EXPLORING THE EVOLUTION OF DEBATES ON ENVIRONMENTAL ASSESSMENT IN DEVELOPING COUNTRIES

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A song of ascents.

"[1] I lift up my eyes to the hills – where does my help come from?
[2] My help comes from the LORD, the Maker of heaven and earth.
[3] He will not let your foot slip – he who watches over you will not slumber;
[4] indeed, he who watches over Israel will neither slumber nor sleep.
[5] The LORD watches over you – the LORD is your shade at your right hand;
[6] the sun will not harm you by day, nor the moon by night.
[7] The LORD will keep you from all harm – he will watch over your life;
[8] the LORD will watch over your coming and going both now and forevermore."

Psalm 121

All honour and glory goes to my Heavenly Father, for without Him I could not have finished writing this mini-dissertation. The reason for choosing the above mentioned passage is that these words have always been with me since I have been a little girl. Everywhere I went and in everything I did, I used to lift my eyes up high and ask my Heavenly Father for guidance and support.

Secondly, I dedicate this mini-dissertation to my loving and supporting husband. He stood by my side during the good and difficult times and really encouraged me all the way. There were times when I was really stubborn, but then he would push me to go that extra mile. Thank you, Robbie; you're a man thousand.

Last but not least I would like to thank my supervisor, Dr. F. Retief for his guidance and support.

ABSTRACT

Environmental Assessment (EA) has been around for nearly half a century and is applied in more than a 100 countries worldwide. The uptake of EA amongst developing countries has produced extensive EA practice. However, amidst this wealth of practice there is a limited understanding of the academic debates and state of knowledge on EA in developing countries. In order to improve the application of EA in developing countries it is essential to focus on the debates surrounding the evolution of EA in these countries. From this the main ***Research Question*** arises – "What are the main academic debates on EA in developing countries?" In order to address the research question a comprehensive literature review study was conducted. This entailed using search words and conducting a search across a selected group of journals. The articles were then summarised using a set criteria. From this summary, the information could be divided into the selected main themes. The research concluded that the main themes of debate covered by the literature relates to the identity of EA, the application of EA and the performance of EA. It was found that due to the diverse nature of the literature no common 'golden' thread (or threads) could be identified and that the different contributions could be considered isolated. This implies that the EA literature is disjointed and reflects within different themes and not in relation to particular evolutionary debates as such. Distinctive evolutionary debates on EA in developing countries are thus limited. Finally proposals are made for future research that could enhance our understanding of EA in developing countries.

OPSOMMING

Omgewingsimpak-analise (OIA) is vir byna 'n halfeeu in gebruik en word in meer as 100 lande wêreldwyd toegepas. Ten einde die toepassing van OIA in ontwikkelende lande te verbeter en te verstaan, is dit nodig om te leer uit ondervinding. Ten spyte van die wye toepassing van OIA is daar tans 'n gebrek aan begrip oor die bestaande OIA kennis in ontwikkelende lande. Daarom is dit nodig om die bestaande kennis in die veld te ondersoek en om die hoof debatte oor tyd te analiseer. Vanuit hierdie perspektief spruit die navorsingsvraag naamlik: "Wat is die hoof akademiese debatte in sake OIA in ontwikkelende lande?" Om die navorsingsvraag te beantwoord is 'n omvattende literatuurstudie onderneem. Spesifieke soekwoorde is geidentifiseer wat dan op 'n geselekteerde groep joernale toegepas is. Die gevolgtrekking uit die navorsing is dat die hoof debatte oor OIA in die volgende temas verdeel kan word naamlik; identiteit van OIA, die toepassing van OIA en die effektiwiteit van OIA. Weens die uiteenlopende aard van die literatuur is daar geen 'goue' draad (of drade) geidentifiseer nie. Die verskillende bydraes is eerder geisoleerd met min sprake van geintegreerde debat. Dit sinspeel dat die literatuur onsamehangend is en ontstaan het uit verskillende temas en nie werklik 'n evolusie van gedagtes weerspieel nie. Die navorsing eindig met voorstelle om die begrip van OIA in ontwikkelende lande te bevorder.

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ABBREVIATIONS

DOE:	Department of Environment
EA:	Environmental Assessment
EARP:	Environmental Assessment and Review Process
ECA:	Environmental Conservation Act
EIA:	Environmental Impact Assessment
EIAR:	Environmental Impact Assessment Review
EIS:	Environment Impact Statement
EMS:	Environmental Management Systems
FAP:	Flood Action Plans
GEAP:	Gambia Environmental Action Plan
HIA	Health Impact Assessment
IA:	Impact Assessment
IAIA:	International Association for Impact Assessment
IAPA:	Impact Assessment and Project Appraisal
IEP:	India Ecodevelopment Project
JEAPM:	Journal of Environmental Assessment, Policy and Management
LCA	Life Cycle Assessment
NEMA:	National Environmental Management Act
NEMP-E:	National Environmental Management Plan for Eritrea
NEPA:	National Environmental Action Plan
PP:	Public Participation
PPP:	Policies, Programs and Plans
RA:	Risk Assessment
SD:	Sustainable Development
SEA:	Strategic Environmental Assessment
SIA:	Social Impact Assessment
SSI:	Social Science Index
UNESCO:	United Nations Educational, Scientific and Cultural Organization

CHAPTER 1: INTRODUCTION

This chapter aims to introduce the research and consists of five sections. In the first section the origin of Environmental Assessment (EA) is discussed together with an introduction to the different types of assessment, e.g. Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA). This then leads to setting the scene for EA debates in section two. The third section further explores the debate around the various forms of EA and as a result poses the problem statement and develops the resulting research question. The fourth section specifies the research objectives relating to the research question with the fifth section describing the structure of the mini-dissertation. This assists the reader to link the research objectives and research question to the methodology and chapters.

1.1 INTRODUCTION TO EA

EA has been one of the most successful policy implementation instruments to emerge over the last few decades. It can be applied at different stages of decision making from strategic level to project level. The application of EA potentially covers both the public and private sectors. Two main forms of EA emerged over the last two decades namely EIA (which is concerned with project level assessment) and later SEA (which is concerned with strategic level policy, plan and programme assessment).

EIA can typically be described as follows (Lee & George, 2006:1):

- To avoid, reduce and address any potential significant environmental consequence, which has been identified during the planning and design phase.
- To take all consequences into account during the planning and design phase of a project and when it is authorized.
- To influence the management of the implementation thereof.

SEA on the other hand emerged almost two decades after EIA, mainly in reaction to the limitations of project level EIA. *"SEA can cope better with*

cumulative impacts, alternatives and mitigation measures than project assessment." (Glasson *et al.*, 2005:23.)

Other more focused and 'specialized' forms of assessment have also emerged in recent times such as Social Impact Assessment (SIA), Life Cycle Assessment (LCA), Risk Assessment (RA), Health Impact Assessment (HIA), etc. It is important to note that the decision-making context determines the type of EA tool / process to be used. However, it is not the purpose of this mini-dissertation to clarify EA but merely to highlight that these different forms of EA exist and to what extent they are reflected in EA literature dealing with developing countries.

It is however useful as an introduction, to highlight what the author considers to be sound definitions. This will assist in distinguishing between EA as an umbrella term, EIA that focuses on project level decision-making and SEA, which is considered as an assessment at a strategic level.

EA is defined as:

> *"Environmental assessment implies the determination of the environmental consequences, or impact, of proposed projects or activities [which includes strategic level]. In this context, impact means change – any change, positive or negative – from a desirability standpoint. An environmental assessment is, therefore, a study of the probable changes in the various socioeconomic and biophysical characteristics of the environment which may result from a proposed or impending action."* (Jain *et al.*, 1993:5).

EIA can be described as:

> *"A technique and a process by which information about the environmental effects of a project is collected, both by the developer and from other sources, and taken into account by the planning authority in forming their judgments on whether the development should go ahead."* (Glasson *et al.*, 2005:3.)

SEA can be defined as

> *"A Strategic Environmental Assessment (SEA) makes an inquiry into the likely environmental changes (both positive and negative) resulting from the development produced by existing, new, or revised developmental policies, plans and programmes. SEA can be applied both at the level of broad policy initiatives, and to more concrete programmes and plans that have physical and spatial reference."* (Modak & Biswas, 1999:9).

1.2 SETTING THE SCENE CONCERNING THE ADOPTION OF EA INTERNATIONALLY

EA has been around for nearly half a century and is applied in more than a 100 countries worldwide (Wood, 2003:xvi). Modak and Biswas (1999:1) argue that the environmental movement stems from the first significant warning of the impact on the environment by mankind. This was made public when Rachel Carson published the book, "Silent Spring", in 1962, which dealt with the use of pesticides and the dangers thereof on the environment (Modak & Biswas, 1999:1).

This was followed by warnings on climate change and the impact carbon dioxides levels could have on the environment (Modak & Biswas, 1999:1). It was suddenly realised that human activities can have a significant impact on the environment. These activities need to be considered in any decision-making with regards to any development or project. The need to consider the environmental impacts of human actions and decisions was the main justification for the National Environmental Policy Act (NEPA) in the United States during the late 1960s. This initiated EIA as a compulsory environmental management tool.

Since then awareness has grown of the importance of the protection of the environment and the application of EA has expanded (Modak & Biswas, 1999:vii). This has led to the recognition of the complexity of the relationship between the environment and the development of policies, plans, programmes and projects.

EA developed slowly in the early 1970's mainly focusing on project level EIA in developed countries. During the early 1990s strategic level assessment also emerged in response to the limitations of project level assessment, and the term "SEA" was coined. The Rio Earth Summit in 1992 provided particular impetus and awareness of EA (Wood, 2003:336). Moreover the Earth Summit facilitated many countries to formally introduce EA as a mandatory legal requirement together with procedures on how to conduct EA.

1.3 PROBLEM STATEMENT AND RESEARCH QUESTION:

The general discussion seems to be that there has been a lot of EA practice in developing countries, but very little academic debate. The definition for "academic" as described by the Concise Oxford Dictionary (10th edition, 1999) is seen as *"...scholarly rather than technical or practical;... not of practical relevance"*. In this context it seems most of the theoretical and or published research seems to be more practical in nature rather than academic. However, this statement has not been explored empirically. For this reason the overall state of knowledge on EA in developing countries is unknown.

The Concise Oxford Dictionary (10th edition, 1999) defines "developing country" as follows: *"a poor agricultural country that is seeking to become more advanced economically and socially."* However the assumption was made for this study, that the authors in the literature have used a consistent definition and had a clear understanding of what the term "developing countries" entails. Therefore not much time was spent on the definition and it was assumed that consistency was therefore applied.

According to Lee and George (2006), EA is particularly important in developing country contexts for two reasons. Firstly their economies are mainly primary sector resource based and secondly the majority of biodiversity and pristine environments are located in developing countries.

In order to improve the theoretical grounding of EA it is essential that research be conducted on the debates surrounding the evolution of EA. This

will require looking at all forms of assessment, such as EIA and SEA. As an example Cashmore (2004:403) states that only if the EIA research agenda evolves and matures, can it be seen as globally significant, and then fulfil its potential.

It appears that there is currently a lack of reflection and understanding of the main debates in EA relating to developing countries specifically. It is obvious that in our effort to improve EA one should guard against redesigning the wheel and rather aim to build on existing knowledge.
Therefore the following ***Research Question*** arises.

"What are the main academic debates on EA in developing countries?"

