure accommodation.

5.7.2. Interventions related to in-service training

A. In-service training in emergency obstetric care (EmOC)

This is an in-service training programme designed for doctors working in rural hospitals aimed at improving their skills and confidence when dealing with complications in deliveries. Apart from a small number of obstetricians, most rural hospitals are staffed by medical doctors who are supposed to be trained in EmOC. These courses are implemented by the SMOHs with support from UN agencies such as the UNFPA and NGOs such as JICA. These courses are very important for doctors working at rural hospitals because they are the main healthcare providers at these hospitals and the first point of referral for all emergencies including obstetrical emergencies.

One of the health system managers from the River Nile state reported, “In the last few years we have organised this course for doctors who are supposed to work alone in rural health facilities ...before we send a doctor to a remote health facility we need to ensure that he/she is qualified to deal with emergencies, including EmOC” (Health manager from the state level, 11).
This programme is important because some doctors may miss some practical sessions related to maternal health during their internship training.

“This programme is important because we have doctors who bypass some practical sessions such as caesarean section in their medical internship because at that time they believe that it is not in line with their career pathway plans” (Health manager from federal level, 5).

This training programme is believed to be one of the main reasons behind the reduction of maternal mortality ratio (MMR) in the last ten years. The main result of these EmOC courses for doctors is that they reduce the burden on large educational hospitals due to the reduction of referred cases with obstetric emergency complications. New skills are gained, and as a result the trained doctors become more confident in dealing with EmOC problems. Some respondents commented that this training programme has encouraged trainees to join the obstetrics specialty. Some of these trained doctors have then reassessed their health facilities from a maternal health point of view and started to demand new buildings and new equipment for their rural hospitals. It has also aided the exchange of experiences and strengthened relationships among trainees and trainers, who are obstetricians from teaching hospitals, which has resulted in better communication and the sharing of maternal health information, along with consultation in some cases. This training programme has helped to improve social relationships between the trainees and introduced them to different cultures, traditions and customs.

However, the main challenge is the high turnover of doctors and their migration outside the country. As a health system manager from the River Nile state said, “We trained 50% of the River Nile doctors in EmOC in the past. However, they have left” (Health manager from state level, 12). Another explained, “In the past we didn’t send any medical doctor to a rural health facility unless they had completed the rural hospital course, which includes training in EmOC. This is important because these doctors will work alone and they have to have good skills. However, due to the shortage, and the migration of doctors in recent years, we have now started sending doctors directly to rural areas without putting them through this course first” (Health manager from state level, 11). Some respondents such as a medical doctor from Halfa in Kasala state said that “I’ve heard about this course but no one has invited me to join this course” (Medical doctor, 4).
Another problem is lack of funds which may result in the termination of this important programme. It is very difficult for trainees who are already working at rural hospitals as single doctors to attend these courses as they will be leaving their hospitals without a doctor. As a result, some trainees either only partially attend or fail to attend altogether. Alternatively, some leave their rural hospitals without a medical doctor, which could obviously have a negative impact on the performance of these hospitals. A shortage of cases for practical training has also been reported as one of the factors reducing the usefulness of these courses.

Also the number of women who delivered through caesarean section has increased in many states.

“We noticed that the number of women who delivered with caesarean section is increasing day by day, we don’t know why” (Senior health visitor from the state level, 1).

Many respondents particularly the health visitors are not happy with increased numbers of caesarean deliveries; some of them believe that financial reasons could motivate doctors to undertake caesarean section. The doctors who perform caesarean section receive more than double the money of performing a normal delivery. However, the researcher was unable to identify the actual reason behind this trend.

B. Family medicine initiative

The family medicine initiative, which is supported by the FMOH, is considered a promising initiative for increasing the availability of general practitioners in underserved areas and retaining them for at least two years. This programme is organised in collaboration with Gezira University, and at the end of the programme the medical doctor will graduate with a Master’s degree. The doctor must attend learning sessions at the university at the weekend, and stays at the rural health facility the rest of the time. The advantage of this method is that it makes the provision of healthcare to the rural population part of the doctor’s career. If the trainee has any problems, he/she can talk to a consultant by telephone or another communication tool. Those GPs also receive training in emergency obstetrics care during their training programme to enable them to provide EmOC services in their health facilities.
The doctors prefer this programme because it is free; the states ministries of health pay the tuition fees for the trainees. The graduates of this programme are in high demand in destination countries such as Saudi Arabia and other Gulf countries. This makes it more attractive for those with migration plans. However, the health managers are not concerned by this migration, believing that, even if the trainee doctors decide to migrate, they will still have had the use of their services for at least two years in an underserved health facility.

Gezira state is considered to be a pioneer in the field of family medicine. Khartoum state has started to emulate its efforts and has also made remarkable progress. Some underserved states such as the River Nile and Sennar have just started to adopt the same initiative. However, family medicine is not favoured amongst Sudanese doctors; one of the doctors interviewed said, “if I became a family physician, I would not be satisfied that I was a specialist, I would just think of myself as a well-trained general doctor” (Medical doctor, 1).

As stated earlier, the migration of doctors who gain this speciality is one of the major challenges; one of the health managers at federal level explained that:

“Out of 180 family physicians who graduated from Gezira University now only a few remain in the country” (Health Manager from the federal level, 7).

C. Registrar Zero (R Zero)

This initiative was introduced in 2007; it is based on provision of opportunity for internships in exchange for working in specific remote areas. The selected doctors will be recruited at FMOH. The recruited doctor should pass part one of the agreed medical speciality within a specific period of time then he/she will continue in the job as registrar one. The doctor will be named registrar two when passing part two of the medial specialisation exam. Then the doctor will be recruited as a specialist doctor. The doctor who chooses to join these jobs has to serve in underserved states during and after completion of their speciality for a specific period of time.

However, this initiative appeared to be neither successful nor sustainable and there are a lot of concerns by many participants, whether front liners or health system managers in different states. Deputy Director of human resources management within the FMOH and the director of ministry of health of the River Nile state believe that it is not
sustainable experience. A female doctor who works at Halfa within Kasala state told me that she terminated her registrar zero job because she failed to pass part one of the obstetrics speciality within the specified time. None of the respondents believe that it is a successful initiative.

D. In service training for midwives

In service training programmes tend to be implemented for midwives. Health visitors and assistant health visitors are the health workers who implement this activity. Training sessions might be held for specific periods of time mainly in the capitals of the states or localities. Sometimes UN agencies and NGOs support the implementation of these sessions. Another form of this training programme is a small session during the supervision visits organised by Reproductive Health Directorates in the states. 

“We conduct in-service training for midwives to make them aware of how they can identify the signs which require referral” (Health Visitor, 1).

In this section the researcher refined the CMOCs related to the training and educational interventions. The presented findings have shown the importance of training interventions in staffing remote rural areas with health workers. The presented findings in this section also show other CMOCs arising from the empirical field work (see table 16).

Table 16 CMOCs related to training and educational interventions from the empirical field work

<table>
<thead>
<tr>
<th>Context</th>
<th>Mechanism</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some rural communities</td>
<td>*Training illiterate alongside literate trainees</td>
<td>Trained midwife</td>
</tr>
<tr>
<td>nominate illiterate women for midwifery training programmes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitals in underserved areas are always understaffed</td>
<td>*Deployment of doctors to have part of their internship in underserved states</td>
<td>Those doctors provide their services in underserved states</td>
</tr>
<tr>
<td>Some villagers don’t like their daughter and wives to be trained away from their eyes</td>
<td>Training sites closer to rural communities</td>
<td>Villagers bring their daughter and wives to be trained</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Doctors don’t like to work in some rural areas. As a result these areas remain with no health cadre</td>
<td>Train and deploy mid-level health workers such as medical assistants and CHW</td>
<td>Mid-level health workers provide healthcare in the targeted areas</td>
</tr>
<tr>
<td>There is on-going debate about the competency of VMWs</td>
<td>Extend the period of training programme to be two years</td>
<td>New cadre known as TMWs being produced now</td>
</tr>
<tr>
<td>Some doctors want to be specialists but they couldn’t afford tuition fees</td>
<td>Enrolling them in family medicine programme which includes pay for them with condition of working in rural areas</td>
<td>Doctors provide healthcare services to the rural populations at least during the internship period</td>
</tr>
<tr>
<td>Medical students who undertake their training in urban settings are always hesitating to go to rural areas</td>
<td>Establishing medical schools in underserved areas</td>
<td>Graduates of these schools are more likely to work in underserved areas</td>
</tr>
</tbody>
</table>

5.8. Summary of the findings

In this chapter the researcher has provided refined explanations about the initiatives adopted in Sudan to staff remote underserved areas with maternal health workers. Some of these initiatives are related to doctors while others are targeting midwives. Compulsory service for newly graduated doctors is one of the main initiatives targeting the deployment of doctors to underserved areas. This initiative was supported with financial incentives to encourage doctors to work in underserved states. The building of accommodation camps for female doctors seemed to be a promising strategy and has been implemented in many states in the last few years. Post vocational interventions include family medicine initiatives which have been implemented in many states. Underserved states tend to attract specialists by offering them financial incentives; these incentives are always paid by states ministries of health and the NHIF. The possibility of running a profitable private clinic represents the main motive for many specialists.
including obstetricians to work in underserved states. Initiatives which respect rural origin include recruiting medical students from underserved states and building medical schools in these states. These interventions were built on the assumptions that doctors from rural origin are more likely to work in rural areas than others.

Sudan is committed to achieving the Millennium Development Goals including reducing maternal mortality by 75% by the year 2015. Accordingly, training programmes have been organised in all states to achieve the target of a midwife for every village. Those midwives have played a major role in providing midwifery services in remote rural areas and subsequently helping to reduce maternal deaths. The health system managers have played a major role in recruiting them in public sector jobs; however, a respectable number of those midwives are still not being recruited as governmental employees. Doctors were trained in EmOC to enable them to provide surgical operations related to maternal health. This training programme is believed to be one of the main interventions helping rural doctors to successfully manage obstetric complications.

Deployment of internship periods was also implemented for newly graduated doctors who have been deployed to work at rural hospitals. In addition to that, registrars have to work in underserved areas during their training period. Other interventions include producing multipurpose health workers such as medical assistants and the community health workers. These health workers are expected to provide a primary health care package which may include a maternal health component. In addition to that there are interventions related to creating an enabling environment for provision of maternal health services and for better living and working conditions for the health workforce. The experience of Sudan has revealed many interventions which are not found at all in the literature. The table below summarises these initiatives.
Table 17 Summary of the initiatives adopted in Sudan but not found in the literature

<table>
<thead>
<tr>
<th>Imitative</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time incentive</td>
<td>This incentive is associated with compulsory service intervention. According to this incentive health workers offer to spend shorter time in the less secure or remote underserved states. This initiative has contributed to improving availability of health workers in these areas.</td>
</tr>
<tr>
<td>Training sites closer to rural communities</td>
<td>Some rural communities with high maternal mortality are reluctant to send their wives/sisters/daughters to be trained as midwives in midwifery schools. The health managers tend to use any building close to these communities as a training site. This initiative is considered to be successful in training those midwives who then provide maternal health services to their communities.</td>
</tr>
<tr>
<td>Training of illiterate midwives by attaching them to literate ones</td>
<td>Road maps related to reduction of maternal mortality are targeting recruiting a midwife from each village. However, in some areas health system managers may not find literate ones to be trained. In such situations selection criteria will be compromised and illiterates will be selected. These illiterates will be attached and paired by literate trainees during the training course. This initiative is considered a successful experience.</td>
</tr>
<tr>
<td>Sharing retention incentive by different partners</td>
<td>Some specialities such as anaesthetists are highly demanded by underserved states. Ministry of health and health insurance fund share this cost in order to retain the services. Sometimes other medical specialities are treated in the same way as anaesthetists.</td>
</tr>
<tr>
<td>Visiting Consultant initiative</td>
<td>Specialists don’t like to stay in rural areas for a long time. This initiative is based on deploying consultants to underserved areas for a specific period of time. This initiative is adopted by NHIF;</td>
</tr>
</tbody>
</table>
as a result the specialists provide their services in underserved areas for a short period of time.

| Female doctors accommodation | This initiative was implemented in some underserved states to encourage female doctors to come and stay in these states. Some states provide food in addition to security guards. This initiative has encouraged many females to go and serve in these underserved states. |

In the next chapter these findings will be discussed in the light of the reviewed literature.
Chapter six: Discussion

6.1. Introduction

In this section the researcher will try to reflect on the importance of the findings of this research by linking these findings to the relevant literature. Thematic reflections here are focussed on financial incentives, compulsory service, enabling environment, task shifting, and training and deployment mechanisms.