1.4 SUB-RESEACH QUESTIONS

In line with the research problem and ***Research Question*** described above the aim is to map the evolution of debates on EA in developing countries with a view to consolidate existing knowledge. In relation to this the following ***Sub-research Questions*** can be identified:

Sub-research Question 1: What academic literature exists on EA in developing countries?
Sub-research Question 2: What common themes can be identified from the literature?
Sub-research Question 3: How have these themes evolved over time and how have they provided a perspective on the evolution of debates?
Sub-research Question 4: What is the geographic origin of the academic literature?
Sub-research Question 5: Who are the authors of these articles?

The outcome will provide a clear indication of the main themes of debates and where gaps in knowledge occur. This will enable the researcher to make recommendations for future research with these being discussed in the last chapter.

1.5 STRUCTURE OF MINI-DISSERTATION:

This mini-dissertation is divided into four chapters that are linked to the various ***Sub-research Questions***. This enables easy interpretation and understanding of the research and clearly demonstrates that the set research questions have been answered.

Chapter 1 provides an introduction to the research by presenting the problem statement and ***Research Questions. Chapter 2*** discusses the methodology used with a view to address the ***Sub-research questions***.

In ***Chapter 3*** the data analyses is presented in relation to addressing ***Sub-research Questions 1, 2, 3, 4 & 5***.

The final chapter presents the overall conclusion to the research and demonstrates that the overall ***Research Question*** - "What are the main academic debates on EA in developing countries?" - has been answered.

CHAPTER 2: METHODOLOGY

This chapter describes the methodology followed to address the overall research question, namely:

What are the main academic debates on EA in developing countries?

The chapter consists of four sections. The first section describes literature review as a distinct research method and why a literature review study was preferred for this particular study. The second section discusses the scope of the literature review, which focuses on the journals selected as the main source of information used. This then leads into the third section, which describes the literature search words used and the articles selected. A total of 74 articles were identified and analysed. On each selected article a process was followed as described in this chapter in order to capture the data necessary to answer the research question. The fourth section concludes the chapter and describes the method used to capture the data.

2.1 INTRODUCTION TO LITERATURE REVIEW AS A RESEARCH METHOD

Before the detailed methods used to conduct this study are described, it is necessary to first explore; *'What is a literature review?'* Many researchers see a literature review study as straight forward, but in many instances when the studies are reviewed, it is found that the literature review component is of particularly poor quality. Hart (2006:1) describes a quality literature review as containing *"appropriate breadth and depth, rigour and consistency, clarity and brevity and effective analysis and synthesis".*

Hart (2006:13) defines literature review as follows:

"The selection of available documents (both published and unpublished) on the topic which contain information, ideas, data and evidence written from a particular standpoint to fulfil certain aims or express certain views on the nature of the topic and how it is to be investigated, and the effective evaluation of these documents in relation to the research being proposed."

As the definition suggests it is a skill to be able to evaluate what a researcher has found. What is even more difficult is the ability to analyse the information and thereafter put arguments forward as to the validity or not of the researchers' ideas and postulations. It is also imperative to ensure the writing is *"clear, consistent and coherent"* (Hart, 2006:10). Hart (2006:10) further eludes that without this, a literature review can be meaningless resulting in the information being used incorrectly and misinterpreted.

The researcher should also be aware that although the topic might be clear to the researcher, when the reader tries to analyse the topic they could be totally lost and confused. Other aspects, which might confuse the reader, can be the *"unfamiliarity with the style, presentation or language use"* in the research (Hart, 2006:10). The time factor also needs to be considered. If not enough time is allocated to read the article and make the effort to understand the topic wrong interpretations can be concluded. Diversity can also be a problem, for the research normally consists of a broad spectrum of information and the researcher then needs to be open-minded and flexible. A good literature review therefore needs to consist of a description on how the research was done, the reason for it being done and the various outcomes of the choices made as to the interpretation of the article (Hart, 2006:11).

In addition to the above it is essential that the reader understand the effort the researcher has made as well the reasons why there could be a lack of preciseness. Hart (2006:11) describes that it can take a lot of effort and time to express the ideas in writing, and as there are limitations on space or word counts it can result that the message is not carried over properly.

The following section discusses the scope of the literature review conducted for this research.

2.2 SCOPE OF THE LITERATURE REVIEW

The researcher did not cover the entire body of literature on EA since this would have been unviable due to time constraints. It was therefore decided to focus on particular academic sources namely published journals. Only articles published in the following journals were assessed as it was felt that these would adequately cover the scope of the topic:

- Environmental Impact Assessment Review (EIAR);
- Impact Assessment and Project Appraisal (IAPA); and
- Journal of Environmental Assessment and Policy and Management (JEAPM).

The reasons for choosing these journals are as follows:

- EIAR – This journal is a refereed and interdisciplinary journal. It has a broad base international audience including practitioners, policy-makers and academics. *"This audience assesses the environmental impact of policy, projects, processes and products and makes decisions based upon these assessments"* (Thomson Scientific, 2007). It also focuses on work that is innovative, and topical. This journal is listed on the Social Science Index (SSI).

- IAPA – Is a peer reviewed, international journal published by the International Association for Impact Assessment (IAIA). It covers a broad audience (e.g. universities, government and public agencies, consultancies, NGOs etc.) and is presented in more than 100 countries. It promotes a broad range of articles focusing on areas such as environmental, social, health and other impact assessments (IA). Other areas also included are *"cost-benefit analysis, technology assessment, and other approaches to anticipating and managing impacts"* (Page, 1997).

- JEAPM – This international journal is interdisciplinary and peer reviewed covering policy and decision-making related to EA. *"Its specific aim is to explore the horizontal interactions between assessment and aspects of*

environmental management" and *"thereby to identify comprehensive approaches to environmental improvement involving both qualitative and quantitative information"* (World Scientific Publishing, 2007). This journal is also listed on the SSI.

In addition to the above, these journals are all considered leading academic journals. By choosing only these three journals, it allows boundaries to be set in terms of the data-gathering component of the research and avoids the extent of the research becoming too wide.

2.3 SEARCH WORDS

For the purpose of this research, it was decided to use the following string of search words in obtaining data for the literature review – ***'environmental assessment in developing countries'***. The reason for choosing these words was that the researcher thought it would be broad enough so that no information would be missed. It would also ensure that the researcher would be sufficiently focused within the broader EA context.

Other options were also investigated, e.g. to break up the search words in single phrases especially in the beginning when difficulty was experienced in obtaining data. Phrases used were 'developing countries' and 'environmental assessment'. However, it was found that these provided a too broad spectrum of papers that did not fit the particular focus of the research. In the end the researcher decided to stay with the original search words / phrase of ***'environmental assessment in developing countries'***.

The articles found using the search phrase allowed the researcher to determine to what extent academic research has been done on this specific subject. This research includes contributions made by academics, practitioners in consultancy, private industry, government and multi-lateral institutions. It was felt that the use of the umbrella term EA would suffice since it would imply inclusion of all other types of assessment. However it was also felt not to target the search for different geographical areas. In the end the outcome justified the latter decisions since the search indeed produced an

overview of a broad range of assessment types as well as coverage of different geographic areas.

The following search engines available on the Internet were used, which resulted in a better sample of information obtained.

- EBSCOhost
- ScienceDirect
- IngentaConnect
- World Scientific

By using the previously described search words, it ensured consistency of the data obtained, together with the certainty that all information was scrutinized using the same criteria.

It was also seen that when entering this phrase 'as is' in the search option of the search engine without italics before and after the search words more articles where found than when putting the search words within italics. It was found that the search engines break down these words and search for the words separately.

Using these search words a total of 83 articles were identified but surprisingly nine articles dealt with developed countries and had to be excluded from the sample. The final sample consisted of 74 articles.

It was also quite apparent that more articles were published in IAPA than in the other two journals. It is postulated that seeing that IAPA was published by IAIA a broader audience was reached and thus more articles dealing with developing countries tend to be published in this journal.

2.4 DATA CAPTURING AND ANALYSIS

An Excel Spreadsheet was compiled which served as a register. See ***Appendix A*** for more detail. It captured the following information:

- Article Number (A number given to the article by the researcher to make tracking easier.)

- Name of Article
- Author
- Journal (To distinguish between EIAR, IAPA and JEAPM.)
- Published Date
- Theme (Identity of EA, Application of EA and Performance evaluation.)
- Sub theme (Sub themes as per themes.)
- Country
- Initiator (This indicates from which institution the author originates, e.g. University, Consultant, Financial Institution, Government, etc.)

From this spreadsheet various worksheets were created within the main spreadsheet that enabled the researcher to analyse the data. Methods for sorting the data related to the theme, sub theme and publication date of the articles. This enabled the researcher to compile a time line. See ***Diagram 1*** in ***Chapter 3*** for more detail.

A filter was place on the spreadsheet, which also enabled the researcher to sort the data according to the various countries and institution to which the initiator belonged. More information was then added to be able to determine which country the initiator represents. This enabled the researcher to see whether the initiator came from the same country the research was conducted on. The analysis on this is discussed in ***Chapter 3*** and illustrated on ***Graph 1, 2 and 3***.

CHAPTER 3: RESEARCH RESULTS AND ANALYSIS

This chapter presents the research results and aims to address the following ***Sub-research Questions***:

Question 1: What academic literature exists on EA in developing countries?
Question 2: What common themes can be identified from the literature?
Question 3: How have these themes evolved over time and how have they provided a perspective on the evolution of debates?
Question 4: What is the geographic origin of the academic literature?
Question 5: Who are the authors of these articles?

This chapter includes six sections. The first section deals with an introduction to the main themes of the research therefore addressing ***Sub-research Question 2***. Debates are mapped and summarized in the second section by means of an illustration to indicate when research started and how it evolved in developing countries - answering ***Sub-research Question 3***. This followed by the third section dealing with EA debates in respective developing countries – addressing ***Sub-research Question 1***.

The fourth section describes the main themes and sub themes emanating from the literature – continuing addressing ***Sub-research Question 2***.

Section five discusses the geographic origin of the articles to answer ***Sub-research Question 4***. ***Sub-research Question 5*** is answered in section six which deals with the origin of authors in relation to the topic of the articles.

3.1 INTRODUCTION TO MAIN THEMES:

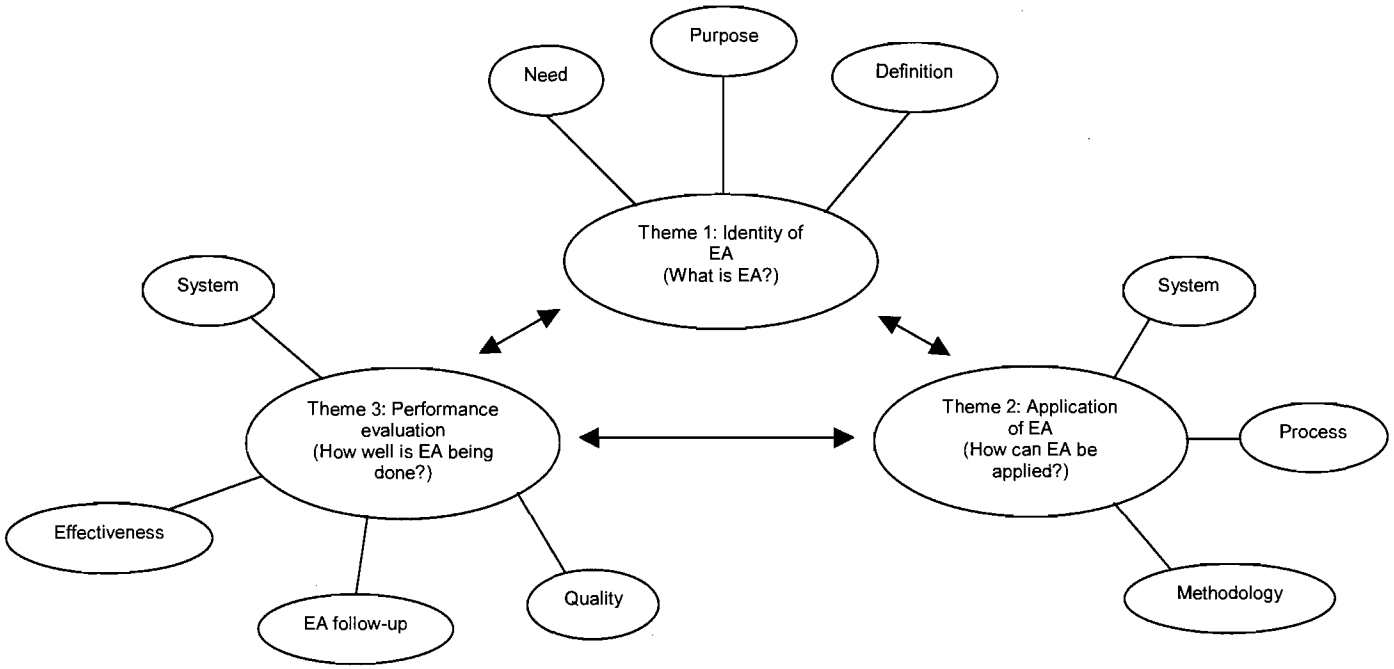
This section discusses ***Sub-research Question 2*** on the common themes identified in the literature.

It was decided to build on international EA themes already explored in previous studies as described by Kidd and Retief (2007). This provided initial direction and enables comparison between developed and developing countries for future research. As already explained in ***Chapter 2***, this research focuses on the debates on EA in developing countries.

The themes of debate are as follows – as illustrated in ***Figure 1*** (Kidd & Retief, 2007):

- Theme 1: Identity of EA
- Theme 2: Application of EA
- Theme 3: Performance evaluation

FIGURE 1: THEMES FOR DEBATE IN EA (KIDD & RETIEF, 2007)



As seen in the ***Figure 1***, the *'Identity of EA'* can be divided into what is the need for EA, what is its purpose and how can it be defined. The main question explored by scholars in the field was *'What is EA?'*.

The second theme is *'Application of EA'*. This can be defined as *'How can EA be applied?'* and is described in relation to the system, process and methodology used in the process.

The last and third theme relates to *'Performance Evaluation'* asking *'How well is EA being done?'*. Sub-themes would include the performance of EA systems, the quality of EA and the effectiveness of EA.

However, although the three main themes provide a first step towards unpacking the areas of debate it is evident that they are also cross cutting. The understanding of the identity of EA (theme 1) invariably influences our views on whether EA has been effective (theme 3) and what the best EA methods would be (theme 2). Therefore one theme should not be considered in isolation but rather the interconnectedness should to be acknowledged.

3.2 MAPPING OF DEBATES

As a first step towards gaining a better understanding of EA debates a timeline is required which illustrate the evolution in EA thinking. This section alludes to the mapping over time of themes and sub themes identified for the various articles, with a view to address ***Sub-research Question 3***.

Diagram 1 was compiled using the information from the spreadsheet (see ***Appendix A***). This information is a summary and a register of the 74 articles identified. A filter was used to sort the data according to the following themes, sub themes as well as publication dates.

- Identity
    - Definition
    - Purpose
    - Need
- Application
    - Methodology
    - Process
    - System

- Performance
  - System
  - Effectiveness
  - Follow-up
  - Quality

DIAGRAM 1: NUMBER OF ARTICLES PER YEAR PER THEME AND SUB-THEME

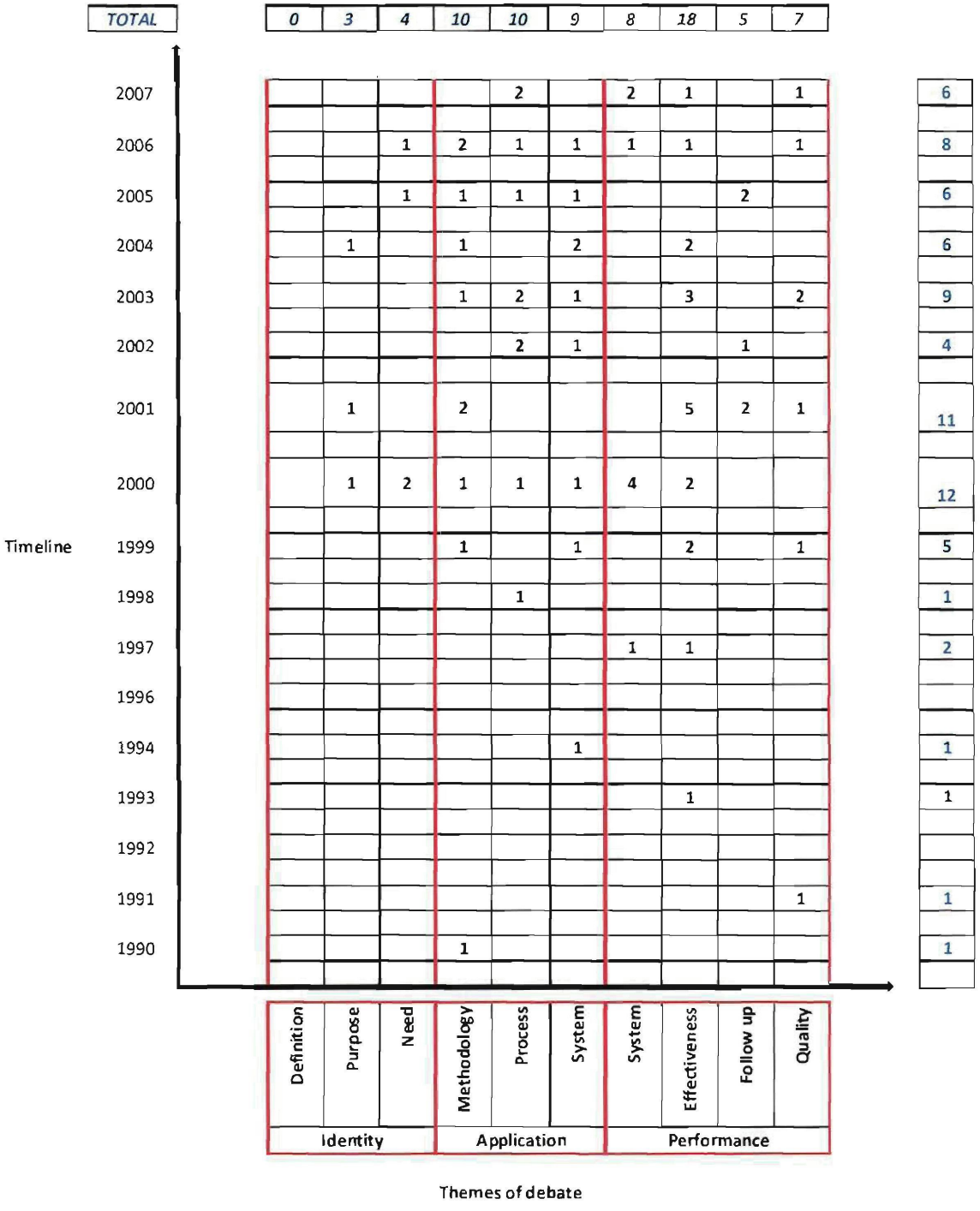


Diagram 1 shows the number of articles written per theme and sub theme. It also provides the total number of articles written per year. It is clear from this diagram that the most research was conducted in the Sub-theme – Effectiveness (Performance). The second largest category of research was in the Sub-theme – Methodology (Application) with a large number of case studies found to describe how EA have been implemented in the various developing countries. This seems slightly contradictory to the outcome of work done by other authors, which suggest that the majority of EA literature deals with methods of EA and how to apply EA and less dealing with how effective EA has been (Kidd and Retief, 2007). It thus seems as if the emphasis for developing countries specifically leans more towards the effectiveness theme asking – what are we achieving and how effective is EA?

As illustrated in the diagram no articles could be found that had been written before 1990. An explanation could be that legislation for EA in developing countries only emerged in the 1990s and therefore EA had not really been accepted in these countries before that time. Limited opportunities for research thus existed resulting in very few articles being written if any. Also very few developing countries actually conducted the research locally as most authors of the research are based in developed countries. This will be discussed in more detail in ***Section 3.6*** when looking at the background of the authors writing these articles.

It is also clear from the timeline that quite a bit of research was done around 2000 – 2001 and then the interest in EA research seemed to fade. One explanation could be that international events such as the World Summit on Sustainable Development (WSSD) in 2002 initiated research during 2000-2001, although this would be difficult to establish with certainty. The themes and sub-themes will be discussed in further detail in ***Section 3.4***.

3.3 EA DEBATES WITHIN DIFFERENT DEVELOPING COUNTRIES:

It was decided to have a closer look at the developing countries mentioned in the various articles in the research and to see which themes have been covered in these countries. This section will enable the researcher to address ***Sub-research Question 1***, which relates to the existence of academic literature on EA in developing countries.

Table 1 is a summary of the information found on EA in developing countries from the research conducted. The majority of articles gave a description of the particular EA system and whether EA had been legalised. This table summarizes this data together with the number of articles written for the respective countries and the number of articles per theme.

TABLE 1: SUMMARY OF INFORMATION FOUND ON EA IN DEVELOPING COUNTRIES.

COUNTRIES	VOLUNTARY INTRODUCED	LEGALISED	NUMBER OF ARTICLES WRITTEN	THEMES
ASIA			*4*	*2xA, 1xI & 1xPE*
Azerbaijan & Turkmenistan			1	1xA
Bangladesh	1970	1992	2	2xPE
Hong Kong	1977	1996	2	2xPE
India	1986	1994	4	2xA & 2xPE
Indonesia	1982	2000	2	2XA
Lebanon			1	1xA
Malaysia	1970	1987	2	1xA & 1xPE
Maldives	1985	1993	1	1xPE
Philippines	NDA	1992	1	1xPE
Russia			1	1xA
Sri Lanka	1980	1993	1	1xPE
Thailand	1986	1992	2	1xA & 1xPE
Uzbekistan	NDA	2000	1	1xPE
Vietnam	1984	1994	3	2xA & 1xPE
AFRICA			*1*	*1xI*
Cameroon	NDA	1996	2	1xA & 1xPE
Eritrea	NDA	1995	1	1xPE
Gambia	NDA	1994	1	1xPE
Ghana			1	1xPE
Sierra Leone	NDA	NDA	1	1xA

South Africa	NDA	1997	5	2xA & 3xPE
AUSTRALIA & OCEANIA				
Fiji	1980	1998	1	1xPE
LATIN AMERICA			*1*	*1xA*
Brazil	NDA	1986	1	1xPE
Chile	NDA	NDA	1	1xPE
Mexico	NDA	NDA	1	1xPE
DEVELOPING COUNTRIES IN GENERAL			***29***	***11xA, 5xI & 13xPE***

Note: NDA – No date available in the articles.

I – Identity

A – Application

PE – Performance Evaluation

The following sub-sections look at the types of research conducted in the respective countries as summarised in ***Table 1***.