6.2. Reflection on the financial aspects

Financial incentives include supplementary benefits paid to the maternal health providers to convince them to work or to stay longer in underserved posts. Incentives always aim at achieving a specific change on the individuals’ behaviour (Witter, 2013). The literature shows that the financial incentive has helped the health system in Niger to increase the proportion of medical doctors working in underserved provinces (WHO, 2010). In the Sudanese health system the financial incentives are used to retain maternal health workers in underserved areas. However, insufficient financial allocations from the government to the health sector could hinder the success of the designed incentive package. Financial incentives should be designed to improve the retention of health workers inside the country and in remote underserved areas. The Ghanaian example shows that increasing health worker salaries has contributed to the reduction of migration rates without contributing to achieving a balanced distribution of the health workforce (Adzei and Atinga, 2012; Snow et al., 2011). Financial incentives should focus on retaining health workers in remote rural areas.

Another problem associated with the financial incentives is that the policy makers need to strike a balance between paying sufficient incentives for medical doctors without breaking civil service laws. Overpayment for doctors could be understood by other civil servants as discrimination between public sector servants (see section 2.5.1). This could result in strikes not only from public sector servants outside the health sector but could include other health workers inside the health sector such as dentists, pharmacist, lab technicians and nurses. This is in line with the findings from New Zealand; when the health system managers decided to implement rural allowances for doctors, some other
medical doctors excluded from the rural payments claimed that they should be classified as rural doctors and hence should be paid the new rural allowances (Janes and Dowell, 2004). Thus, fairness rules should be maintained at all times to avoid frustration among healthcare providers. If these health workers feel that they are financially disadvantaged this could increase the rates of frustration among them which could negatively affect the provided health services.

Implementing financial incentives within a decentralised health system is a real challenge. Health workers could be attracted from one remote state to another remote one rather than from the capital Khartoum (see section 5.2.1). Therefore, a central body is needed to manage and coordinate between different states to ensure that no health professional will be attracted from other underserved states. The increased trends of migration have been considered by many respondents negatively affecting retention of doctors in underserved states. These trends have increased in recent years due to the deterioration of the economic status of the country along with availability of jobs in neighbouring countries such as Saudi Arabia and Libya.

Conversely the policy makers know that most of these doctors are planning to migrate outside the country simply because the salaries of the recipient countries are much higher than Sudan. These findings are rather disappointing because the Sudanese health system cannot afford to increase salaries to rates closer to amounts paid in the recipient countries in order to retain Sudanese doctors in the country. These findings reflect the negative impact of migration on the staffing of remote rural areas with doctors and other health workers. Saudi Arabia has recruited more than 10 000 medical doctors in its health facilities. This number is expected to be 20 000 the coming three years. This requires some polices to be introduced to stop or reduce migration of doctors and other health professionals. Bilateral agreements between Sudan and the main recipient countries could be a good start. It is clear that the secession of the South Sudan in 2011 has negatively affected the economic status of the country due to the loss of the two thirds of oil production. Accordingly, it could be appropriate for the government of Sudan to think about reunite the two countries. This may be useful for the two countries as the new country South Sudan also relies on the Sudanese pipelines and ports to export its oil. In addition to that South Sudan has also suffered from a civil war which needs the collaboration of Sudan to participate in the resolving of this problem.
It is clear that there is a real challenge in recruiting midwives in the public health sector. Also the NHIF did not include the home delivery in their benefit package. If this happens it could have a positive impact on the financial situations of midwives who provide home delivery services for the insured women in remote rural villages. Employing retired health workers who are still productive should be considered in areas with severe shortage. This initiative has been found in some middle and low income countries (see section 2.5.1). Recruiting retirees back to work was one of the recommendations of the World Health Organisation in 2006 (WHO, 2006). This initiative was considered in many Sudanese states in terms of a private contract with obstetricians, health visitors, and nurse midwives (see section 5.3).

As stated in the literature chapter, health workers in rural areas may use coping strategies to increase their financial benefits such as working in the public and private sectors, this being known as dual practice. Dual practice may be condoned or overlooked in many countries. However, if it spreads among health professionals it could lead to a decrease in the quality of healthcare provided to rural communities (Humphreys et al., 2009). Coping strategies such as dual practice are practised in Sudan; some of the physicians tend to open their private clinics during the working day. Different maternal health workers may earn from these practices. For example, obstetricians may open their clinics in the cities, doctors in small towns or big villages while the village midwives enjoy their paid deliveries. The findings of this research show that some midwives may cope with the shortage of their income by growing and selling vegetables and fruit. This finding is consistent with what was found in Tanzania (see section 2.5.1). In spite of its bad consequences these coping strategies really help maternal health workers to stay in rural and underserved posts.

The findings suggest that dual practice is common especially for specialists including obstetricians. Dual practice such as running a private clinic along with working in the public sector, could have a negative impact on the quality of the provided health services (Humphreys et al., 2009). One solution could be to follow the Thai model of paying non-private practice allowance to health professionals in exchange for not working in private clinics (Henderson and Tulloch, 2008). Another strategy could be to regulate dual practice to secure the interest of the doctors without abusing the health system. This could represent a practical and rational solution for the problem.
The availability of private practice is always an issue; if there is a possibility of running a private practice then rural areas will become more attractive to medical doctors. Some doctors are reluctant to work in rural areas because of losing the opportunity to make money from private clinics in urban areas. Private hospitals are not available in other states as in Khartoum. This makes it difficult for junior doctors to utilise this opportunity similar to their counterparts who are living in Khartoum. Many of the participants stated that most of the consultants working in underserved states are likely to move to Khartoum when they become well-known to work in private clinics. These clinics in Khartoum are considered more profitable than other states.

The findings reflect the concern of some respondents about the high rates of caesarean section. As stated in the literature chapter, in many areas increased caesarean delivery is presented as a good achievement of the health system. Caesarean section is considered an appropriate intervention to deal with obstetric labour cases (see section 2.5.4). However, this service may have bad consequences as a mother who delivers through caesarean section is unlikely to deliver her next baby normally by vaginal delivery. A high caesarean section rate is also a concern in South African private clinics (Gerein et al., 2006). This issue seems to be in need of more investigation by health authorities in many countries. If the investigations confirm that the doctors in low income countries tend to recommend caesarean sections for mothers to increase their financial returns, this means that there might be new coping strategies added to the literature.

6.3. Reflection on compulsory service

Compulsory service is defined as mandatory deployment of newly graduated medical doctors to remote and underserved states for a specific period of time (Frehywot et al., 2010). The purpose of compulsory service is to ensure that health services are accessible in underserved areas. This mechanism was implemented in more than 60 countries all over the world (WHO, 2010). The presented findings in section 5.2.1 suggest that the compulsory service programme has significantly contributed to staffing rural areas with medical doctors and hence increasing accessibility to maternal health services in rural Sudan. This staffing mechanism has been capable of deploying many medical doctors to remote areas where until that time no doctors were available. This mechanism is not only improving the availability of doctors in underserved states but also helps in improving their competencies. Doctors deployed to rural areas have opportunities to
practise skills in different medical fields. Also because those doctors may work as single front liners, they deal with many emergency and complicated cases. These develop their skills and improve their knowledge.

Studies conducted in South Africa and Ecuador (Cavender and Albán, 1998; Reid, 2001) reveal that doctors who complete their mandatory service period in underserved states could decide to stay longer in a specific post subject to their conviction of the offered retention packages. This may include financial incentives or permanent job opportunities in a specific area. However, some doctors may stay longer for other reasons such as family factors (see section 2.5.2). It is clear that compulsory service has helped in increasing the availability of doctors in the targeted underserved states in Sudan, hence helped in addressing inequitable distribution of doctors and facilitating the provision of maternal health services in the targeted areas. The presented findings in section 5.2.1, 5.3 and 5.5 suggest that when combined with financial incentives and better working and living conditions the compulsory service is likely to be a more successful mechanism. Other outcomes of compulsory service include that underserved populations tend to appreciate and respect the attendance of doctors in their areas. The Sudanese experience related to compulsory service could be useful for other low income countries particularly the “time incentive”. Time incentive means that doctors deployed to areas with security concerns, whether a conflict area or post conflict area, have to spend a shorter period than others. This initiative has encouraged many doctors to serve in these areas.

The literature suggests that doctors who work in rural areas will appreciate rural health issues, because they have practical experience in these areas (WHO, 2010). There are also other advantages for the doctors who have been posted to rural health facilities. Many doctors have reflected the fact that working in rural health facilities has enabled them to work independently and made them more confident because they deal with emergency cases themselves. This has increased their knowledge and skills.

The uniqueness of the Sudan experience in compulsory service is its introduction of the “time incentive” which is not found in the relevant literature. This “time incentive” has encouraged many doctors to join remote underserved areas. Accordingly, doctors who serve a compulsory service period in the Blue Nile state have to stay for a shorter period than those who serve at Sennar state, while again the period spent in Sennar state is less
than other states closer to the capital Khartoum. As stated in the findings chapter, the main concern about this mechanism is the high turnover of doctors deployed through this mechanism. This goes with findings of the WHO research on attraction of health workers which include high turnover rates among the main concerns around the compulsory service mechanism. However, health services with expected turnover are considered better to no service of any kind (Frehywot et al., 2010).

6.4. Reflection on the interventions related to working and living conditions

The problem of Sudan is an imbalance in infrastructure between big cities and remote rural areas, this in turn leads to reluctance of highly skilled personnel to go and stay in rural areas (see section 5.2). This requires balanced infrastructure to be considered at the same time as efforts to achieving balance in health worker distribution. It is very important to keep the health workforce satisfied and motivated as motivation could prevent them from exiting their professions. The interventions related to improving living conditions in underserved areas will facilitate attraction and retention of public sector workers including healthcare providers. According to the WHO (2010), improving the working environment in rural health facilities could make the rural posts professionally attractive for health workers. Provision of lifestyle-related services could help in encouraging health workers to serve in rural areas (Ebuehi et al., 2011). These infrastructural interventions could also facilitate economic development of the rural areas.

It is not only about staffing interventions such as recruitment, deployment and retention. It is also about provision of an enabling environment in terms of infrastructure, equipment and supplies along with an efficient and effective referral system. Maternal health providers need to work in a supportive and enabling environment which is essential for effective provision of maternal health services (see section 5.5). Also maternal mortality could be adversely affected by lack of a referral system or unavailability of emergency obstetric care. Many maternal deaths in remote rural areas occur as a result of the second delay which is associated with poor roads, poor transportation and unavailability of ambulatory services in rural health facilities.
The literature shows that health professionals are always reluctant to work in health facilities lacking basic equipment and supplies such as gloves, running water and basic medicines (Henderson and Tulloch, 2008; Kotzee and Couper, 2006). The productivity of maternal health workers wouldn’t be high in the absence of a supportive working environment that enables them to effectively transfer their knowledge into practice. Equipping and refreshing health facilities should be considered as an essential part of a broader investment related to retention of health workers to underserved areas. Improving working conditions is not only attracting health workers to specific posts or motivating them to staying longer but also is very important for better maternal health outcomes. Good performance and better health outcomes work as a motivator for the health workers. The findings show examples of midwives who feel satisfied and motivated when their patients deliver healthy babies (see section 5.5.2).

The evidence from the literature suggests that improving working environments is likely to improve the efficiency and productivity of maternal health providers. These health workers believe that an inappropriate working environment will prevent them from applying what they have learned at their training institutions (see sections 2.5.3 and 2.6.6). Rural facilities need to be equipped and provided with anaesthesia machines, oxygen cylinders and new natal care units. The findings also stress the reality that producing maternal health providers without provision of essential enablers such as equipment and supplies along with effective referral system won’t make any difference. Lack of gloves may expose them to dangerous infections which could prevent them continuing as healthcare providers. Excessive working hours was also identified as one of the factors behind the doctors’ decisions. The findings show that the doctors interviewed in Sennar and Blue Nile states prefer not to work in hospitals because of excessive working hours there. This confirms the findings of Kim (2000) who conducted research in India and identified excessive working hours as one of the reasons behind leaving specific posts.

The findings suggest that good working conditions is not only about providing health facilities by electricity and water supply but also about providing these health facilities with essential equipment and supplies to enable the health workers to save the lives of their patients. As stated in the findings chapter a health worker could decide to leave a specific area because he/she couldn’t accept people dying in front of his/her eyes as a result of shortage in consumables. Hence this research suggests that the definition of
working conditions should be enlarged to contain provision of consumables, blood banks and availability of support staff to enable the health workers to better perform their tasks.