3.3.1 Asia

The research results covered the following countries - discussed in this section:

- Azerbaijan and Turkmenistan
- Bangladesh
- Hong Kong
- India
- Indonesia
- Lebanon
- Malaysia
- Maldives
- Philippines
- Russia
- Sri Lanka
- Thailand
- Uzbekistan

- Vietnam

3.3.1.1 Azerbaijan and Turkmenistan

One article was found which included both these countries and focused on oil field developments in the Caspian Sea (Nazari, 2003:441). These case studies in the article highlight the potential impact unmitigated oil spills may have and the transboundary impacts thereof. It was clear from the case study that the countries involved had limited capacity to get involved if transboundary activities should occur. They also lacked commitment to the Espoo Convention (Nazari, 2003:441). Nazari (2003:442) also investigates opportunities on how to strengthen management and how to promote the use of the Convention. It is concluded that this particular paper explored the performance of the EA system and ways of improving effectiveness.

3.3.1.2 Bangladesh

Two articles were written on the practice of EIA and the incorporation of SIA in Bangladesh. These articles were written in 2003 and 2004 respectively. The one dealt with the incorporation of SIA into the process of EIA. The reason why Momtaz (2003:132) conducted this study was to see how environmental consequences would affect the public. In addition it was essential to see how to improve the positive impacts and to avoid the negatives impacts. Although both articles could also be considered under theme 2, particular emphasis was placed on understanding if EA is contributing – and therefore grouped under theme 3, performance evaluation.

The second dealt with the evolution of EIA in Bangladesh together with the discussion of EIA case studies as well as to determine what support structures are in place (Ahammed & Harvey, 2004:63). Ahammed and Harvey (2004:75) provide some recommendations on how to improve EIA in Bangladesh seeing that it is still a relative new process in a country that has so many demands. These demands are often at cross purposes to each other and would include a growing population versus pressures on resource management and a vulnerable environment.

3.3.1.3 Hong Kong

Two articles was written on Hong Kong and focused on the evaluation and implementation of EIA. It was only in 1996 that a Bill was published on EIA that required all new developments and projects to be subjected to EIA before any project progress could be made. Wood and Coppell (1999:21) reviewed this EIA process in Hong Kong and wanted to find means of improving it.

This new ordinance has assisted with better EIA's being conducted, but Hong Kong still needs to be careful that if proper EIA's are not conducted environmental degradation can occur as has happened in some other Asian countries. It still needs to focus on public participation, awareness of the environment as well as political issues and the incorporation thereof in the EIA process. Wood and Coppell (1999:30) concluded that the Hong Kong EIA system is of a world standard and is similar to those used in developed countries.

In the second article, Lo and Yip (1999:355) focused on EIA regulation in Hong Kong and Shanghai. In their study they compared the two systems with each other. In Shanghai, EIA takes place formally whereas in Hong Kong it occurs informal. It is dominated by the environmental agency in Shanghai, which regulates *"informal politics in the EIA process within the legal format"* (Lo & Yip, 1999:355). Whereas in Hong Kong, the environmental agency seeks to actively cooperate with their clients in a consultative manner when dealing with EIAs. Lo and Yip (1999:355) stated that the EIA system of Hong Kong is superior to Shanghai system and that they make use of institutional channels for public consultation. They are also more transparent than Shanghai.

3.3.1.4 India

A total of four articles were found published in 2001, 2002, 2003 and 2006 respectively.

In the first article written by Rajvanshi (2001:373), he focused on the experiences, prospects and lessons learnt from applying SEA on the India Ecodevelopment Project. He suggested that SEA should be made mandatory by just amending the EIA legislation. This will ensure that projects will not go ahead which can result in irreversible damage to the environment. Rajvanshi (2001:389) continues to say that EIA needs to have an integrated approach with SEA. A typical example will be India, which is so populated that it is imperative that the goals for economic development and conservation should be met, in reality this seldom happens.

The second topic focused on was how an integrated assessment model could be used for cross-country pipelines. Normally IA are conducted which are used to justify the selection and results in approval of the optimum technical alternative. This article focused on developing a model to address the alternative sites being suggested and the consequences thereof which then could result in the technical and financial analysis later being revised (Dey, 2002:703).

In the third article written by Rajvanshi (2003:317) he described how India realised the importance of Public Participation (PP) as part of the EIA process. PP was made compulsory when the Public Hearing Notification Act was promulgated in 1997. The objective was to strengthen the public involvement and thereby assist with the EIA process. He further looked at the importance of having a proactive participation process.

The fourth and last article researched, was on the clearance procedure used in India and focused on the example of the Sethusamudram Ship Channel Project. A lot of protest was received from the public but the Government still went ahead in clearing the project. Rajaram and Das (2006:115) suggested that the clearance procedure needed to be modified and should include the role the public plays in decision-making. This will bring it closer to Sustainable Development (SD).

3.3.1.5 Indonesia

Two articles were found to having been written on Indonesia. McGranahan *et al.* (1998:505) investigated the importance of neighbourhood conditions, especially the role it played in urban environmental management where services are lacking. The article continued discussing three models, which could be used to assess environmental problems in low income communities. These methods were:

- Household surveys,
- Participatory rapid assessment, and
- Contingent valuation.

From this article it was clear that the above mentioned methods provided insight which is essential to make decisions for future development. *"In the end there is no substitute for sound judgment, good practice and the active support of good governance, whichever technique is used to understand the environmental problems of deprived neighbourhoods."* (McGranahan *et al.*, 1998:517.)

In the second article, Purnama (2003:415) discussed how EIA has been reformed in Indonesia and the involvement the public now have in the process. A new regulation was introduced in 2000 in Indonesia to address public participation in the EIA process and this resulted in the articles written on Indonesia.

Purnama (2003:415) hoped to achieve through his article that the lessons learnt from Indonesia will be implemented in other developing countries. He continued in saying that it was realised that public participation was quite significant and a big challenge for developing countries. Indonesia needs to ensure that the process is implemented correctly and that assistance should be gathered from all stakeholders. Currently there is not a formal process in place for all aspects of the EA system and thus a culture of formal participation needs to be established (Purnama, 2003:437).

3.3.1.6 Lebanon

One article was found discussing the implementation of SEA in Lebanon. Chaker *et al.* (2006:103) indicated that the *"Government of Lebanon is among the pioneers"* when it comes to the implementation in SEA. In this case study Chaker *et al.* (2006:103) made some recommendations in the following areas:

- Financial
- Regulatory
- Institutional
- Participatory Approach

These could be used by other developing countries in implementing SEA successfully.

3.3.1.7 Malaysia

The two articles on Malaysia focused on the EIA legislation, the problems and perspectives experienced and the movement towards SEA respectively. Nor (1991:129) described the Environmental Impact Statements (EISs) as project-based, and the problems if the focus was on the impact of the implementation of the project and not on looking at alternatives as well.

The next focus area in Malaysia was on the movement towards SEA and the incorporation of it in EIA studies. Briffett *et al.* (2004:221) described the many problems that still occur in the EIA process in Malaysia even though it is still used with a commitment towards SEA.

3.3.1.8 Maldives

Only one article has been written on the Maldives. Annandale (2001:187) focused on the development and evaluation of EIA systems. He then used Wood's (1995) criteria and compared it to the EA system in Maldives. Annandale (2001:193) suggested that not all the criteria are equally valid to the Maldives system and that additional and context specific criteria are required to gauge EA in small developing countries.

3.3.1.9 Philippines

For the Philippines one article was found. Cooper and Elliott (2000:340) indicated *"the Philippines were the first developing country to introduce EA into the planning process"*. In 1992 regulations were introduced and in 1996 amendments were made to strengthen the process.

Cooper and Elliott (2000:364) conducted some research on the public participation process in the Philippines. They stated that public participation plays an important role in the Philippines and occurs mainly in the pre-approval stages. The important lesson learnt was that an even representation of all the groups involved should be present. This article also shows that conflict exists in the communities and therefore it is so important to involve the public in the developing processes (Cooper & Elliott, 2000:339).

3.3.1.10 Russia

One article was published which focused on a case study based on the logistics of an oil refinery in the North Atlantic. Here the application of EIA was clearly illustrated on how best available technology can be used to reduce the environmental impacts (Sólnes, 2000:309).

3.3.1.11 Sri Lanka

One article was found dealing with Sri Lanka. It found that although EIA practices are in place in Sri Lanka, the environment is still deteriorating. The reasons described include a lack of monitoring control, enforcement to ensure mitigation measures not being in place and a lack of environmental management plans (Mackee *et al.*, 2001:210). EA in Sri Lanka is still seen mainly as a way for obtaining approval for projects and not as a way *"to improve the quality of the development and the environment"* (Mackee *et al.*, 2001:211).

Mackee *et al.* (2001:236) further describes that SEA has been seen as a possible solution to strengthen EA. Incorporating environmental protection measures with their policies, programmes and plans can do this. Sri Lanka may experience difficulty in implementing SEA mainly due to the unstable political environment, which could be translated into a lack of political commitment to pursue environmental policies (Mackee *et al.*, 201:237).

3.3.1.12 Thailand

Two articles were identified. The first one is based on a case study on the electricity generating authority dealing with their organizational change and the use of EIA (Shepherd & Ortolano, 1997:329). The second deals with spatial analysis of social impacts of the Eastern Seaboard Development Programme (Indhapanya *et al.*, 1999:203).

The first article discussed the implementation of EIA regulations in companies and the importance of leadership commitment of the organization towards the implementation thereof. An example was the Electricity Generating Authority of Thailand (EGAT) where the influence of leadership, political entrepreneurship and organizational change made a huge difference to the implementation of EIA. Other factors that played a role were: the involvement of the World Bank, vocal environmental groups and legislation enforced by the government of Thailand (Shepherd & Ortolano, 1997:353).

Indhapanya *et al.* (1999:203) stated that although EIA has been practiced in Thailand for nearly two decades it still has not *"fully included nor integrated SIA" into its EIA system*. It is essential for developing countries to select methods and techniques to conduct SIA that are appropriate for their country. Most times the knowledge and expertise isn't always available as these techniques from the developed countries do not always have relevance for developing countries (Indhapanya *et al.*, 1999:203).

Indhapanya *et al.* (1999:215) concludes highlighting the importance that all parties are involved in projects and that SIA is fully integrated with EIA when determining significant environmental impacts on projects.

3.3.1.13 Uzbekistan

One article was written wherein Khusnutdinova (2004:170) has conducted Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis on the EIA system in Uzbekistan. It was concluded that for the EIA system to work it needed further development for at the moment it is still very socialistic orientated. The Government is in the process of improving the EIA system together with involving qualified national and international experts in the field of EIA. This will assist in creating a more sustainable future for Uzbekistan (Khusnutdinova, 2004:171).

3.3.1.14 Viet Nam

Three articles capture EIA in Viet Nam of which Doberstein wrote two. Both his articles deal with EIA capacity building. The first article reviews the achievements and disappointments of the EA legislation in Viet Nam together with the implementation of SEA in the future. A lot of successes and failures exist. Some of these failures are due to a lack of knowledge and expertise in this field whilst other problems experienced arise from constraints associated with the political, legal and social factors (Obbard *et al.*, 2002:268). SEA has definitely a sustainable future in Viet Nam, but on condition that clear guidelines are established to achieve the results (Obbard *et al.*, 2002:293).

Secondly Doberstein (2003:25) focus on how EIA roles have changed and how EIA capacity has emerged in Viet Nam. Doberstein (2003:25) discusses the efforts by development aid agencies on EIA capacity building together with the limits of the effectiveness of EIA in Viet Nam. It is clear that Viet Nam has unmet EIA capacity-building needs and it is essential to share a *"'vision' for EIA amongst development aid agencies and Vietnamese development planners"* (Doberstein, 2003:25). He then focused on a *"mechanism to harmonize EIA capacity-building efforts with such a vision"* (Doberstein, 2003:25).

The last article focused on the lack of empirical research being done on *"development aid agencies as 'agents of change' in environmental impact assessment (EIA) systems in developing countries"* (Doberstein, 2004:283). Doberstein (2004:283) examined the model of environmental planning practice together with EIA capacity building and the opportunities to transform the development planning processes of developing countries.

3.3.1.15 Summary for Asia

From the above examples of countries discussed for Asia, it was clear that a variety of topics were covered. This included the following:

- EIA legislation development,
- EIA application,
- SEA application,
- Incorporation of SIA and SEA with EIA,
- The improvement of the respective assessments and
- Public Participation.

3.3.2 Africa

The following countries are discussed in this section:

- Cameroon
- Eritrea
- Gambia
- Ghana
- Sierra Leone
- South Africa

3.3.2.1 Cameroon

Two articles were written to discuss EIA in Cameroon. The first dealt with the *"legal and institutional framework and the practice of environmental assessment (EA)"* (Bitondo, 2000:33). The unfortunate aspect regarding the practice of EA in Cameroon; is that it is still not effective and a lot of work still needs to be done to improve this (Bitondo, 2000:41). Cameroon is a

struggling country and therefore needs to focus on the most important issues to be able to survive. The EA system needs to be as simple as possible to make it work.

Secondly the focus is on the institutionalization of EA in Cameroon. This is a process by which EA evolves as a sustainable tool (Bitondo & André, 2007:139). An example is given where this process is applied to a road development. It is concluded that *"good governance and environmental values need to be inculcated into the national culture"* to promote the concept of sustainable development (Bitondo & André, 2007:147).

3.3.2.2 Eritrea

The only study, which could be found, was conducted by Zeremariam & Quinn (2007:61). They used the evaluation criteria of Wood (2003) to discuss EIA in the country and to see where improvements could be made for the future. Improvements suggested were concerning the following areas: legal requirements, resources, the decision making process, the use of EIA and the capability for using programmes, plans and policies. Other reasons for not applying EIA can be as follows:

- Limited knowledge and awareness of environmental issues,
- Development pressure,
- Cost of implementing an EIA,
- Skill shortage, and
- Political issues.

The above issues need to be addressed to be able to improve EIA in Eritrea (Zeramariam & Quinn, 2007:61). This can then be taken forward and implemented in other developing countries that experience similar problems.

3.3.2.3 Gambia

Only one article was found focusing on the Gambian experience in implementing EIA (Kakonge, 2006:57). Although the EIA process is used, Kakonge (2006:63) suggested that it still needs improvement. The suggestions were:

- Donor support needs to be increased to assist with technical advice as well as internal and locally driven changes aimed at delivering high quality EIA reports.
- Functions like monitoring and auditing will need to be strengthened.
- Training, awareness and knowledge are essential to enhance the process.

These are only a few aspects and once addressed may create more financial assistance that is currently not readily available for (Kakonge, 2006:63).

3.3.2.4 Ghana

Only one article was written on EIA in Ghana and published in 2001. The main focus was to improve the EIA process with the knowledge gained from the study. The author documented that most developing countries adopt EIA procedures from Western Europe and North America (Appiah-Opoku, 2001:59).

Appiah-Opoku (2001:60) expands that the issue is rather *"how to operationally incorporate EIA in planning, management and implementation of development projects in developing countries"* rather than the incorporation of environmental considerations.

Appiah-Opoku (2001:70) concludes that the community needs to be involved. It is important to gather local knowledge of the area. The only way of achieving this is through the local community. It is also important to take note of the various generations and to understand their indigenous knowledge and its significance for future generations.

3.3.2.5 Sierra Leone

For Sierra Leone only one article was published in the sample taken at the time of the research. This article was written by Tengbe (2001:783) in regards to the simulation modelling in resource management and its ability to achieve sustainable development. This natural resource management model captures *"the economic, social and ecological variables that influence resource management"* (Tengbe, 2001:783).

Tengbe (2001:783) then continues in analysing three policy approaches, which is available to government in regulating national development. This is applied to mining activities. These approaches are (Tengbe, 2001:783):

- The conservative policy approach,
- The radical policy approach, and
- The harmonious policy approach.

He concludes that the model developed could be applied to other case studies but should be adjusted according to the project for it was mainly developed for the mining industry of Sierra Leone (Tengbe, 2001:801).

3.3.2.6 South Africa

A total of five articles have been written and published for South Africa. These were the most articles written for any of the developing countries. The topics varied from administrative capacity, follow-up status, environmental economic valuation, and performance evaluation to the use of EIA during project execution phases.

The first article focused on EIA capacity and follow-up in South Africa (Duthie, 2001:215). This article was written and published in 2001 when the EIA regulations had just been introduced in 1997. EIA follow-up was born from the need to gauge to what extent EIA has been implemented and monitored. This particular paper considered the capacity available in the various provinces in South Africa to implement and regulate the new EIA regulations (Duthie, 2001:215).

The following conclusions were made with regards to staff, other resources and external factors (Duthie, 2001:221):

- The screening process for EIA applications is not done effectively.
- The authorities gave a high number of exemptions from the EIA process.
- Lack of basic resources for example computers, transport and office equipment exist.
- Applications are of poor quality.

The next article focused on whether follow-up is done on EIAs. Hulett and Diab (2002:298) note that there is a lack of follow-up in EIA throughout South Africa but that this is also a worldwide trend. They indicate that much research has already been done on this subject and that it is important to note the following components of follow-up. These components are (Hulett & Diab, 2002:298):

- Monitoring
- Auditing
- Evaluation
- Management
- Communication

Following from this discussion by Hulett and Diab (2002:298) four models were discussed and are as follows (Hulett & Diab, 2002:303):

- Legal-based approach,
- Partnership approach,
- Self-regulatory approach, and
- Incentive or disincentive approach.

From the study it was concluded that the partnership approach could be the way forward due to the fact that it satisfies most of the sustainability principles (Hulett & Diab, 2002:303).

In the third article, Crookes and de Wit (2002:127) explore *"the use of economic valuation as a tool for integration with EAs"*. Economic valuation is a tool, which has already been established and is used to determine the value

of environmental impacts. Therefore it is seen that such integration into EA's could add value to the EA process. It is clear from the study that this seldom occurs. Some arguments as to why this technique has limited use can be described as follow (Crookes & de Wit, 2002:133):

- The practice of economic valuation has developed to a point where it can't be used. BUT
- The practical inclusion of an environmental economic assessment after biophysical impact studies is often derided by the problems of time and budget.

The fourth article, Retief (2007:85) describes South Africa as the leading developing country in terms of SEA in the international arena. This research focuses on the quality of SEA in South Africa and is described by means of three models (Retief, 2007:84).

These three models are, *"'stand alone', 'central to decision making' and 'integrated' models"* (Retief, 2007:84). This is used to describe the way SEA's are performed and the quality thereof. From the results it is clear that after seven years of implementation of the SEA guidance document there is still no clear understanding of the meaning of SEA. There is also little understanding of the strategic decision making process as well as the political content (Retief, 2007:98).

The current international debate is that SEA should be *"stand alone"* where the feeling is that it should be more *"flexible and integrated"* (Retief, 2007:98). It is concluded that to be able to improve the quality of SEA and therefore EA, the effectiveness and follow-up process should improve and only then could these environmental tools add value.

In the last article in this section, Brent and Petrick (2007:111) looked at project management and the use of EIA. EIA is normally conducted on all projects in the *"raw materials processing industry of the South African energy sector"* (Brent & Petrick, 2007:111). It was released with this study that the EIA regulations in South Africa do not take project management models and practices into consideration. Their research investigated the route taken to

conduct an EIA in relation to the lifecycle phases of project execution (Brent & Petrick, 2007:111). Brent and Petrick (2007:121) indicated that further research need to be done to evaluate such a model including EIA and project lifecycle assessment (Brent & Petrick, 2007:121).

3.3.2.7 Summary for Africa

For Africa a variety of topics are covered by the literature. These included the following:

- EIA legislation development,
- EIA application,
- SEA application,
- Follow-up status and Performance evaluation and
- The use of economic evaluation.

3.3.3 Australia & Oceania

For this region only one country will be covered which is Fiji.

3.3.3.1 Fiji

Only one article was found to be written for Fiji and it was published in 2003. This dealt with EIA in Fiji. Turnbull (2003:73) stated that Fiji *"is not serious about using EIA to control environmental quality"*. There are a lot of technical shortcomings in the EIA system in Fiji and these needs to be addressed. If one looks at other developing countries, research indicates that the adoption process of EIA in Fiji specifically has been very slow. This is attributed to a variety of reasons. Examples are, *"technical issues, citing shortcomings in legislative, administrative, institutional, and procedural matters"* (Turnbull, 2003:86).

It is essential to address these issues otherwise environmental degradation will increase. It is also concluded that there should be a better understanding of socio-political and socio-economic dynamics and once this is achieved and incorporated into the process of EA the quality of EA can be improved.

3.3.3.2 Summary for Australia and Oceania

Only one topic was covered and dealt with EIA application.

3.3.4 Latin America

The following countries are discussed in this section:

- Brazil
- Chile
- Mexico

3.3.4.1 Brazil

The only article found on Brazil discussed the gap that exists between procedures and practice. Glasson and Salvador (2000:192) stated that EIA systems vary from country to country and can take many forms, e.g. regulations, EIA guidelines, etc. They also continue to conclude that EIA is applied differently in the various countries with this mainly being attributed to political, economic and social conditions in these countries. It was also seen that EIA in developing countries is conducted as a *"separate technical exercise"* and that it is not linked with the *"technical and economic aspects of project planning and design"* (Glasson & Salvador, 2000:192).

It has also been found that in most cases EIA is conducted when most of the project has been finalized and where it wouldn't have a huge impact any more. It is seen *"as a perfunctory endorsement of public or private actions"* (Glasson & Salvador, 2000:192) rather than it being used as a tool to influence decisions.

It is important to note that the theory and practice need to be brought together. An effort needs to be made to improve EIA in developing countries. Some suggestions in this regard concerning specifically Brazil are made in this article, which is (Glasson & Salvador, 2000:209):

- It is essential for the local authorities to oversee the EIAs.

- Where the local authorities aren't capable the state authorities should conduct this review.
- For the authorities to act as statutory consultees.
- For Universities to assist with training, to assist in research. This will assist in the building of EIA capacity.
- It is also important to conduct monitoring and to ensure that what is said is actually completed.

Glasson and Salvador (2000:210) believed that implementing the above and the introduction of SEA would make some progress *"in reducing the procedure-practice gap in Brazil"*. Once implemented it could assist EIA in becoming a leading tool in the decision making process (Glasson & Salvador, 2000:210).

3.3.4.2 Chile

The only article found dealt with the influence NEPA had on the EA system in Chile. Although EIA was known and applied in Chile since 1970, it was only promulgated as a legal requirement in 1994 and the final regulation only came into force in 1997. It became essential to have some form of mandatory requirement for big projects that had been proposed in the last few decades. These projects did not take any environmental criteria into consideration with the potential for resultant environmental degradation (de la Maza, 2001:169).

In comparing NEPA with the environmental legislation for Chile, a lot of differences exist. Chile needs to focus on the *"preparation of environmental documents, public participation and the study of alternatives"* for projects (de la Maza, 2001:169). It has advantages as well as for example it focuses a lot on the "*entire human environment*" (de la Maza, 2001:179). This will assist with better decision-making and the resultant better protection of the environment. Due to the age of the EIA legislation in Chile, it is too early to come to conclusions and he suggests further investigation (de la Maza, 2001:179).