Many respondents have reflected their frustration due to lack of effective ambulances to save women’s lives (see section 5.5.1). Some health workers and managers expressed their dissatisfaction with rural community behaviours which led to bad health outcomes. The main reason for these negative behaviours is the lack of health education, thus health awareness activities should take place to bridge the knowledge gap of rural communities. The findings also confirm the importance of local labour relations as a motivator for health workers. This suggests that managers should encourage health workers to collaborate with each other in order to have a healthy working environment.

Suitable accommodation has an impact on the retention of Sudanese medical doctors, as stated in the findings section that the females started to come and stay in underserved states after the building of appropriate accommodation there. The findings suggest that females always place higher value on suitable accommodation and better living conditions than males. This is in line with a finding from South Africa which suggests that suitable accommodation is one of the main reasons behind retention of doctors in remote posts (Kotzee and Couper, 2006). Facilitating joint location of the health workers with their spouses may have a positive impact on retention (Martineau, 2012). The information provided by the female medical doctor who has stayed at one of the rural hospitals for more than four years because her husband is working there, suggests providing employment opportunities for partners of doctors in underserved areas could help with the attraction and retention of doctors to these areas. It also emphasises the importance of family factors on the decisions of the health workers when deciding to stay or leave specific posts.

Female friendly policies need to be adopted in order to attract female doctors to rural and underserved states. These policies could target the building of more suitable accommodation. The accommodation should be secure and provided with essentials such as electricity, internet services and digital televisions. Sending female doctors to rural areas in pairs and for a short period of time should be considered. This could help them to stay in underserved areas; it also helps to overcome workload problems if they exist. These female doctors can collaborate and help each other in issues related to their career advancement. Given that females always prefer to work in areas next to their
families, the policy makers should consider this reality when designing polices and strategies related to attraction and retention of doctors to rural areas.

The health managers believe that the turnover of medical doctors who work in health facilities which belong to the NHIF is lower than the turnover in the health facilities which belong to the ministries of health. This is because the NHIF facilities are well furnished and equipped and the work load in NHIF facilities is lower than public hospitals where doctors may work in shifts, including night shifts. The findings of the empirical field work confirm the findings of the literature which assumes that health workers don’t prefer working in health facilities with a high workload (see section 2.5.3). The literature shows that increased workload can lead to increased stress levels and high rates of turn over which in turn could have a negative impact on the quality of the provided healthcare services. As highlighted in the literature chapter, high rates of turnover might lead to harming the memory of the health facilities. This in turn could lead later to repetition of tasks and consequently a waste of time and resources (see section 2.5.3).

Also the NHIF pays doctors who work at its health facilities more than what the ministry of health pays doctors. This reflects the reality that the financial incentives and good working conditions could have a positive impact on staffing remote rural areas. The impact of retention interventions will vary amongst different health workers; for example the health workers with children are expected to appreciate the availability of schools for children more than those who have no children. Equipping health facilities may require more financial resources which should be considered when designing health polices and strategies. This indicates that investment in the health sector is crucial to creating an enabling environment.

The presented findings have reflected the importance of security in staffing underserved states. In that safety of the working environment is essential, financial incentives are not enough to convince medical doctors to go and work in rural areas in conflict regions. The findings show that civil war has affected the retention of health workers in conflict zone areas including Darfur, Blue Nile, and Southern Kordofan states. This finding confirms the result of the study conducted in Angola (Pettersson et al., 2004). This also agrees with Maslow’s hierarchy of needs which puts safety and security just next to physiological needs of the human being (Maslow and Lewis, 1987). It is clear that the
security problems have a negative impact on staffing remote areas with maternal health workers and the provision of maternal health services. This was very clear in conflict zone states. Efforts should be accelerated to reach a comprehensive peace agreement between the government and the rebels. The international community including United Nations agencies could play a major role as facilitators in peace talks.

Supportive supervision is considered one of the main components of an enabling environment necessary for staff working in underserved states (see section 5.5.3). Maternal health providers should be supervised to ensure maternal health services of good quality are being provided in rural areas. The literature shows that supportive supervision could have a positive impact on satisfaction which in turn could lead to good performance and may facilitate retention of health workers (Couper et al., 2007). Health workers feel satisfied when they deliver good healthcare services (Gerein et al., 2006). As presented in the findings that midwives are feeling satisfied when safely delivering babies, this research confirms the importance of sense of achievement (see section 5.5.2). This goes with motivations theories particularly Herzberg theory. Similar findings were also found in some middle and low income countries including Mali and Armenia (Fort and Voltero, 2004; Van Dormael et al., 2008; Dieleman et al., 2006).

Supportive supervision from specialists for general doctors who work in rural hospitals could make a significant difference. Monitoring and evaluation of the performance supported by feedback could have a real impact in improving maternal health services in Sudan. Lack or weak implementation of supervision tends to be associated with shortage of financial resources. This also is the case in some low income countries as shown in the literature review chapter (see section 2.6.6). Financial allocation should be considered to support supervision related activities. As stated in the findings chapter supervision visits may be negatively affected by on-going conflict in some states (see section 5.5.3). This indicates that lack of security has a negative impact on interventions related to creating an enabling environment.

Recognition and respect are amongst the key motivators of the health workers (see section 2.5.3). The presented findings show how the public recognition of the services provided by doctors and midwives to the rural communities could improve their confidence and increase their interest to work in remote underserved areas. As an interviewed medical doctor from one of the rural health centres explains, he has chosen
to stay longer because of support and recognition of the local community (see section 5.4). This is consistent with the evidence provided in the literature which suggests that community support could encourage health workers to choose to work or to stay longer in specific posts (Grobler et al., 2009).

It is clear that the public participation could play a major role in facilitating retention of health workers in remote areas. One of the reasons behind the success of the midwifery training programme is that the midwifery trainees were recommended by their local communities. Cultural beliefs of rural communities could play a positive and negative role in retaining the health workforce in rural areas. It could also negatively affect better maternal health outcomes. Cultural beliefs and community traditions are not only affecting rural women’s access to healthcare services, but also the performance and retention of female health workers. This is clear in the examples of female doctors who work in New Halfa and the interviewed midwives along with the views of health managers from different levels. This suggests that the government should adopt health education programmes particularly among rural populations in order to improve their awareness. Health education for rural communities particularly in maternal health issues is crucial.

Personal and professional support is very important for health workers in remote areas because they experience a sense of isolation, hence support from local communities could help in minimising this sense of isolation (WHO, 2010). As recommended by many participants, the health managers should consider redistributing every two medical doctors in one rural health facility; this might be a practical solution for isolation and is expected to have good results in terms of increasing their opportunities for social interaction; it could also give them chances to consult each other and to utilise mutual knowledge. This in turn is likely to reduce their sense of isolation and also facilitate their career advancement.

The presented findings suggest that the interventions related to paving roads, providing electricity, and building schools are very important for the attraction and retention of health workers in the rural areas. This reality suggests that more attention should be given to general developmental issues which also emphasise the importance of coordination in planning between health sector organisations and other authorities. Such
interventions are likely to improve access to maternal health services and also make these areas more attractive for the maternal health workforce and other public sector workers (WHO, 2010). Interventions which target improving the water supply and sanitation could also help in improving rural health. This is very important particularly in conflict and post conflict areas as the infrastructure is negatively affected by the ongoing conflict in Darfur, Southern Kordofan and Blue Nile states. Underserved states always suffer from marginalisation and neglect since the British era and even after the independence of the country in 1956. Thus, balanced distribution of health workers won’t be achieved unless a set of measures to overcome the inequalities are implemented. These measures should be thought and agreed upon at both federal and state levels and respond to the needs and expectations of the population in these areas.

It is not acceptable to rely on emergency humanitarian aid especially for essential and continuous issues such as maternal health. The NGOs who provide these services can stop their services at any time; furthermore these organisations rely on unsustainable fund. Accordingly, the government should take its responsibility to serve its population whether in conflict zones or elsewhere. Healthcare delivery is a real challenge particularly in areas with complex humanitarian emergencies such as Darfur, Southern Kordofan and Blue Nile states. The literature shows that ongoing conflicts always lead to imbalance on healthcare delivery as well as health workers distribution (Witter, 2013). Thus, post conflict areas need special consideration to help the recovery of the health systems in these areas. This could include infrastructural investments related to refurbishing healthcare facilities and general development of public services such as paving roads and electricity and other relevant investments.

Some of the issues which have been raised in the study may require interventions from authorities out of the health sector. Sustaining peace in the conflict areas may require interventions not only from the government but also from the international community. Health problems cannot be separated from security, safety, better living and working conditions, and the economic situations of the country.
6.5. Reflection on task shifting initiative

As stated in the previous chapter, even though there is no written policy about task shifting, it exists and is widely practiced in Sudan. Task shifting is supported by the Addis Ababa Declaration in 2008. Evidence from Australia shows that the level of satisfaction of health workers to whom the tasks had been shifted is higher than others (Hoodless and Bourke, 2009). In terms of quality of services provided by health workers with enhanced scope of practice, evidence provided by WHO shows no difference in quality (WHO, 2010). This agrees with the findings of this research; the respondents didn’t report any difference in quality of the family planning services provided by midwives on behalf of the health visitors. Instead, they admit that the maternal health providers to whom the tasks are being shifted are effectively providing maternal health services to rural populations. Task shifting initiative looks promising in addressing the shortage of highly skilled health professionals in underserved areas; however, continuous monitoring and evaluation should be considered to ensure safe outcomes (WHO, 2012).

Also there are no concerns raised about the tasks provided by the assistant’s health visitors on behalf of the health visitors. These findings suggest that enhancing the scope of practice of lower maternal health providers have significantly contributed to the provision of maternal health services in rural Sudan (see section 5.6). Thus the policy makers should consider this initiative as one of the solutions to overcome the shortage of highly skilled health professionals in remote underserved areas. However, the health workers with enhanced scope of practice may need supportive supervision to ensure the provided healthcare meets the standard.

The advantage of task shifting is that the health workers to whom the tasks are being shifted such as mid-level health workers are likely to stay longer in rural areas (WHO, 2012). Training and producing mid-level cadre takes less time than highly skilled health workers. The certificates of mid-level cadre including midwives are currently not accepted out of the country controlling their capability to migrate outside the country. Task shifting initiative again needs to be supported by in service training programmes and career progression for the health workers with new roles.
As stated in the findings chapter, the policy makers are reluctant to introduce shifting some tasks to lower levels. It seemed to be they expect resistance from some health professionals to this initiative. Obstetricians and doctors could be reluctant to ceding tasks related to obstetric surgeries as these surgeries represent one of the main sources of income for doctors and obstetricians. A lot of workshops need to be organised in order to set clear guidelines about the task shifting initiatives. This should be considered and agreed before graduation of new cadres from the Academy of Health Sciences. This initiative is very helpful in optimising the role of lower maternal health providers. To ensure quality of healthcare services provided by the health workers with enhanced scope of practice, activities such as in-service training and supportive supervision need to be considered regularly to develop the skills and improve the knowledge of the staff to whom the tasks are being shifted.

The FMOH should organise meetings with the relevant professional associations to state and agree about the guiding principles including boundaries between the professions which are targeted by the initiative. Suggested meetings to legalise and organise task shifting should include managers of healthcare organisations, health system researchers, human resources specialists, ministry of higher education, international and local donors, WHO representatives, professional associations related to the health sector. Those participants should tackle all the anticipated weaknesses of the initiative. Success can only be achieved if the concerns of different stakeholders are considered. These measures could facilitate informed decision about the task shifting initiative that could have a positive impact on the provision of health services to the rural populations. Sudan also needs to assess the experience of some African countries in shifting tasks of medical doctors to the medical assistants. Task shifting requires supportive supervision, resources and good working environment. Thus, each staffing intervention is dependent on other staffing interventions which strengthens the point raised by Lehmann et al. (2008) that one intervention will not make a difference while a bundle of interventions could force change.

6.6. Reflection on training and educational interventions

According to the WHO (2010), students who took their medical education in remote underserved areas are more likely to practise in rural areas than those who studied in urban medical faculties. This argument was supported by evidence from Congo which is
an African low income country (Longombe, 2009). Evidence from Canada also shows that doctors who undertake their foundation training in rural medical schools have higher propensity to work in rural areas than others (Mathews et al., 2012). Accordingly, the literature on attraction and retention of health workers recommends selecting rural students because their probability of working in rural areas is higher than those from an urban origin (WHO, 2010; Woloschuk and Tarrant, 2004). As shown in the presented findings (see section 5.7.4), the students who have their medical education at a specific state have more desirability to work at that state after graduation. This is the case in Darfur, Kasala and Sennar states.