3.3.4.3 Mexico

Although EIA has been used in Mexico since 1977, only one article was found written on Mexico, which was published in 1993. Mexico is a country similar to Chile – industry and community is growing and a lot of projects have been either proposed or implemented. These have had financial, economic and technical advantages but little or no environmental consideration was taken into account in the EIA process.

Despite the changes, which occurred in the EIA legislation, guidelines, etc. there are still many areas for improvement. These are *"restricted public involvement and participation in the EIA institutional proceedings, a lack of appropriately trained personnel, and budget, information, and time constraints"* (Pisanty-Levy, 1993:267). To be able to improve EIA in Mexico it is essential to conduct an analysis on how the EIA process has developed. This analysis could then be used to propose measures which could be used to improve its performance (Pisanty-Levy, 1993: 267).

3.3.4.4 Summary for Latin America

From the above literature on countries in Latin America, it is clear that a variety of topics have been covered. This included the following:

- EIA legislation development,
- EIA application and
- Practice versus procedures.

3.3.5 Developing countries in general

In the research, twenty-nine articles were found with the focus being not on one specific country but rather using the term "developing countries" as a general topic. The decision to group these articles and discuss them separately under this heading was therefore made. Due to the fact that the term "developing countries" was used and no relationship to any specific country was introduced, it was decided to group the articles in topics and discuss them accordingly. These topics are as follows:

- EIA application and need,
- SEA application,
- EIA legal requirements,
- EIA follow-up and
- EIA integration.

EIA application and need

Cashmore *et al.* (2004:296) agreed that the purpose of EIA for many years has been to assess any significant impacts of proposals of development and then to use the outcomes to improve the design of the original development to accommodate all variants. This then gives the developer and the public a development that meets all of the environmental criteria as well as still being appealing to the interested parties.

Cashmore *et al.* (2004:297) continued to discuss other purposes of EIA's and these can be summarised as follows:

- It can be a used as a tool to mitigate the consequences of development actions resulting in the consideration of the environmental factors during the project design cycle.
- Secondly it seeks to include environmental management in the life cycle process.
- The last purpose of an EIA is to visualize it as a tool to make an informed decision especially in the development design phase.

Jay *et al.* (2007:288) described EIA's immediate purpose to supply the decision makers with an indication of the consequences of their actions. The debate has been whether EIA has met its purpose and this leads us to further probe as to whether EIA has been effective.

EIA has been enforced and adopted by many countries and in most cases they have adapted it to fit their needs. However, Jay *et al.* (2007:293) states that it is not likely that EIA will achieve its goal as not all environmental considerations are included into the decision making process. It is therefore imperative to strengthen the EIA system and link it to environmental

sustainable development. It can *"provide a much more effective means of engaging with planning processes and of achieving more sustainable patterns of development*" (Jay *et al.*, 2007:298).

Some examples where EIAs can be applied are in the privatization of the electrical power sector. Russo and Narins (1994:233) state that global privatization might increase the opportunity for environmental protection together with the implementation of EIA in these sectors. In addition environmental professionals need to pursue non-command approaches to supplement existing regulatory approaches (Russo & Narins, 1994:233). These approaches can include the preparation of EAs (Russo & Narins, 1994:233).

Another example where EIA development is used is in the trade agreements (George *et al.*, 2001:311). George *et al.* (2001:318) mentions that many of the lessons learned from EIA capacity building can be applied to trade impact assessments. The most important lesson mentioned by George *et al.* (2001:318) are the integration of the assessment process into existing policy-making frameworks as well as the establishment of mechanisms to monitor the impacts and take corrective action if required. They conclude that all *"lessons learned are relevant to the task of applying impact assessment techniques"* (George *et al.*, 2001:318).

Whereas Brown (1990:135) focuses on EIA in a development context and indicates that the identification methodologies are misplaced and that no emphasis is placed on impact prediction, evaluation & mitigation. He indicates that attention needs to be placed on *"grafting the EA onto existing systems for project conception and design and decision making"* (Brown, 1990:135).

SEA application

Brown & Thérivel (2000:183) focused on the methodology of SEA and how difficult it is to move from a useful concept to implementing it in practice. As the EA tools are developed and research is conducted more and more questions arise. Brown and Thérivel's (2000:188) aim is that this information

will evolve in effective methodologies. It is essential to note that SEA can be seen as an *"overarching concept and as a family of tools"*, applying different methodologies for *"different strategic tasks"* and *"contexts in which the SEA is prepared"* (Brown & Thérivel, 2000:188).

Brown and Thérivel (2000:188) conclude that it is important for EIA practitioners to understand the formulation of policies, programmes and plans (PPPs) and the decision-making process. Only then one can design an effective and efficient SEA, which encompasses all aspects of PPP formulation and the decision-making process. It is suggested that further research needs to be conducted in this area to enable all SEA's to fulfil their reason for evaluation. They further conclude that to realize SEA potential it is essential to find the relationship between SEA, PPP and the decision making process and link all of these together to form one comprehensive unit.

Another example is as described by Eggenberger and Partidário (2000:201) and focuses on spatial planning. They discuss the linkage between spatial planning and SEA and how it can be *"considered as a crucial condition for sound development"* (Eggenberger & Partidário, 2000:201). They then suggest a proposal based on five forms of integration that is then used as the foundation for evaluating best practices and thereby defining a framework for integration (Eggenberger & Partidário, 2000:201).

The five forms of integration will only be mentioned and are as follows (Eggenberger & Partidário, 2000:204):

- Substantive
- Methodological
- Procedural
- Institutional
- Policy

Fischer (2003:156) describes SEA as the *"big brother"* of EIA with it already being applied in many countries around the world. Previously, the environmental aspects were considered in an incremental manner in strategic and project decision-making process, therefore it has always been seen that

the practice was to move away from problems rather than seek the objectives (Fischer, 2003:156).

Originally EIA was established as an instrument to be pro-active and to address environmental consequences before practical action could occur. Therefore this is an ideal opportunity for SEA which is EIA based to make a difference, for it is more considered of the environment (Fischer, 2003:167).

The next area was focused on how SEA is adopted to achieve sustainable development given the limitations of EIA in developing countries (Alshuwaikhat, 2005:307). It is clear that the lack of transparency, accountability and public participation in the development of policy, plan & program could be addressed by the implementation of SEA.

A lot of development takes place in developing countries and the focus should be on the protection of the environment and the sustainable future of the country involved. To ensure the environment is protected these countries adopt EIA legislation and guidelines to assist them, but unfortunately environmental degradation still takes place (Alshuwaikhat, 2005:308).

This can be as a result of EIA not being effective and various reasons for this can be given. These reasons are the same as discussed earlier on e.g. *"legislation, organizational capacity, training, environmental information, participation, diffusion of experience, donor policy and political will"* (Alshuwaikhat, 2005:308). It is therefore suggested that SEA is implemented in developing countries, as it will promote SD to a larger degree than EIA.

An example of where SEA has been implemented is on trade-related policies and agreements (George and Goldsmith, 2006:254). This enables the provision of information to decision makers and trade negotiators. These types of assessments can be valuable to developing countries, especially where governmental capacity is not as broad as in developed countries.

In conclusion it is essential to have ongoing IA, which in return will influence the environment and the development of projects (George & Goldsmith, 2006:257).

EA legal requirements

A number of papers have been written dealing with EA legal requirements. The general consensus seems to be that to be effective EA needs to be legislated. It is suggested that having a legal framework will also force government departments to budget for EA. It is essential for countries to adopt *"legislation for policy SEA, or to activate and apply legislation which already exists"* (Buckley, 2000:215).

Fuggle (2006:18) explains the common sense concept and the necessity for EIA professionals to develop and comply with regulatory requirements. Theoretical training is needed and it is up to those who compile the EIA to control the output quality thereof. He further states that it is not the duty of the government to intervene with EIA but it should rather be the EIA professionals who make sure that the EIA outputs are congruent with policy and all the other criteria.

It is also essential to remember that EIA in developed countries is quite different from EIA in developing countries. One should apply it case by case depending on political and social dimension of that country. The need for EA in developing countries also differs from the need in developed countries. The ultimate outcome should always be to protect the environment but it can be that various steps are included to reach this goal, depending on the dynamics that exist in the various countries.

EIA follow-up process

The literature on EIA follow-up has grown internationally in the wake of the need to gain a better understanding of what EA is actually achieving – post decision-making. Two key papers emerged through this research namely by Morrison-Saunders *et al.* (2001) and Marshal *et al.* (2005).

Follow-up is one of the main components of EIA. It enables environmental professionals to learn from the lessons when implementing EIAs. This is the best form of learning - learn from experience and continually improve the processes implemented as a result of this learning. It is also important to note with every action there is always a cost involved but it is important to note the consequences and then relate this to the cost effectiveness. This enables better implementation of EIA in the future.

Morrison-Saunders *et al.* (2001:295) concludes that:

- The main aim of EIA is to identify significant environmental impacts and to minimize their effects on the environment.
- Tools can be used to assist with follow-up and these need to be simplistic.
- Stakeholders involved in the EIA should ensure that follow ups are conducted.
- EIA follow-ups can also assist in ensuring the loop is closed when included in EMS.
- It assists with the future improvement of EIAs.

Marshall (2005:191) states that, *"EIA is no longer an option but a sound precaution and a proactive measure"*. For in today's society new projects are often treated with apprehension and are not liked by the community. Therefore it is important to reduce the uncertainty and to verify the outcomes of an EIA study. This can only be done by a follow-up study on the initial EIA study. Marshall (2005:195) concludes that follow-up will improve the stakeholders' perception towards the process and make them feel comfortable in accepting the projects and their outcomes.

EIA integration

The integration of different forms of EA as well as the integration of EA with other environmental management tools has become a particular area of debate. Moreover, the successful integration of EIA with institutional, legal and administrative contexts also emerged in the literature.

Noorbakhsh and Ranjan (1999:291) suggest the integration of the EIA process with the planning system to improve effectiveness. Slootweg *et al.* (2001:19) place emphasis on the combination of EIA and SIA and their use as project planning instruments. This will allow developing countries to *"restore and protect the environment to safeguard natural resources for future generations"* (Slootweg *et al.*, 2001:19). It is essential for developing countries to consider the combination of their social and economic development together with the protection of the environment and the preservation of their natural resources to achieve sustainable development (Slootweg *et al.*, 2001:19). They further say that the proper application of these two tools will ensure that the quality of the project proposals is improved significantly (Slootweg *et al.*, 2001:19). This will also result in significant savings due to the fact that there will be a reduction in negative impacts and the fact that the project will be accepted with little or no revision of work required.

Ridgway (2005:331) argues that environmental tools like EMS can assist regulators with the monitoring and improvement on the delivery of the outcomes of EIAs. Ridgway (2005:331) indicates that the links between EIA and EMS is simple and cost-effective when implemented which can ensure that the environmental expectations are reached.

3.4 MAIN THEMES:

This section continues from the previous section and explores the literature relating to the themes rather than per country. This section continues addressing ***Sub-research Question 2***. The main themes and sub themes are illustrated on ***Figure 1***.

3.4.1 Theme 1: Identity of EA

Here focus is placed on the identity of EA. The identity of EA can be divided into three sections. These sections are:

- Definition
- Purpose
- Need

3.4.1.1 Definition:

Debate on the definition of EA, EIA, SEA or any other form of assessment for developing countries were lacking with no papers dealing exclusively with this aspect. Most articles however, do present some type of definition (mostly a context specific version) but do not critically reflect on it.

3.4.1.2 Purpose:

Under this section, three articles were found to be useful. In these articles the other sub themes relating to the other main themes where also mentioned (e.g. Theme 2: System; Theme 3: Effectiveness and Quality) but was decided to classify under this sub theme of 'Purpose'. The debate from these articles can be summarised as a discussion on the various tools in operation and how an integrated framework can be established (Slootweg *et al.*, 2001:19). Slootweg *et al.* (2001:27) believes that this integrated framework could be used as a tool for IA in the identification of issues, which should be addressed during an IA.

In addition to the framework Slootweg *et al.* (2001:19) suggests, Buckley (2000:209) discusses a legal framework. This framework should include the following (Buckley, 2000:209):

- *"Definition of a policy,*
- *Screening criteria and exemptions,*
- *Public advertisement,*
- *Exhibition and submission,*
- *Technical standards for environmental assessment,*

- *Substantive criteria for weighing public environmental costs against public benefits, and*
- *Provisions for third-party standing."*

Buckley (2000:209) states that when taking the above in consideration, the purpose should *"be to make policy EA a routine part of policy formulation"*.

Cashmore *et al.* (2004:297) describes the purpose of EIA and this was discussed in ***Section 3.3.5*** and will therefore not be repeated.

3.4.1.3 Need:

A total of four articles were classified in this section. In these articles the other sub themes relating to the other main themes where also mentioned (e.g. Theme 2: System; Theme 3: Effectiveness and Quality) but was decided to classify under this sub theme of 'Need'.

It is clear that the need for EA in developing countries differs from the need in developed countries although in each case the ultimate outcome should always be to protect the environment. It can be that various steps are included to reach the goal, depending on the dynamics.

This can be illustrated by means of a case study that was conducted on refugee camps. Here it is essential to perform EA before refugee camps are established. The question can be asked, why, and as Kakonge (2000:24) explains, is it that environmental degradation and de-forestation are some of the issues that occur and if an EA is not done, can get worse. It continues in saying that *"a healthy physical environment helps assure the well-being and protection of the refugee population"* (Kakonge, 2000:24).

From this case study it is also seen that in some cases the outcome of the projects contains elements of the EIA although a fully-fledged EIA was not conducted. This can be seen as a starting block to later introduce a fully-fledged EIA. The debate continues on whether EIAs are needed for refugee camps and one of the arguments is that tools are definitely needed otherwise

the environmental impact will increase. EIA is one such tool, for it is emphasised again that EIA helps with the planning and decision making process (Kakonge, 2000:28). It is essential to have EIA built into national environmental plans and strategies.

Another focus point is local involvement as they can have excellent knowledge of the area. Kakonge (2000:31) concludes this case study with the following comments – firstly EA would provide data on what is required in the area of concern, secondly training is essential and it needs to be locally specific and thirdly everyone needs to work together. This will minimize wasted time and effort spent on projects. Last but not least EA needs to be part of the national framework for then only tighter control can be exercised. It is also essential to have more case studies and where data available, otherwise EA may just become an academic speculation with disastrous consequences for the environment. Every cent spent on EIA is money well spent for if properly implemented it will have a high success rate.

It was also clear that there is a definite need to broaden traditional planning techniques and decision-making processes as described by King *et al.* (2000:280). In their literature review a conceptual framework has been provided for *"organizing the various approaches to integrate economic and environmental planning, along with supporting tools and techniques"* (King *et al.*, 2000:279). This framework illustrates how important the vertical linkages are amongst planning levels as well as how economic and environmental plans at sub national level in Asia can be integrated (King *et al.*, 2000:279).

Another example where an integrated approach is discussed is the use of environmental information systems. It is seen that although there are various limitations, EIA is still seen as a tool to incorporate environmental issues when a project is planned (King *et al.*, 2000:302) and it has been said that 70% of countries now use EIA. The suggestion is to extend EIA to SEA as up to now no developing countries in Asia have been forced to implement SEA (King *et al.*, 2000:302). From the research it is clear that a lot of work still needs to be done in the developing countries in Asia to introduce an integrated approach to economic and environmental planning.

The need for SEA has also been identified in the electrical sector. In many instances SEA is seen as restricted to public sector activities and development funding. It is seen that the private sector are embarking more and more on the adaption of SEA for the global trend are towards the privatisation of state-owned enterprises (Jay & Marshall, 2005:315). Jay and Marshall (2005:315) discuss how SEA will take place in the electrical sector.

From their case study it is evident that the practice of using SEA in the energy sector is slow and only a few examples have been noted. Some examples come from Pakistan, the Czech Republic and Slovakia (Jay & Marshall, 2005:316). It is essential to take into consideration the account structure and operation of the industry and to transfer from present to future. SEA could assist in the energy sector by *"gaining consent for new development, or in the selection of alternatives"* (Jay & Marshall, 2005:320). These alternatives need to be acceptable to a wide range of stakeholders. In some cases it might be difficult to obtain money, but it can be justified that the money will be well spent and worthwhile, for it could assist in establishing stronger environmental criteria to guide development opportunities (Jay & Marshall, 2005:320). Thus more developments will go ahead which in the end will generate more money and so the loop will be completed.

3.4.2 Theme 2: Application of EA

The second theme – Application of EA is discussed in this section. The application of EA can be divided into three sections. These sections are:

- Methodology
- Process
- System

3.4.2.1 Methodology

A total of ten articles were found in this section and will be discussed in broader terms. In these articles the other sub themes where also mentioned

(e.g. Theme 1: Purpose and Need and Theme 2: Process and System) but was decided to classify under this sub theme of 'Methodology'.

Most developing countries have introduced EIA and normally use it as part of their development planning process. It is clear that in developing countries, development aid programs and aid agencies normally assist with the implementation of EIA capacity-building programs. Doberstein (2004:285) eludes that *"EIA is a generic process or that any form of EIA will contribute positively to development planning and sustainable development"*.

He continues in saying that there has been a lack of empirical research on this subject in developing countries (Doberstein, 2004:285). More research should be done in this area. Currently EIA is seen, as a beneficial planning procedure in developing countries but it is not enforced as in developed countries. Future debates as described by Doberstein (2004:287) can be *"what constitute the 'best practice' in EIA for developing countries"*.

Doberstein (2004:313) then further describes two models that have been developed for EIA, a Technical and Planning Model. He concludes that the technical model is far better for developing countries and is better accepted by developing aid agencies and governments (Doberstein, 2004:313). It is also essential that developing countries adopt a process that can benefit them in achieving sustainable development and the main aim will then be to implement the planning model over time.

It is clear that EIA in developing countries has been modified to suit localized standards and expectations (Briffett *et al.*, 2003:171). EIA is also inadequate in addressing the issues and therefore development proposals are made. Briffett *et al.* (2003:192) provide one such proposal and that is to use SEA as an upfront supplement. It is essential to note that this is not to substitute EIA but rather as an additional tool. It was also clear that in Asian countries EIA will work were the country has a strong centralized bureaucracy for then decisions will be taken up at the top and transmitted downwards (Briffett *et al.*, 2003:192).

Briffett *et al.* (2003:193) concludes that in some countries the word on SEA and the use of area-wide studies were spread by means of overseas aid projects, e.g. Sri Lanka and Viet Nam. In other countries such as the Philippines and Malaysia, EIA was known and used. From the study it was also clear that since the Earth Summit took place in 1992 and Agenda 21 was established a wider awareness became evident regarding environmental protection. All countries are now aware of their obligation towards the environment.

This is essential to make EIA an effective decision making tool. Rajaram & Das (2006:122) iterate that to be able to implement an effective EIA, it is essential to understand the dynamics of developing countries such as India. They are summarized as two key issues (Rajaram & Das, 2006:122):

- *"How to judge the high economic growth argument?"*
- *"How to include the public in a participatory decision making process?"*

It is essential to raise public awareness and to make opportunities for consultation (Rajaram & Das, 2006:123). It is suggested that India reforms their EIA system to enable involvement from the public. Rajaram and Das (2006:124) suggest, *"the real way forward would be to institutionalize the participatory structure at the local level itself"*.

In addition to the development of EA, EMS has also evolved and developed over the last decade. When comparing these various environmental tools it is clear where similarities are and where differences are and how it interacts with EIA. Ridgway (2005:325) states that it is *"clear how some of the simple and effective environmental management tools from the EMS toolbox can be used to assist in the delivery of EIA outcomes"*.

3.4.2.2 Process

A total of ten articles were found in this section and will be discussed in broader terms. In these articles the other sub themes relating to the other main themes where also mentioned (e.g. Theme 1: Need; Theme 2:

Methodology and Theme 3: System and Quality) but was decided to classify under this sub theme of 'Process'.

Dey (2002:703) illustrates how the process of IA can be applied to petroleum pipelines. All different types of the environment have to be taken into consideration when conducting IA. It was decided to develop an integrated framework that will allow projects like this one to be easier. It is important to note that sufficient research needs to be done before a project can be investigated.

It is noted that proper assessments need to be made and only then can it assist in the overall objective of EIA to be achieved. But unfortunately EIA has still a way to go before one can stay it has reach sustainability.

The same can be said for SIA in developing countries. SIA developed from EIA. Blanco (2006:286) illustrates how SIA are used on trade policy and the implementation thereof to achieve SD. SIA is a bit different and poses some challenges. It is quite strategic from nature. This is due that trade policy forms part of the political arena regarding decision that needs to be taken on market requirements. For it to work, a vision needs to be realized and shared among all involved (Blanco, 2006:286). It is also important to note that benefits are normally seen in the process and not necessary in the results achieved.

Blanco concludes that SIA can strengthen the relationship with all the stakeholders, which will result in a better public policy. This will contribute to sustainable development (Blanco, 2006:293).

The importance of the role various stakeholders play in EIA can be illustrated by means of the example of transboundary impacts. This was discussed in the section on Azerbaijan and Turkemenistan.

3.4.2.3 System

A total of nine articles were found in this section and will be discussed in broader terms. In these articles the other sub themes relating to the other

main themes where also mentioned (e.g. Theme 2: Process and Methodology and Theme 3: Effectiveness) but was decided to classify under this sub theme of 'System'.

Cashmore (2004:403) indicated that EIA needed to develop and mature to be able to fulfil its potential. He also stated that it is inadequately developed and detailed. He described EIA *"as an uneven mixture of planning theory, traditional scientific theory and discipline-specific social, economic and biological theories"* (Cashmore, 2004:404). It is also clear that those who are involved in the EIA process; rather follow the procedures than being worried about the end results. This breeds an environment of conformation to the process rather than an effort to make sure that sustainable development continues.

Chaker *et al.* (2006:103) described a case study on Lebanon and the effort they have done on the front of environmental sustainability. Lebanon has been focusing on SEA and the implementation thereof. Although no formal SEA system exists as it is still in its preliminary stages, a lot of recommendations and propositions can be made. It is also essential that the right environment be created for the implementation of an SEA.

The population of Asian countries is expanding which is resulting in the degradation of the environment. Therefore it is so essential that environmental management tools be used to access all new developments in order to halt this degradation. By using these tools significant environmental impacts can be identified and the projects monitored which will ensure a sustainable future for all. But what one never loses focus on is that resources are required to manage all of this. These lessons have already been experienced in developed countries and one should therefore always learn that have already been learnt and not repeat the mistake that have been made in these other countries. Another important factor is to remember to have the community involved at all times for essentially in the end it is the community who will suffer the most (Atkinson, 1999:102).

3.4.3 Theme 3: Performance evaluation

The performance evaluation of EA can be divided into four sections. These sections are:

- System
- Effectiveness
- Follow Up
- Quality

3.4.3.1 System

A total of eight articles were found in this section and will be discussed in broader terms. In these articles the other sub themes relating to the other main themes where also mentioned (e.g. Theme 1: Identity; Theme 2: Methodology; Theme 3: Effectiveness and Quality) but was decided to classify under this sub theme of 'System'.