This suggests that the establishment of more medical schools outside the capital Khartoum could have an impact on retention of doctors to underserved states. However, such an intervention needs time and money. Time factor should be considered before adopting interventions as some may take more time than others. For example, financial interventions could be implemented within a short period of time and could have a quicker impact than establishment of medical schools outside the major cities. In Sudan the quality of secondary schools in underserved states is not at the same level as in Khartoum, hence specific quotas tend to be allocated to students from these states on condition that these students serve in their states for a specific period of time. Viet Nam and Thailand were amongst the countries that have adopted initiatives based on allocating quotas in medical schools to students from a rural origin (see section 2.5.6). In Sudan it is not clear whether those doctors serve in their states after graduation or not; instead it is clear that the medical doctors who have their medical education in a specific state regardless of whether they are originally from that state or not actually have a high tendency to serve in those states.

Monitoring and evaluation mechanisms are needed to effectively utilise the services of doctors from a rural origin who have been given places on condition that they serve in their underserved states. Hence the relevant partners including ministry of higher education along with states government should put this as one of their priorities. The presented findings show that midwifery is chosen as a profession for many reasons including the desire to help the community and save mothers’ lives (see section 5.7.1). One of the main reasons behind the success of Sudan to reduce maternal mortality could be that the health system succeeded in training respectable numbers of midwives and
convinced them to work in remote underserved areas where their skills and competencies are needed most.

Increasing availability and accessibility of EmOC services is one of the main rights of mothers (Bradley and McAuliffe, 2009). As stated in the previous chapter, the training of doctors in EmOC has been considered by many participants as one of the main reasons behind the reduction of maternal deaths (see section 5.7.2). This indicates that it is not only about deployment and recruitment but also about training to ensure that the doctors and other healthcare providers have the required capabilities to enable them to perform the job perfectly. Hence ministries of health need to continue in EmOC courses. Shortcomings related to the implementation of these courses need to be addressed. Sustaining adequate supply of blood to the EmOC facilities is one of the challenges that need to be addressed by the Sudanese health system especially in underserved states. These efforts could increase access and utilization of the EmOC and could play a major role in reducing maternal mortality. The purpose of training programmes is to improve the skills of the targeted health workers to enable them to provide healthcare services perfectly. This programme has successfully achieved this purpose in addition to having a positive impact on increasing the satisfaction of the trainees.

As stated in section (2.6.6), there are three delays associated with maternal death; the first delay is in taking the decision to seek care while the second delay occurs on arrival at a health facility; the third delay happens in the provision of adequate care. The findings demonstrate that the first delay happens as a result of lack of awareness, while the second delay is associated with inefficient referral system. The third is associated with availability of emergency obstetric care services. Accordingly, the referral system should be strengthened by equipping referral points and paying more attention to ambulances. The health system managers should make sure that emergency obstetric care services are available in all referral points. This could have a positive impact on improvement of maternal health services and could have a real impact on the reduction of MMR in all states. Increasing the availability of trained midwives is a successful strategy and has a real impact in reducing maternal deaths particularly in remote areas. To reduce maternal deaths we must increase the availability of the skilled birth attendant particularly in rural and underserved areas. Training, whether basic or in-service, has a real impact. Maternal health providers adequately trained in recognizing
and managing obstetric complications has decreased maternal mortality ratios in recent years.

Sudanese initiative in family medicine is more or less similar to Thailand which provides tuition fees and other subsidies for some students who are recruited by the Ministry of Health in exchange for working in remote rural areas after graduation (Wibulpolprasert and Pengpaibon, 2003). This post-vocational initiative seemed promising, however, efforts should be made to convince doctors to pursue this speciality. The advantage of family physicians is that they can cover a variety of health issues and they can deal with common disease more effectively than other specialities. This initiative has helped in sustaining the availability of family physicians in many underserved areas and consequently helps in reducing inequitable distribution of doctors in remote areas.

An unintended outcome of this initiative is that it helps the doctors who joined this programme to migrate outside the country. Doctors who qualify as GPs are marketable in neighbouring Saudi Arabia and other Gulf countries. However, this reality won’t prevent the policy makers from continuing this training programme because the Sudanese health system is able to utilise their services for at least two years. Family medicine initiative looks promising because it provides opportunities for continuing education for the general doctors to become family physicians. The importance that Sudanese doctors placed on career progression opportunities were consistent with similar findings from different African countries including Ghana, Kenya and Benin (Snow et al., 2011). This ties in with literature on attraction and retention of health workers which identifies opportunities for continuing education as one of the main factors which influence health workers’ decision to accept a specific job (Lehmann et al., 2008).

The findings of this research revealed that a successful training programme is not necessarily requiring a certain level of education; instead illiterates could successfully understand training programmes. This research showed that the illiterate midwifery trainees have successfully understood midwifery training programmes when attached with other literate trainees (see section 5.7.1). This indicates that policy makers in low income countries should not make illiteracy a barrier hindering them from training enough numbers of midwives in remote underserved areas. Another reason behind the
success of midwifery training programmes is that the midwifery trainees were recommended by their local communities with respect to the agreed standards.

In spite of the respectable efforts to recruit and employ midwives, recruiting midwives and paying them regular salaries still remains the real challenge for the Sudanese health system. Absorbing them into the civil service will enable them to receive regular incentives and become eligible to enjoy a social security package which includes pension and health insurance services. Training sites closer to rural communities as a mechanism for training midwives whose fathers or husbands are reluctant to send them far from their home villages is one innovative mechanism (see section 5.7.1). This successful initiative was not found in the literature before. This finding suggests that decision makers should try to be creative when dealing with problems. Unsuccessful managers are those who try to pin their failure on others; policy makers should respect the traditions and customs of rural communities when designing health initiatives. This successful experience suggests that traditions and customs of rural communities shouldn’t be an excuse for failure.

Midwifery schools within the Academy of Health Science have played a major role in facilitating the graduation of a reasonable number of midwives who help in assisting a large proportion of women in safe deliveries all over the country. These schools have successfully attracted educated and younger candidates who are qualified for better understanding of the training courses. The presented findings reflected the importance of partnership between the relevant governmental and nongovernmental bodies. The coalition of relevant stakeholders including NGOs could make a real contribution.

Given that community participation has shown a great influence in training and retaining health workers in rural areas, it is very important to include the community representatives from the targeted populations to support and influence policy changes. Such partnerships could have a real impact on provision of maternal health services to rural populations.

Conflict is considered a major factor affecting health workers’ lives and career choices in many post conflict areas in Africa (Martineau, 2012; Witter, 2013). Accordingly, special focus should be assigned to the underserved states suffering from conflict problems. Even if a peace process succeeded, still considerable efforts are required to enable effective utilisation of health workers who may have been appointed by rebels
groups. Merging those health workers in the formal health sector is a real challenge; particularly in the presence of in appropriate professional qualifications.

### 6.7. Reflection on the deployment mechanisms

The presented findings suggest that the decentralisation of the health system has a negative impact on the distribution of health workers (see section 5.2.1) and a negative impact on the recruitment of medical doctors. Equitable distribution of health workers is associated with equitable provision of healthcare (Martineau, 2012). The government should consider distributing medical doctors and specialists like other centralised cadre such as the army and police officers along with judges. When a doctor is posted to a rural area there are many advantages and disadvantages, the disadvantages include being isolated from colleagues, unable to be up to date like others who work in Khartoum and in most of the cases far from family. The advantages include having more incentives, developing their skills, becoming able to work independently and more confident because they deal with emergency cases themselves.

Unlike medical doctors there is no problem in deploying midwifery trainees to their villages. The experience of Sudan shows that midwives who are recruited from remote underserved areas into midwifery training programmes are more likely to go back and serve their rural communities than other health workers such as doctors. The advantage of deploying these midwives back to their rural communities include that they are aware of the cultural issues in these communities. This means that they will respect the cultural beliefs when delivering their services. Medical students who graduated from medical schools located in rural areas are more likely to work in rural locations. This research confirms that most doctors serving in Sennar, Kassala and Darfur originally receive their medical education there.

There is no contradiction between the findings of this research regarding the decentralisation issue. For instance, research conducted in Tanzania has shown that centralised measures are effective in achieving a balanced distribution of highly skilled health professionals, while decentralised arrangements are effective in recruiting and retaining lower level personnel (see section 5.2.2). It is clear that while the medical doctors are always concerned with their career advancement and their personal
development, midwives are mainly concerned with recruitment and having a permanent job. Most doctors prefer to stay in Khartoum in order to be close to educational institutions which enable them to be up-to-date and aware of any new investigation test, new treatment or new equipment. While midwives just prefer to stay in their villages and be closer to their communities in order to build good relations and to get the trust of these communities. This could help them in having many customers which could have a positive impact on their financial status.

Visiting consultant initiative introduced by NHIF has helped in increasing the availability of consultants in the underserve states to provide a variety of healthcare services including maternal health services. Even though it lacks permanency, it has a positive impact on staffing rural areas with specialists. Registration requirement initiatives include requesting new medical graduates to serve in underserved states during their practical training period before registering them as doctors. This pre-vocational intervention has also helped in sustaining the availability of medical trainees in many underserved areas and consequently in reducing inequitable distribution of doctors in remote areas.

Sanctions should be adopted to ensure compliance with the deployment mechanisms (Martineau, 2012). One of the main weaknesses of deployment system is the ineffective implementation of sanction against those who refuse to comply with the deployment regulations. This is clear in the examples related to medical students who didn’t work at underserved states; given that their sponsorship was conditional to work in these areas after graduation (see section:5.7.1). Effective deployment of staff relies on managers who manage the health system (Martineau, 2012). The policy could be well thought, but the failure could be a result of ineffective policy implementation. Thus, monitoring and evaluation are vital to the sustainability of effective deployment of health workforce particularly for remote underserved areas.

6.8. Reflection on the role of partnerships and coordination

The presented findings suggest that coordination and partnership could play a remarkable role in staffing rural health facilities and retaining staff there. This is very clear in the role of NGOs, NHIF. The findings have clearly highlighted the role of partnership between the ministry of health and the health insurance fund in the retention
of the health workers. These joint efforts are not only in terms of financial incentives for doctors and specialists who work in underserved states but also in basic health infrastructure such as building and equipping and supplying health facilities. Also in different states both the Ministry of Health and the NHIF subsidise the living costs of medical doctors who live in doctors’ camps. NHIF distributes health insurance cards for midwifery trainees in some states, such as the Blue Nile state. The partnerships between the ministry of health and UN agencies along with other international organisations have played a major role in supporting training programmes for midwives in many underserved states. Health systems in many post conflict areas are broken down and become dependable on the emergency aid delivered by the humanitarian and charitable groups (Martineau, 2012). In Sudan the NGOs deliver primary healthcare in post conflict areas such as Darfur. However, the main concern around these services is that it doesn’t include tertiary care services. In addition to that, the provided services are mainly focused on displaced camps around the main cities rather than remote rural areas which could be in real need. Other concerns include that these organisations lack flexible budgets to deal with emergencies and other humanitarian crisis.

The presented findings show that NHIF has made a remarkable contribution towards retaining the maternal health workforce in underserved areas. In different states the NHIF subsidises the living costs of medical doctors and distributes health insurance cards for midwifery trainees in some states, such as the Blue Nile state (see section 5.3). The introduction of a health insurance scheme in 1994 has helped in increasing health sector resources. These resources helped in refurbishing health centres in underserved states and giving better financial incentives for the medical staff. It also helps in improving the working conditions and living conditions for those who work in underserved states. These forms of partnership suggest that the resource gap could be bridged through collaboration between healthcare organisations. Thus, coordination and collaboration mechanisms should be supported inside and outside the health system.

6.9. Reflections on the adopted methodology

Realist evaluation has helped in identifying the past and current strategies related to staffing remote rural areas with maternal health workers. Many of these strategies are more or less similar to those found in the literature. In addition to that, this method has helped the researcher in identifying other initiatives found in Sudan but not in the
literature. These initiatives include visiting consultants, female doctor accommodation, sharing retention incentive with different partners, training of illiterate midwives by attaching to literate ones, training sites closer to rural communities, time incentive for compulsory services by offering doctors a shorter time in the less secure or most remote underserved states (see table 11 in section 5.8). These suggest that if the study is replicated in other low income countries it may reveal similar findings. These findings could be other initiatives not identified or recognised in the available literature.

The developed CMOCs have really helped in exploring and explaining what works, what doesn’t, how and under what circumstances. In addition to that the findings also include explanations for CMOCs from the empirical work (see section 9.1). The findings of this research could help other low income countries in better staffing of their rural areas because it enables them to understand not only the functioning interventions but also the failed ones with sufficient information about the questions why, how and under what circumstances. This research has shown the effect of an intervention might have different impacts for different groups of healthy workers. For example, building suitable camps for doctors in underserved areas has met with a respectable response from female doctors.

Henderson and Tulloch’s framework is quite promising and has provided a good base for understanding the health workforce. This framework has helped the researcher in identifying the relevant literature sources and in guiding the thematic analysis in the findings chapter. However, the researcher believes that it may be useful to have two frameworks for understanding health workers: one for doctors and other for midwives (see figures 6 and 7). Better understanding of health workers is crucial for designing appropriate strategies that can improve the attraction and retention of health workers in remote underserved areas and consequently improve health outcomes. The findings suggest that needs and expectations vary from doctors to midwives. While doctors are concerned with higher salaries, career advancement and better living and working conditions, midwives are mainly concerned with being recruited in the health system in order to receive a regular salary. The most relevant interventions to improve the understaffing of rural areas could be the financial incentives for specialists and doctors, compulsory services for junior medical doctors, while training and recruitment seemed to be the most important for midwives.
Factors affecting Sudanese midwives' retention in rural areas

- Lack of employment opportunities
- Financial factors
- Gender, age, and family considerations
- Personal and family factors
- Working and living conditions
- Cultural norms may prevent them from joining training programs
- Recruitment in the civil service system
- Training sites closer to rural communities
- Salaries, additional income from mothers
- Better living conditions, Safe and supportive working environment
- Equipment and supplies supervision, job description

Key:
- Factors
- Interventions
Figure 8 Factors affecting Sudanese doctors’ retention and strategies for responding to these factors
Chapter seven: Conclusion and recommendations

7.1. Introduction

Staffing remote and underserved areas with the health workforce is one of the main challenges facing Sudan in achieving the MDGs including reducing maternal mortality by three quarters. A literature review related to staffing remote rural areas with maternal health workers followed by documentary analysis helped the development of the CMOCs relating to staffing remote rural areas with maternal health workers. These CMOCs were tested through semi-structured interviews with policy makers, executive health managers and health workers. Thematic analysis with respect to the initial CMOCs and the developed attraction and retention framework has aided the presentation of the findings. These findings were analysed and discussed with respect to the relevant literature to facilitate the development of recommendations which need to be considered to achieve better staffing of rural health facilities. In this section the researcher will try to form general conclusions with respect to the previous discussion. This conclusion will be followed by general recommendations. After that the main limitations of the study and the implications for further research will be outlined. In the last section the researcher will conclude by showing his contribution to the knowledge.

7.2. Conclusion

The researcher has undertaken a realist evaluation of selected key initiatives adopted by the Sudanese health sector, including NHIF initiatives that have been implemented in order to staff rural areas with maternal health workers. The findings have been presented in the form of what works, what does not, how, for whom and under what circumstances. The findings of this study are expected to be useful for different health organisations focusing on service delivery, such as the federal and state ministries of health along with the NHIF. These findings might also help policy makers to design better plans for the achievement of universal access to healthcare for rural and underserved communities. The realist evaluation has helped the researcher to come up with a revised attraction and retention framework (see figure 6 and 7 in section 6.9). The researcher is keen to ask what works, what does not, how, for whom and under
what circumstances (see the CMOCs based interview guide in section 9.3.). These questions were asked for every single intervention in order to capture all the contextual factors behind each intervention.

This method has helped the researcher to realise that needs and expectations vary from doctors to midwives. While doctors are concerned with higher salaries, career advancement and better living and working conditions, midwives were mainly concerned with being recruited in the health system in order to receive regular salaries.

The government of Sudan has tried different ways to improve the staffing of rural health facilities by attracting health workers to rural areas and retaining them there. The shortage of health workers in remote rural areas is the main obstacle for Sudan to achieve the Millennium Development Goals (MDGs), including reducing the maternal mortality ratio (MMR) by 75% by the year 2015. Recruiting midwives and retaining medical doctors in rural and underserved areas remains the main challenge of the Sudanese health system. Sudan has started to invest in producing mid-level cadre who are less likely to migrate and have a high tendency to work in remote and rural areas. These interventions are focused on quantity and quality of HRH by focusing on producing, training, and developing the health workforce.

Migration of health workers is also a challenge facing the Sudanese health system. The presented findings show that unless the government is able to address this challenge the shortage of doctors will remain an unsolved problem. Public salaries are still low in Sudan compared with high salaries in high income countries; this makes it difficult for Sudan to compete in this market. Developed and richer countries should help low income countries to retain their highly skilled personnel. However instead of doing so, they work as competitors to attract highly skilled health professionals from low income countries to work in developed and high income countries.

This research has shown that a limited health budget is one of the main problems of the Sudanese health sector. If these budgets were increased it could have a real impact in helping the health sector to address the shortage of health professionals in the country. However, this option is always difficult particularly for low-income countries; accordingly producing and training mid and lower cadre is always a practical choice. This research has shown that the frustration of health workers is not necessarily merely due to the financial incentives they receive; instead the frustration of doctors could be for the reason that there are no supplies to save the patient’s life. This study has
illustrated an example of a health worker who left one of the rural health facilities because of lack of supplies.

The study shows that the financial incentives are necessary to satisfy the needs of health workers and their family’s needs. However, non-financial incentives such as better working and living conditions, career advancement opportunities and training are also influential factors of health workers’ decisions to stay in specific posts. In spite of the argument made by some researchers that the male doctors are more likely to practice in rural areas than female doctors, this research shows that building suitable accommodation for female doctors in underserved areas could make a difference.

The findings of this research show that cultural issues may affect the attraction and retention of health workers to specific areas. The presented examples of midwives and female doctors who could not work away from their husband or family along with findings about the rural population who prefer training their daughters, wives and sisters not far from them, all confirm the effect of cultural issues. Family factors always have a real effect on health workers’ decisions to stay in or leave a specific post. Some midwifery trainees don’t like to be trained far away from their home villages or towns as shown in the case of Wager Midwifery School. Women always prefer to be closer to their husbands and families. Female friendly policies are essential. Married female doctors are trying to perform their professional duties without harming their family responsibilities. Being a physician who wants to look out for her patient, a mother caring for children, and a spouse aiming at satisfying her husband’s demands is a real challenge.

One of the main contributions of this research is that it shows rural origin is important in selecting midwifery trainees because they are likely to stay in their home villages. Attraction and retention interventions appear to be crosscutting; accordingly, health sector organisations need to coordinate with other sectors such as civil service authorities, labour unions and other relevant bodies. This research contributes to the knowledge because the presented evidence is not only in the form of what works and what doesn’t but also in the form of why, how and under what circumstances.

The findings suggest a lack of clear monitoring and evaluation mechanisms for the staffing interventions. If they exist, it could help in identifying the relevant
shortcomings which, in turn, could facilitate proper solutions in achieving better health outcomes. These solutions could include merely modification of the functioning interventions or to it consider new retention interventions. However this requires a strong information system which is always a challenge for low income countries. Accurate and reliable data could assist health system managers in adopting informed corrective actions (WHO, 2010).

The Sudanese health system needs to be strengthened in order to be qualified to deal with the major challenges. The challenges related to creating effective deployment mechanisms could not be effective in the absence of an efficient health system. An enabling environment in terms of creating better working conditions such as provision of ambulances, blood banks, equipment and supplies are essential. Effective information systems could help both policy makers and health workers to improve the performance related maternal health. Financial incentives should be evaluated from time to time in order to assess their efficacy in retention of health workers. The outcome of this assessment could help in modifying and increasing rural allowances in order to encourage health workers to come and stay longer in the targeted underserved areas.

The findings of this research are not only from the health managers’ perspective but also from the front liners point of view. This method increases the validity and reliability of the provided information. This research shows that better understanding of the health workforce is the first step in designing retention strategies. The failure of health systems to satisfy the basic needs and motivate health workers could have a negative impact on their availability and consequently negative impact on the delivery of healthcare services. Producing health workers and deploying them to rural areas without providing them with the required skills, equipment, and supportive supervision and in service training is unlikely to make a difference.

The implication of the shortage of health workers has a negative impact on access to healthcare services and on health workers who are currently working in underserved states, because these workers become overloaded with more responsibilities. This again could lead to more frustration and could increase attrition rates. The outcome of the provided healthcare services is one of the main factors affecting the motivation and satisfaction of health workers. This is in accordance with Maslow and his hierarchy of needs, who puts self-esteem and achievement as part of his model. It could also affect their retention in a specific area as shown in the presented examples.
Positive discrimination to the advantage of underserved states is applied in many aspects. For example, the compulsory service programme reduces the period that should be spent in underserved states up to half. The findings suggest that this policy has a positive impact on attracting doctors to underserved states. Also, the financial incentives paid to doctors vary according to the remoteness of the area, in that doctors who serve in remote states receive more than those who do not. The findings also suggest that compulsory service, which is supported by financial incentives, has a real impact in staffing underserved states with medical doctors. However, for female doctors, this should be supported by suitable accommodation to attract them to underserved states.

The availability of human resources for maternal health, mainly doctors and midwives, is essential for providing antenatal, postnatal, and emergency obstetrics care services. This research shows that equitable distribution of health professionals will not be achieved by addressing only the motivation factors related to health workers; instead, coercive measures, such as compulsory services, are necessary to address the inequitable distribution of highly skilled personnel.

The findings from the empirical study show that the implemented interventions have clearly improved the availability of doctors and midwives in underserved states and hence positively contributed to improving maternal health outcomes. The adopted interventions are not only aimed at increasing the availability of health workers but also increasing competences, productivity, and their responsiveness. It is expected to improve the accessibility of maternal health services, which, in turn, could improve the health status of the population. This research shows that staffing remote rural areas is not only about increasing the number of health workers, but also about improving the competencies and skills of health workers before and after being deployed to the targeted areas. Improving the working environment is crucial to enabling the provision of healthcare services to the required standards. Interventions such as provision of electricity, telephone services, and sanitation are expected to have a positive impact on improving living conditions as well as improving working environments. Thus, the availability of better living conditions will eventually lead to better working conditions.

This study is unique in that it is the first study to apply realist evaluation of the strategies related to staffing remote rural with health workers in Sudan. The realist evaluation has proved useful in this research; it helps the researcher to get answers for what works what doesn’t, how and under what circumstances. For example, the
compulsory service mechanism for staffing remote rural areas could work better for males rather than females. The researcher also has shown that the doctors could go to serve in underserved states through this mechanism if it was combined with financial incentives. This research has clearly explained the past and current initiatives that have been adopted by the Sudanese government to staff underserved areas with maternal health workers. It has also shown how the “context” can affect the success or failure of these strategies, the mechanisms that have either worked or could work and the potential outcomes.

7.3. Recommendations and policy implications

In this section the researcher is going to suggest some recommendations based on the discussed findings. These recommendations will be classified according to the expected resource implications.

7.3.1. Recommendations with financial implications

Infrastructural investments are important to facilitate good living conditions that could help the attraction and retention of maternal health providers. These interventions are also expected to strengthen the referral system. Investment in transportation systems could facilitate an effective referral system that could help in addressing the second delay in seeking care. Consequently, this could reduce maternal mortality. Referral systems should be strengthened and improved by securing sufficient numbers of ambulances for the main rural hospitals and health centres. Strengthened referral systems require referral units to have emergency backup. Bundled interventions are important to address the shortage of health workers including attraction and retention. The government should invest in its health workforce and its health facilities including adopting retention strategies capable of attracting and retaining medical doctors to the underserved states. Centralised arrangements for recruiting and retaining highly skilled health workers need to be considered. Increasing the availability of health workers is necessary to achieve better health outcomes including achieving MDGs.

Policy makers should make sure that proper training is available for all health workers to enable them to carry out their tasks. Intake in obstetrics speciality should be expanded to enable large numbers of doctors to join this speciality. This could help in increasing the number of graduating obstetricians and subsequently improve the chance
of having more obstetricians for the underserved areas. This requires increasing funds for midwifery training programmes especially the VMWs programme including supporting midwifery schools with sufficient financial allocation to enable successful implementation of training programmes. To reduce maternal mortality, it is very important to improve the number of health facilities that could provide EmOC services as availability of equipped emergency obstetric units is vital to creating an enabling environment for maternal health workers. Increasing the numbers of general doctors with obstetric skills seems to be a promising strategy to overcome the shortage of obstetricians in remote underserved areas. However, the reported shortcomings related to effective implementation of training programmes in EmOC services needs to be addressed. The government should focus on potentiating obstetric competences for doctors and other mid-level cadres. This could have a positive impact on maternal health services particularly in remote rural areas.

Positive discrimination to the advantage of females and underserved states in terms of building more suitable accommodation should always be seriously considered and discussed. Sufficient financial resources should be allocated to the health sector to facilitate payment of salaries to different health workers. A respectable share for these financial resources should be allocated for creating an enabling environment for health workers with provision of equipment and supplies particularly in remote areas. Political commitment should be translated into more financial allocation for the health sector to enable effective delivery of healthcare for the population. Generally, the government should consider increasing the financial resources for midwifery related services including approval of midwives as service providers in the health insurance benefit package. NHIF should consider including home delivery in the benefit package of the insured. This could have a positive impact on maternal health particularly for remote rural women who have no alternative service providers.

7.3.2. Recommendations with minimal financial implications

Training of mid-level cadres is a key intervention. Midwives carry out most of the deliveries in Sudan and around 80% of these deliveries take place at home. The government of Sudan needs to pay more attention to midwives in terms of training, recruitment along with enabling them to access equipment and supplies to secure safe deliveries for the rural women. Training programmes of general doctors in EmOC
seemed promising. Hence, Ministries of Health need to continue EmOC courses. These training programmes need to be expanded to enable large numbers of doctors to utilise these training programmes.

Security arrangements especially for the female doctors are crucial in order to create an enabling environment and to attract them to the underserved areas and retain them. The ministry of health and the NHIF should pay more attention to community health workers including midwives. This could have a positive impact on maternal health services in rural areas.

7.3.3. Resource neutral recommendations

Managers should always focus on keeping their employees motivated and satisfied to secure better outcomes. Showing respect and recognition of the services provided by doctors and midwives to the rural communities could improve their confidence and increase their interest to work in remote underserved areas. The ministry of health should pay more attention to supportive supervision. Follow-up is crucial for a successful health system; hence, health system managers should advocate regular visits for rural areas. Redistributing doctors in pairs (particularly female doctors) might be a practical solution for isolation and could be expected to have good results in terms of increasing their opportunities for social interaction. It could also give them chances to consult with each other, and to utilise, mutual knowledge. These in turn are likely to reduce their sense of isolation and also facilitate their career advancement.

Regulating dual practices is important and should be performed in a way that maintains the rights of health workers to earn money without harming the patients’ rights to receive high quality healthcare. Debated issues, such as high rates of caesarean sections, need to be considered and discussed amongst policy makers. Female-friendly policies, such as considering their family issues when deploying them to rural areas could help in staffing remote rural areas with health workers.

The policy makers should reconsider the decentralisation of health authorities in order to enable effective deployment and distribution of medical doctors. Central rotation systems, particularly for doctors and specialist doctors, should be considered. Introduction of polices to stop or reduce migration of doctors and other health
professionals is crucial. Human resource interventions relating to the reduction of maternal mortality should always be considered in general health sector plans. After introducing interventions, it is very important to monitor and evaluate these interventions to determine which retention approaches work best, how they do so and why.

More co-ordination between the ministry of health and health insurance in maternal health is essential. This coordination is needed to improve PHC services including provision of home delivery services for rural women. In addition, coordination between health sector organisations and other authorities is required to create an enabling environment. Community related interventions are crucial for addressing the contextual factors that hinder accessibility and utilization of maternal health services in underserved areas. These could include improving health awareness amongst rural populations and fighting illiteracy and poverty. They could also include health education for rural communities particularly in maternal health issues. Moreover, interventions aimed at improving maternal health should respect the health seeking-behaviour of rural populations.

7.3.4. Recommendations which are expected to reduce the cost of healthcare

The Sudanese government should consider task shifting initiatives to facilitate provision of maternal health services to underserved communities. These could include enabling medical assistants to perform surgical operations related to maternal health services. This requires in service training programmes to potentiate the skills of healthcare providers to whom tasks may be shifted. Successful deployment initiatives such as Visiting Consultant Initiative need to be supported especially in transferring doctors and obstetricians to the remote rural areas.

7.4. Limitations and implications for further studies

This study is dependent on the relative infancy of the realistic evaluation method (Chambers et al., 2013). Some researchers are not aware of this method; this may affect the reliability of the method particularly for those who are not adopting a realism perspective as an epistemological position. A further limitation is that, this study did not focus on all health workers related to maternal health such as pharmacists, lab technicians who also play important roles. During testing and refining the initial
CMOCs by interviewing people, other CMOCs kept arising from the respondents. The researcher tested and refined new CMOCs; however, some of these CMOCs still need more refinement within differing contexts and for different mechanisms. These include interventions related to employing retirees and regulating dual practice. In addition to that some suggested female interventions such as enabling them to work in pairs need to be further explored. Interventions related to the shortage of anaesthetists also require further investigation. However, these limitations have already been identified by the founders of the realist evaluation, indicating that the realist evaluator should keep testing and refining these new CMOCs until he/she exhausts the available resources.

The researcher suggests some areas for further investigation. These include investigating staffing remote rural areas with health workers who are not under focus in this study. This may include pharmacists and lab technicians. Linking staffing in remote rural areas with other health issues rather than maternal health could be useful. These health issues could be child health and malaria. In addition to that it could be useful if this research is replicated in other low-income countries in order to compare and contrast results. In this case the initial CMOCs could be merged with other CMOCs coming from empirical field work (i.e. the CMOCs in table 3 with those in section 9.1).

The actual causes for increasing caesarean section operations in Sudan need to be further investigated by exploratory study in order to identify the real causes of this phenomenon. This study may be replicated in other low-income countries; it may result in similar findings in terms of identifying other initiatives which may not have been identified and recognised in the available literature. These studies will pay more attention to ‘context’ in identifying what works and what doesn’t.

7.5. Contribution to the knowledge

This study has contributed to knowledge by exploring a specific issue in a particular context. Most of the studies on attraction and retention of health workers focus specifically on different categories of health workers without relating their research to a specific health issue, such as this research which is focused on maternal health workers. This research revealed that maternal health services have unique characteristics that need to be recognised, analysed and discussed. This is the first study to apply realist evaluation on the initiative relating to staffing remote rural areas with maternal health workers worldwide. This method has helped the researcher to identify interventions that
are found in Sudan but which are not present in the literature and to summarise the key differences. A further contribution is the recognition that different strategies are appropriate for male and female doctors. Other contributions include developing separate attraction and retention frameworks for doctors and midwives.

7.6. Concluding remarks

Past and current initiatives to staff underserved areas with maternal health workers in Sudan have been identified and summarised. Realist evaluation gains a deeper understanding in the working of interventions and aids the construction and testing of CMOCs related to staffing remote rural areas with maternal health workers. This research shows how the “context” affected the success or failure of these strategies. Accordingly low-income countries with similar contextual factors might utilise the findings of this research to address the inequitable distribution of its health workforce. Producing mid and lower level cadres who are less likely to migrate and have high tendency to work in remote and rural areas is likely to have a real impact in reducing maternal mortality. This should be combined with approving the task shifting initiative in order to address the shortage of highly skilled health professionals in underserved areas. Coercive measures, such as compulsory services, are necessary to address the inequitable distribution of highly skilled personnel.

This research shows how the coordination and partnership between different organisations has played a remarkable role in staffing rural health facilities and retaining staff there. It is worth mentioning that many of the recommendations in this study are resource neutral or require minimal financial resources. For example, legislative activities to approve task-shifting initiatives could help in reducing the cost of provided healthcare. Other resource-neutral interventions include planning, monitoring and evaluation. Managers can keep their subordinates motivated by showing respect and encouraging them to work in teams without paying them money. Interventions related to increasing community awareness could be implemented with unremarkable financial resources.

Deployment of these workers to rural areas needs to be followed by providing them with the required skills, equipment, and supportive supervision and in service training in order to achieve the required outcomes including reducing maternal mortality. Understanding the workforce will help in adopting appropriate strategies to attract and
retain them in the targeted areas. It is not enough to find answers for what works and what does not. These questions need to be followed by understanding how and under what circumstances these changes are likely to occur. This research has shown that needs and priorities differ from one group of health workers to another. The research has contributed to the knowledge by developing separate attraction and retention frameworks for doctors and midwives. Furthermore interventions, which are found in Sudan but not in the literature, have been identified and summarised.

The experience of the researcher enabled him to realise that linking a broad framework with a specific issue is really helpful in producing new knowledge that respects the special characteristics of that issue. Low income countries have their own characteristics which need to be respected when designing theoretical frameworks around a specific topic. Undertaking research with the appropriate methodology is useful in enabling the researchers to produce new knowledge.
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9. Appendices

9.1. CMOCs from the empirical field work

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9.2. Sample of an interview

Investigator (I): Tarig Ali

Respondent (R): Health manager from FMOH

I: could you please give me an idea about the adopted strategies and initiatives to attract and retain obstetricians to remote rural areas and underserved states?

R: Obstetricians are considered to be the corner stone in provision of maternal health services and reduction of maternal mortality ratio in Sudan. From my experience in the health sector, there is no strategy particularly targeting retention of obstetricians to remote underserved areas. However one of the positive things is that the obstetric registrars within the medical specialisation board are now representing number one in terms of numbers, because there is desirability among many general doctors to become obstetricians. This helps in increasing their availability in the states.

I: you’ve mentioned that obstetrics is the most desirable speciality, what is the reason behind that?

R: I haven’t come across a study that considers this issue, but as you know now the females represent the majority of new graduated doctors. The females by their nature prefer obstetrics rather than other specialities. Also some doctors may look at the speciality from an economical point of view.

I: That is good, if we move to the second type of health workers who provide maternal health services who are Registrars (obstetrics trainees), what motivates them to stay longer in the states?

R: Those will become specialists in the future. Again the functioning strategies are targeting registrars generally rather than specific registrars in particular speciality. Unfortunately I’ve noticed that the majority of registrars tend to be located in the capital Khartoum. One time I’ve come across a study which revealed that 93% of registrars are located in Khartoum while only 7% are located in other states. However this is not the case now because the Sudanese Medical Specialisation Board has approved training sites in different states in the last two years. They start to deploy registrars to these sites, and this made a real change and improvement in the distribution of all registrars including obstetrics registrars to other states. For the time being I’ve no statistical figures to confirm what I’ve said but the officials of Medical Specialisation Board have
said that there is improvement in distribution of registrars to the states. As you know when registrars including obstetrics registrars move to the states, this will positively impact on the provision of health services including maternal health services.

I: could you tell me about the initiative called Registrar Zero (R Zero)?

R: it is a system for the general doctors who want to qualify as specialists. The health sector used to recruit those doctors as R Zero doctors. These doctors have to pass part one and part two of the agreed medical speciality within a specific period of time. R Zero is the stage before registrar; the doctors who are interested in becoming specialists including those who want to become obstetricians could join R Zero stage.

I: is it an initiative from the ministry of health or from Sudanese Medical Specialisation Board?

R: it is from Federal Ministry of Health, the Sudanese Medical Specialisation Board has nothing to do with that, because R Zero is jobs which have been created by the ministry of health. The doctors who pass part one of any medical speciality such as obstetrics will be considered as registrars.

I: what are the benefits of this initiative?

R: it creates jobs for doctors who have no job at a specific period of time. Those doctors provide their services in different hospitals in Khartoum and some other states. However this initiative is neither sustained nor stable, I don’t think it is functioning now.

I: if we move to the third group that has relation with maternal health which is the general medical doctors. What are the measures that motivate them to go and stay in the states and remote rural areas?

R: generally there is no specific incentive package to encourage doctors to go to rural areas and states. But there are some states trying to attract them by offering permanent jobs. As you know there is a problem in recruiting medical doctors, the doctor could wait for one year, two, three, or four years in order to get a job in Khartoum. So some doctors could be attracted to the states because of availability of permanent job there at a rural hospital or health centre. The availability of jobs should be a normal thing; however it becomes an incentive in itself because there are no jobs, so the doctors could go there just to enjoy the permanent job. The second thing is that some doctors may
choose to go to some remote areas because they expect to run a private clinic there. Also some communities adopt some initiatives such as helping doctors in accommodation and provision of means of transportation. There is also the initiative of Family Medicine, in that there are some states like Gezira, River Nile and other states that have already started to encourage its doctors to join this initiative. In spite of these efforts, I think there is no clear governmental policy that secures central topping payments and permanent incentives. In the past there was an attempt to secure rural allowances for medical doctors, however it was not successful. However I noticed that the medical doctors who are working at rural hospitals have a real role in the provision of maternal health services. Some programmes such as Reproductive Health Programme tend to train doctors in emergency obstetric care (EmOC). This training programme is really useful, because it makes sure that the front line doctors are capable of dealing with emergencies and complications such as obstetric labour. The doctors can intervene by doing surgical operations. I can confirm that the medical doctors have a real role in the provision of maternal health services, but I’ve no statistics to prove this reality.

I: you’ve mentioned the emergency obstetric care training programme, is this programme adopted by some organisations or is it implemented by organisations in accordance with ministry of health?

R: I think it is adopted by Reproductive Health Programme with contribution from United Nation Population Fund (UNFPA), World Health Organisation along with other organisations. Finally, it is a reproductive health initiative.

I: if we talk about compulsory service as a mechanism for deploying doctors to remote rural areas. Do you think it is a successful mechanism?

R: from my experience the compulsory service has played a major role in deploying the medical doctors to the states when the health system is incapable of doing so. Compulsory service mechanism also reduces the period and pays better to those who go to remote underserved states. This resulted in better deployment of doctors. I remember that there are many health facilities which used to be staffed by lower cadre and after implementation of the compulsory service programme were staffed with medical doctors for the first time. The compulsory service has made a real contribution and I am sure this has positively impacted on provision of health service to the communities.

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I: To what extent has the compulsory service programme succeeded in utilizing female doctors?

R: In recent years the compulsory service programme has changed, in the past it was very effective because the number of doctors is so small. But this is not the case as a result of increase in medical schools. This increases the availability of medical doctors in the states. As I told you there are many factors which attract them to the states rather than compulsory services. So I think the compulsory service programme’s officials need to rethink other strategies such as postponing for medical doctors until they become specialists. This could help in achieving better distribution of the specialists. The role of compulsory service nowadays is not as in the past because the doctors have started to go to the states for different reasons and the number of female doctors is increasing day by day. As you know it is difficult to deploy the females to the states. The compulsory service coordinators sometimes try to post the females in Khartoum facilities while rotating the males in the states. In spite of this trend, many females have gone to remote states for different reasons.

I: That is excellent; do you think the central rotation mechanism of doctors could work again?

R: Now there is a discussion about this issue, but there is dilemma about this issue because the constitution has authorised the states to recruit all civil service cadre up to scale one. So this reality has weakened pro-rotation point of view because it is seen as suggestions that contradict the functioning constitution. But in practice we noticed that there is imbalance in distribution of doctors because they prefer states with better resources and good indicators. There is absence of a national authority which should promote balanced distribution of health workers. Though there is discussion about implementing a rotation system again, because it could help in achieving balanced and equitable distribution of health workers among the states. The distribution should base on the health map. In short I believe that the decentralisation is not a successful experience particularly in dealing with equitable distribution of health workers.

I: I think the speech is going well, there are some initiatives related to staffing remote rural areas such as shifting some tasks to lower levels of health workers. Does this practice exist in the Sudanese health system? Or have you tried to consider it in one way or another?
R: I think this practice does not clearly exist in Sudan as in some African countries. Countries such as Tanzania, Malawi and Uganda along with other African countries have experienced severe shortage of doctors and responded to this challenge by enhancing the scope of practice of some health workers to fill this gap. These countries have authorised some lower health workers to perform surgical operations. But this is not the case in Sudan; we have no shortage like these countries. However, I think we need to consider shifting some tasks rather than surgical operations. Now there are efforts to promote training of health workers such as medical assistants, assistants in dentistry and pharmaceutical services along with other medical fields. These efforts aimed at scaling up these health workers to a university degree, this will enable us to increase their scope of practice and could facilitate task shifting. This policy is approved and under implementation by two ministries, the ministry of health and the ministry of higher education. Some of those cadres have graduated. I can say there is no clearly stated task shifting policy but what I have said more or less could be considered as task shifting because this cadre has been scaled up with more skills and with university degrees. This cadre is capable of doing better than before. However, I’ve noticed that this task shifting trend has started to cause conflict among professions such as doctors, dentists and pharmacists. They start to believe that these new cadres may cross the threshold to their boundaries. I think the task shifting issue should be put on the table for discussion, because it has not been presented for conversation yet. It should be discussed and adopted with clear guidelines. This is important to convince different health workers that task shifting is not aimed at making contradictions and overlapping between different health professionals. Instead it aims to provide health services with high quality.

I: if I want to speak to you as director of the academy of health sciences, could you please tell me about your training programmes for midwives whether they are nurse midwives, technical midwives or village midwives?

R: I can tell you that these health workers are important like obstetricians because simply they are the front liners. For example, the midwives are the ones who attend deliveries at villages. The health outcomes there are mainly dependable on their efforts. In the last few years there has been a real gap in the numbers of midwives in different areas because of lack of training programmes to generate midwives. Also there are concerns regarding their competency and performance. The government has realised that this is a real problem, and then the reproductive health directorate within the
ministry of health has started to conduct some studies and surveys on the midwifery field. They end up with a conclusion saying that, midwives need more advanced training. Then the midwifery curriculum in the academy of health sciences has been amended from one year to two years. Then there was expansion of training opportunities. Now there are more than 4000 midwives who are enrolled in the two year midwifery training programme. Our plan is to have a technical midwife in each village. There is also a plan to upgrade village midwives to become technical midwives by having a second year training programme.

Health visitors and nurse midwives will be recruited in hospitals and health centres. There is a severe shortage in these two cadres. There is a plan to regenerate these cadres with new skills. The academy of health sciences has recruited three batches of midwives who are supposed to work at hospitals. These 120 midwives also are eligible to undertake postgraduate studies; this will qualify them to lead training of midwifery cadre in the coming days. I think any reduction in midwives’ numbers will eventually result in an increase in maternal mortality ratios in the country. What I’ve told you is our plan for midwifery health workers, if it goes as we plan then good outcomes will be expected.

I: what about the village midwives? Are you going to replace them with technical midwives in the future?

R: our new health polices will based on differentiating between nursing and midwifery; in the past all medical assistants, nurse midwives, health visitors have to begin their career by nursing training. We decide to adopt different and separate pathways for each profession meaning that those who want to qualify as midwives have nothing to do with nursing and vice versa. The graduated midwives with university degrees will gradually replace the nurse midwives in the hospitals. But the nurse midwives will continue until we train enough midwives with a university degree.

I: do you think these midwives are meeting the skilled birth attendant’s criteria?

R: we are always trying to make sure that the curriculum, educational and training facilities are standardised. But practically a lot of work needs to be done; I think we are working towards the standards.

I: I’ve noticed that there is a real problem of recruitment of midwives in many states?
R: this is a common problem and it is one of the main limitation factors that constrain the development of the Sudanese health system. There is a paradox in this issue, because while there is a real need for midwives, in contrast there are no jobs to recruit them. The main reason behind this phenomenon is the bad economic conditions of the country. The general governmental policies are also in the direction of cutting public expenditure especially in public sector employment. But I think this trend could result in bad consequences to the health sector.

There is a real problem in recruiting midwives, in the past the midwives were out of the health system. Health system managers believe that their main task is just to train these midwives who are considered as community cadre, they believe that this cadre could receive payments in cash or in kind from their communities in return for provision of deliveries or any other services that they may offer.

In recent years there have been many economic changes in the country. Hence the ministries of health have adopted campaigns to recruit midwives in the health sector. The government has agreed to recruit midwives, however the implementation varies from one state to another, as a result there are many midwives who are not recruited yet.

I: what about the tendency of these health workers to go back to where they come from?

R: this is the case for all health workers apart from doctors. Also the procedures adopted by the academy of health sciences have helped in this success. We tend to select our candidates from rural backgrounds with respect to specified quotas for each locality. Moreover the training sites themselves are located in different states. All these procedures have helped in retention of these cadres in their own villages.

I: you’ve reflected on the impact of rural background, do you think the establishment of medical schools in the states such as Kasala and Darfur has impacted on the retention of doctors in these states?

R: in fact I’ve never come across any study or statistics in this subject. Generally most doctors whether studying in Khartoum or other states have a real tendency towards Khartoum, migration and higher education. Also we’ve heard from the officials of the ministry of higher education that there is no follow-up mechanism for medical students who utilised underserved states quotas on the condition of working in these states upon graduation. Actually there is no specified body to remind and order those doctors to work in their original states.
I: you’ve spoken about migration, how could you respond to this challenge?

R: migration is one of the major challenges of the health system, in the last two years many health workers including maternal health providers have migrated outside the country. The migrated health professionals represent different specialities with different age groups. The number of migrated specialised doctors is not bigger than the migrated general doctors, but it has a clear negative impact. For example losing one qualified trainer could outweigh more than two other health providers. We have lost many registrars and medical doctors. Losing a trained front liner such as a medical doctor who works in a rural hospital is harmful. All these health workers are now migrating.

In the past only doctors tended to migrate, but now many health workers such as nurses, midwives and other health workers start to migrate in progressive numbers. I can say that migration is not a threat for only the rural areas and the states instead it represents a warning for the overall Sudanese health system.

I: do you think the medical assistants could fill the shortage of doctors?

R: to some extent, because they are front liners who are located in areas which couldn’t be accessed in the rainy seasons. The advantage of this cadre is that it has broad training enabling them to provide a general package of health services. This cadre is dependable because they refer the patients on time and they are capable of treating general diseases. The problem is that most of the medical assistants have retired and there is attrition in this cadre. Now we have started to train new batches of medical assistants in the academy of health sciences with the intention to recruit and retain them in the states.

I: have you started to train new medical assistants or is it just plans?

R: there is one graduated batch; the other batches are under training.

I: what is your strategy regarding community health workers?

R: they are also very important health workers. Internationally the world health organisation has started to support employment of this cadre. Many international reports particularly from the WHO and from developing countries revealed that there are many remote rural areas without any health workers. There is some rhetoric saying that how could we rely on health workers who receive only nine months of training. But I will ask those people to choose between leaving these remote rural areas with no cadre or to staff these areas with less trained health workers. Definitely the second option is more
rational and more practical. Those people have to understand that there is a difference between theory and practice. Those people believe that it is not acceptable to bring the community health worker while there are many medical schools in the country. Those people have no right to oppose the return of the community health worker because there are many rural populations without any cadre. It is against humanity to leave some segments of the population without any healthcare provider.

When the WHO calls for employment of the community health worker, we respond to this call. All states ministries of health including Khartoum ministry of health have approved training of the community health worker. We have graduated about 1000 community health workers and there are another 3000 under training in different states. This cadre is very important especially for the nomadic communities, small isolated villages and other communities.

I: to what extent are the training programmes for the medical assistants and the community health workers related to maternal health?

R: definitely it is related to the maternal health because those health workers receive broad training. You can consider the medical assistant as a small doctor while the community health worker could be considered a small medical assistant. The community health worker could recognise the signs of complicated deliveries especially in nomadic and rural communities. Moreover they can refer, deliver primary treatment, and provide health education. If there is a mother with pregnancy complications they can give general advice in such cases.

I: have you any other views or comments related to this issue or do you want to give any general recommendations?

R: the issue of retention is not an easy problem; it is complicated and couldn’t be managed by one or two strategies. Only bundled interventions which complement each other could make a difference. Health workers have different requisites; these basics could be financial, professional, social and family related conditions. This indicates that a package of intervention only cannot make the required difference. Some people in some states may offer up to 5000 SDG ($1000) without response from the specialised cadre. It is not as simple as they believe because these health workers could have other requisites rather than the financial incentives, that is to say the package of incentives is very important. There are studies such as “discrete choice experiment” which suggest a
combination of incentives in different categories in order to know which package could convince the majority of doctors to go to rural areas. The outcome of these studies could be in the form of recommendations to the policy makers for example, if the policy makers pay a financial incentive with suitable accommodation and secure schools for the kids this package could convince 70% of the doctors to go to rural areas.

On the other side there are other people who believe that only functioning enforcement mechanism could ensure better staffing of remote rural areas. However, I think enforcement mechanism without incentives will not succeed and vice versa; both of them are important. The combination of agreed incentive package with clearly stated contract is the best solution. The policy makers need to consider these ideas before making any decisions.

Unfortunately in equitable distribution is a major problem. Some people believe that an increase in medical schools will solve this problem. However, this is not true for the reason that most of the doctors prefer to wait for jobs in Khartoum for years rather than go to other states. In practice many doctors prefer to go abroad than to go to remote rural areas. Retention of health workers need well designed initiatives associated with clear commitment from the government.
9.3. Interview guide

9.3.1. Interview guide for the interviews with the policy makers at federal level

*What are the functioning interventions/mechanisms that help to attract and retain doctors to rural and underserved areas?

*If not mentioned I will ask about the compulsory service, conditional licence that can only be fulfilled by working in rural areas, rotation of medical doctors between areas, specialised training opportunities in exchange of working at rural areas, financial incentives.

*How does each of these interventions/mechanisms work (in terms of improving the presence of doctors in rural areas, improving access to maternal health services in rural areas) in different states/rural areas? Could you please show me any reports that support what you have said?

*How does each of these interventions/mechanisms work/not work for different doctors for example male/female, young/old, with respect to different socio economic backgrounds…etc.? Could you please give examples?

*What are the impacts of supportive supervision, in service training (for staff/maternal health outcomes)?

*If not mentioned I will ask about improving satisfaction of maternal health workforce, improve their skills, knowledge, encourage them to stay, improve maternal health outcomes, improve performance and the quality of care in rural areas.

*Why does (supportive supervision, in service training) not work in some rural health facilities/for different health workers?

*Could you please tell us about the training programmes in EmOC for general doctors in the states/rural/underserved areas?

*Do you think that this programme helps in filling the gap of shortage of obstetricians in your state/area? How?

*What are the challenges of shifting tasks to lower levels of health workers? Could you please give examples?
*How does the training of Skilled Birth Attendants help in reducing maternal death especially for home deliveries in rural areas?

*Could you please show me any administrative reports that support what you have said?

*Did you use a task shifting approach to fill the gap of (Health visitors, Doctors, Nurse-Midwife, Anaesthetist…) where they are not found?

*What are the advantages and disadvantages of task shifting initiatives for the patients/health workers/efficiency of the health system? Could you please give examples?

*What are the benefits of task shifting initiative for rural populations? How?

*Why does this initiative succeed in some places and fail in others? Could you please give examples?

*How could we make the task shifting initiative more practical and successful?

*Do you think that the health insurance programme has helped in attraction and retention of maternal health workforce to rural and underserved areas? How? Could you please give examples?

9.3.2. Interview guide for executive health managers at the state level

*What are the functioning interventions/mechanisms that help to attract and retain doctors to rural and underserved areas?

*If not mentioned I will ask about compulsory service, conditional licence that can only be fulfilled by working in rural areas, rotation of medical doctors between areas, specialised training opportunities in exchange of working at rural areas, financial incentives.

*How does each of these interventions/mechanisms work (in terms of improving the presence of doctors in rural areas, improving access to maternal health services in rural areas) in different states/rural areas? Could you please show me any reports that support what you have said?
*How does each of these interventions/mechanisms work/not work for different doctors for example male/female, young/old, with respect to different socio economic backgrounds…etc.? Could you please give examples please?

*Do you think that the health insurance programme has helped in attraction and retention of maternal health workforce to rural and underserved areas? How? Could you please give examples?

*Do you think the maternal health workforce working in health insurance facilities are likely to stay longer than others? How?

*Do you think the insured women are utilizing maternal health services more than non-insured? Why?

First ask the executive health managers at the state levels in order to identify which rural health facility has the lowest/highest turnover rate. Then ask those health managers at state levels:

*In your opinion what are the reasons behind each of these trends? Could you please give examples?

*If not mentioned I will ask if (financial incentives, appreciation from managers, colleagues and the community,) have any influence on these trends.

*Why do these mechanisms work differently for different (areas/maternal health workforce doctors, midwife, health visitors, etc.)?

*What are the efforts made in the last few years to improve the working conditions for rural health facilities?

*If not mentioned I will ask about (distributing maternal health related medicines, equipment and supplies to rural facilities, establishment of referral mechanism (linked supervisor, communication, ambulances vehicles), rehabilitation of health facilities and ensuring that they are clean).

*How does each of these mechanisms/interventions affect staff satisfaction, supervision, on job training, the quality of provided health services, referral system?

*In your opinion why does each of these interventions work in health facility A and not work in health facility B?
*In your opinion why do these interventions not work for some health workers?

*How do you provide maternal health services for rural populations who have no health facilities? If not mentioned I will ask about mobile clinics, mobile health, maternity homes, and local recruitment of VMWs besides providing them with equipment.

*How do these initiatives facilitate the provision of maternal health services, improve the presence of health workers in rural areas, improve access to maternal health services for the rural nomadic communities, and reduce maternal deaths in nomadic communities?

*Why do these interventions not work in other areas? Could you please give examples?

*Could you please show me any administrative reports that support what you have said?

*What are the impacts of availability of schools and qualified teachers, paving roads, cleaning water, providing electricity, telephone and internet services on the staff retention/satisfaction?

*How does each of these interventions facilitate the provision of health services?

*What are the outcomes of supportive supervision/in service training on maternal health services/staff?

  * If not mentioned I will ask about improving satisfaction of maternal health workforce, improve their skills, knowledge, encourage them to stay, improve maternal health outcomes, improve performance and the quality of care in rural areas. This will be followed by a how question?

*Why does (supportive supervision, in service training) not work in some rural health facilities/for some health workers? Could you please give examples?

*What are the efforts made in your state/rural areas in order to recruit/pay incentives for midwives (VMWs)?

*How do these efforts help in encouraging them to stay in rural areas and provide their services?

*Do some midwives leave the job/rural areas even after being recruited/receiving incentives? Why?
*How does the AHS help you to improve maternal health services in your state/rural areas through their training and upgrading programmes for health workers?

*What are the benefits of midwifery schools for rural populations?

*How do you provide in-service training for VMWs?

*What are the outcomes of these training programmes?

* Why does this programme works in some areas and fail in others?

*Could you please tell us about the training programmes in EmOC for general doctors in your state/rural/underserved areas?

*How does this programme help in filling the gap of the shortage of obstetricians in your state/area?

*How does the training of Skilled Birth Attendants help in reducing maternal death especially for home deliveries?

*Could you show me any administrative reports that support what you have said?

*How did you use a task shifting approach to fill the gap of (Health visitors, Doctors, Nurse-Midwife, Anaesthetist…) where they are not found?

*What are the advantages and disadvantages of task shifting initiatives for the patients/health workers/efficiency of the health system? Could you please give examples?

*What are the benefits of task shifting initiative for rural populations?

*Why does this initiative succeed in some places and fail in others? Could you please give examples?

*How could we make the task shifting initiative more practical and successful?

9.3.3. Questions related to social health insurance

(These questions will be asked to the executive health managers including health insurance managers at federal and state levels and health facility levels)
*How does health insurance improve the utilization of maternal health services for rural women? Could you please give examples?

*How do the financial payments provided by health insurance help in retaining staff in rural facilities?

*Could you please show me any administrative reports that support what you have said?

*Why did you not include maternal health services provided by lower level cadres such as medical assistants, VMWs in the health insurance benefit package?

*Why did you exclude home deliveries from the health insurance coverage?

*How could we make the task shifting initiative more practical and successful?

*What are the efforts being made by health insurance to improve working conditions related to maternal health services in different states/underserved areas?

*How do these efforts help in improving the quality of maternal health services?

*Could you please provide me with a historical background about (Visiting Consultant Initiative/Obstetricians)?

*Why did you decide to adopt this initiative?

*What are the benefits of this initiative for health cadres in rural areas?

*What are the challenges of this initiative?

*How does the (Visiting Consultant Initiative/Obstetricians) help in providing maternal health services to rural women?

*Could you please show me any administrative reports that support what you have said?

*What are the initiatives made by health insurance to attract and retain maternal health workforce to rural areas (doctors/midwives)?

*How do these initiatives help in improving maternal health services for rural women?

*Do you think that the health insurance has helped in attraction and retention of maternal health workforce to rural and underserved areas? How? Could you please give examples?
*Do you think the maternal health workforce working in health insurance facilities are likely to stay longer than others?

9.3.4. Interview guide for the health facility level

Questions for maternal health workers who are working in rural health facilities that provide health insurance services

*How has health insurance helped in improving the utilization of maternal health services in this health facility?

*How has the availability of health insurance services affected attraction, retention of maternal health workforce in your (area, health facility)?

*Do you think that the health insurance has helped in attraction and retention of maternal health workforce in your (area, health facility)? How? Could you please give examples?

*Do you feel that health insurance has improved your retention in this area? How?

*How could we make the task shifting initiative more practical and successful?

Questions for a doctor who has worked at a rural health facility for at least one year:

*How did you come into this post? (In order to determine which intervention/mechanism works)

*What motivates you to stay longer in this post?

*How has your presence helped in reducing maternal deaths and improving maternal health in your area?

Questions for health worker from each profession (doctors, midwives…)

*Why do you feel satisfied/dissatisfied in this health facility?

*How does (financial incentive, appreciation from managers, colleagues and the community,) encourage/discourage you to stay longer?

*How does community appreciation affect your satisfaction?

Questions for the health facility manager:
*how could we make the task shifting initiative more practical and successful?

*In your opinion what are the reasons behind turnover/or satisfaction in your health facility?

Then targeting a health facility where these interventions (Distributing maternal health related medicines, equipment and supplies to rural facilities, rehabilitation of health facilities and ensuring that they are clean, establishment of referral mechanism (linked supervisor, communication, ambulance vehicles)) work and ask a doctor/midwife:

*Why have each of these interventions succeeded?

Then target a health facility where these interventions partially or completely implemented but not work and ask a doctor/midwife:

*Why do each of these interventions fail to produce the desirable outcome?

Select a village/rural area which has utilized maternity homes/mobile clinics/mobile health and interview the VMW there:

*Do you think this maternity home/mobile clinics/equipment/mobile health with linked supervisor has facilitated the provision of maternal health services to your community? How?

*How has this maternity home/mobile clinic/equipment/mobile health/led to reduction of maternal deaths in your area?

*How does the recruitment help you to provide the services for your population?

Targeting any rural areas where health workers’ children are (studying at school or receiving childcare), or the health worker himself is enjoying flexible working hours. Then ask the health workers:

*How do these services encourage you to stay longer?

Then targeting other areas where these services exist but have no effect (health worker who enjoys the same service but decides to leave the area or to stay shorter or feels dissatisfied)

*Why have these services not affected your retention, satisfaction, encourage you to stay longer?
Rural health facilities where: all or part of these interventions/mechanisms implemented or available (availability of schools and qualified teachers, paving roads, cleaning water, providing electricity, telephone and internet services) then interview the manager of the health facility:

*How do these interventions improve staff retention, facilitate provision of health services satisfaction and reduce the turnover?

Then targeting health facility where these interventions/mechanisms are implemented or available but do not work then interview the health facility manager:

*Why do these interventions not work?

Then select two health facilities where (supportive supervision, in service training) implemented with good/bad results? And ask maternal health workforce:

*What are the advantages and disadvantages of these interventions?

*Do you think these interventions have any relation with satisfaction of maternal health workforce, improve their skills, knowledge, and encourage them to stay; improve maternal health outcomes, improve performance and the quality of care in rural areas? How?

Then ask the manager of the health facility:

*What are the positive and negative consequences of (supportive supervision, in service training) on your staff, performance of your health facility, quantity and quality of provided maternal health services?

Then interview two midwives who have been recruited/receiving regular incentives but one of them decided to stay while the other decided to leave:

*Why did you decide to stay/leave the rural area/stop providing your services?

Then interview VMW who receives a one year programme:

*What skills have you gained from the basic training programme?

*What are the benefits of in-service training?

*How have the gained skills helped you in practice?

Then interview graduated nurse midwife from AHS who returns to her state/rural areas:
*How has the training you have received improved (your skills, knowledge and maternal health services in your area?).

*Interview general doctor who receives training programmes in EmOC:

*How has this training programme improved your skills and helped you to fill the gap of shortage of obstetricians?

Then select rural health facility where task shifting is implemented and interview the health facility manager:

*Why does task shifting work/not work in your health facility?

Then interview a health worker (doctor, medical assistant, midwife…) who is filling the shortage.

*How does the training programme improve your skills and help you to fill the shortage gap?

9.3.5. Interview guide for the Academy of Health Sciences

Two managers of the Academy of Health Sciences one from the federal and the other from the state level will be asked:

*How do the upgrading programmes improve the skills of Village Midwives VMWs?

*How do the upgrading programmes help in improving maternal health in rural and underserved areas?

*How do these training programmes enable the trainees to manage obstetric complications?

*What is the percentage of graduated midwives who return to their states/localities/rural areas?

*What are the main challenges?

*Why did some of the graduates not go back to their states/rural areas?

*How could we make the task shifting initiative more practical and successful?

*Could you show me any administrative reports that support what you have said?