Glasson and Salvador (2000:192) stated that EIA systems vary from country to country and can take many forms, e.g. regulations, EIA guidelines, etc. EIA is applied differently in the various countries and this can mainly be contributed to political, economic and social conditions in the countries. It is seen that EIA's in developing countries are conducted as a *"separate technical exercise"* and that it is not linked with the *"technical and economic aspects of project planning and design"* (Glasson & Salvador, 2000:192).

It has also been found that in most cases EIA's are conducted when most of the project has been finalised and where it wouldn't have a huge impact any more. It is seen *"as a perfunctory endorsement of public or private actions rather than to influence decisions"* (Glasson & Salvador, 2000:192).

It is extremely important that the theory and practice be brought together. Efforts need to be made to improve EIA in developing countries. Some suggestions have been made where Brazil was used as a case study. These suggestions include the following (Glasson & Salvador, 2000:210):

- It is essential for the local authorities to oversee the EIAs, e.g. to review it.

- Where the local authorities aren't capable, the state authorities should conduct this review.
- To act as statutory consultees.
- Another suggestion is for Universities to assist with training and research. This will assist in building of capacity.
- It is also important to conduct monitoring and to ensure that what is stated as action in the EIA's is actually carried out and completed as per the requirements of the EIA's.

Glasson and Salvador (2000:210) believes that by implementing the above, it will be seen that EIAs will act as leading tool's rather than lagging tool and this will assist greatly in the process of making informed decisions.

Spaling and Vroom (2007:43) discussed a different form of EA and how it could assist in rehabilitation and reconstruction projects. Their discussion was based on the tsunami, which took place on 26 December 2004. It destroyed many lives and created massive damage to the infrastructure and the environment. It is clear that when an EA study of housing reconstruction in Indonesia is used to its full potential many benefits can be realised. These benefits could include timely information for the protecting of water supply, reducing the risk of slope management, community involvement on site planning and rehabilitating farmland, only to mention a few (Spaling & Vroom, 2007:43).

Participation of the communities is increasing in today's day and age. It is now fully realised what an important role they play. The approach is to rather have community EA. A community EA is *"an EA that uses community-centred processes for assessing the environmental sustainability of small development projects"* (Spaling & Vroom, 2007:44). It can be described by the following characteristics (Spaling & Vroom, 2007:44):

- It is a quick appraisal – the scoping of important significant impacts and issues are used as a guide.
- Site visits are used extensively and documents capturing these visits are used to assist in the compilation of EA.

- Affected communities participate taking into consideration gender and age.
- The team consists of consultants, experts and other members taking into consideration their opinion.

It is also clear from the case study that this Community EA's are normally used where a quick identification needs to be done and are normally done on smaller projects. It also focuses *"on project-related impacts rather than cataloguing the effects of a disaster"* (Spaling & Vroom, 2007:45). In conclusion it is seen that these types of EA can assist in the protection of significant environmental resources but they need to include social as well as environmental effects.

3.4.3.2 Effectiveness

A total of eighteen articles were found in this section and will be discussed in broader terms. In these articles the other sub themes relating to the other main themes where also mentioned (e.g. Theme 1: Purpose; Theme 2: Methodology; Theme 3: Follow-up and System) but was decided to classify under this sub theme of 'Effectiveness'.

Countries differ from one another, so do the people, culture and demographics. It is thus easy to accept that legal requirements also differ. Chile is one such developing country where although EIA was known since the 1970, it was only made law in 1994 and the resultant regulations promulgated in 1997 (de la Maza, 2001:169). Some big projects have been proposed and evaluated using economic and technical criteria but with no or little consideration for the environment (de la Maza, 2001:169). Chile's environmental regulations showed some important differences from the US NEPA although it was based thereon (de la Maza, 2001:169). For the sake of this study these differences will not be discussed. For more information consult the article written by de la Maza (2001:169).

It is quite evident that developing countries when compiling EIA requirements, normally seek assistance and guidance from developed countries. Ghana is

another developing country which have implemented various projects without considering the environment and which resulted in the degradation of the environment. In 1994 the Ghana Environmental Protection Agency Act (GEPAA) was proclaimed and in 1995 their EIA procedure was launched (Appiah-Opoku, 2001:69).

Appiah-Opoku (2001:70) also concluded the community needs to be involved. It is imperative to gather the local knowledge of the area. This could assist the assessment team in understanding of the local resources and sets of values of the community (Appiah-Opoku, 2001:69). The understanding thereof will assist the local communities to interpret, evaluate and monitor the projects at their level. It is also important to take note of the various generations and to understand the existence of their indigenous knowledge. Some knowledge might be lost due to Westernization and the influence the younger generation are under (Appiah-Opoku, 2001:70). All need to be involved for at the end it is for the better of the whole community.

3.4.3.3 Follow-up

A total of five articles were found in this section and will be discussed in broader terms. In these articles the other sub themes relating to the other main themes where also mentioned (e.g. Theme 2: Process and Methodology and Theme 3: Effectiveness) but was decided to classify under this sub theme of 'Follow-up'.

From the research it is clear that there is a lack of procedures internationally to conduct EIA follow-up. Before this is discussed though it is essential to understand what EIA follow-up actually is and what it implies.

It can be defined as follows:

"The monitoring and evaluation of the impacts of a project or plan for management of, and communication about, the environmental performance of that project or plan." (Marshall *et al.*, 2005: 176.)

Follow-up is one of the main components of EIA. Follow-up enables environmental professionals to learn from the lessons when implementing EIAs. This enables practitioners to improve the EIA process in the future. It is said, *"without follow-up, EIA may be little more than a paper-based exercise to improve future practice of EIA"* (Morrison-Saunders *et al.*, 2001: 289).

It is important to note that EIA follow-up can be applied in any project and is not linked to a specific section of that project. EIA practitioners should always conduct follow-up to determine the outcome of an EIA. This is the only way we can learn and continually improve the processes implemented.

In today's society new projects are often treated with apprehension and are not liked by the community. It is thus important to reduce the uncertainty and to verify the outcomes of an EIA study. This can only be done by a follow-up study on the initial EIA study. Marshall (2005:195) emphasizes that follow-up will improve the stakeholders' perception towards the process and this assists in the acceptance by the whole community.

3.4.3.4 Quality

A total of seven articles were found in this section and will be discussed in broader terms. In these articles the other sub themes relating to the other main themes where also mentioned (e.g. Theme 1: Purpose; Theme 2: Methodology and Theme 3: System) but was decided to classify under this sub theme of 'Quality'.

Many factors are blamed when it comes to the quality of EIA in developing countries. It is therefore essential to investigate a set of criteria and its application thereof in developing countries. The Maldives has been used as a case study to emphasize this.

EIAs have been used in many developing countries but this has mainly been due to funding from outside of these countries and in almost all of these cases there has been the requirement that an EIA be conducted. According to Annandale (2001:193), Wood (1995) has developed an *"ideal-typical model"*.

A comparison is therefore drawn between Maldives EIA projects and this model. Annandale (2001:187) concluded, *"that there are a number of factors contributing to the positive development of the Maldavian EIA system"*. It is suggested that these factors should be added to Wood's list to supplement his criteria used for small developing countries (Annandale, 2001:187).

These additional criteria as suggested by Annandale (2001:193) can be described as follows:

- Slowly develop a structure for EIA that will include legal as well as administrative procedures.
- In parallel with the above point apply the EIA requirements on an ad hoc basis.
- The establishment of a link between the revision and improvement of the EIA system, which will include other policy development areas. Special focus needs to be on national economic development and the approval of new projects.
- The establishment of a structure for the proponents (public and private) to get involved on a regular basis. This will assist with the ongoing revision and growth of the EIA system.
- To maintain and improve the EIA philosophy.

Other case studies have been done on Bangladesh, Malaysia and Fiji regarding the quality of EIA. Bangladesh has implemented EIA since 1995. Due to the fact that socio-economic aspects have been always been a problem, it is essential to view social impact assessments (SIA) as well. It is also clear that SIA can be incorporated into EIA (Momtaz, 2003:125).

On the other hand in Malaysia it is seen that although EIA has been around since 1976, much still needs to be improved. It is clear that EIA in Malaysia tend to be project–biased and only accommodate projects, which have only looked at the *"impact of project implementation without addressing other alternatives"* (Nor, 1991:129).

As mentioned earlier, Turnbull (2003:73) stated that Fiji *"is not serious about using EIA to control environmental quality"*. There are a lot of technical

shortcomings in the EIA system in Fiji and these needs to be addressed. Turnbull (2003:87) concludes that the quality of EA can be improved once there is a better understanding of socio-political and socio-economic dynamics together with the incorporation of these into the process of EA.

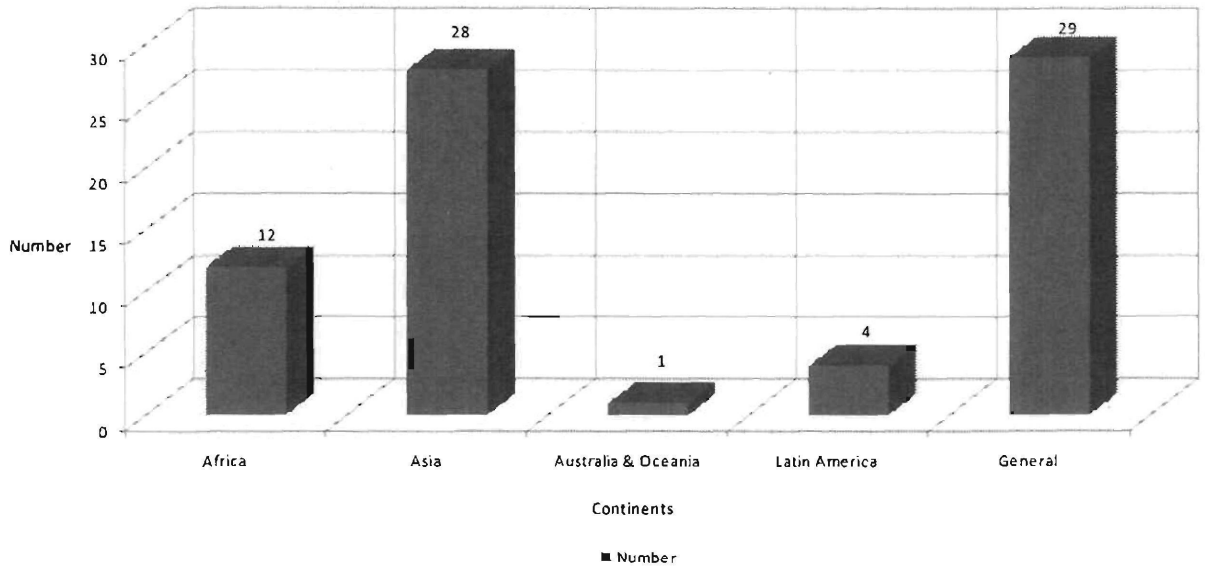
3.5 GEOGRAPHIC ORIGIN OF RESEARCH

This section addresses ***Sub-research Question 4***, which deals with the geographic origin of the articles researched.

Graph 1 illustrates the number of articles per continent. Asia was the continent with the most articles written with a total of 38 %. The category, 'General' amounted to 39 % of the research conducted. This category did not refer to a specific country, but was written on EA in developing countries in general.

The second largest amount of research has been conducted in Africa with South Africa leading in the number of articles written for one country. See ***Table 1*** for more detail.

GRAPH 1: NUMBER OF ARTICLES PER CONTINENT



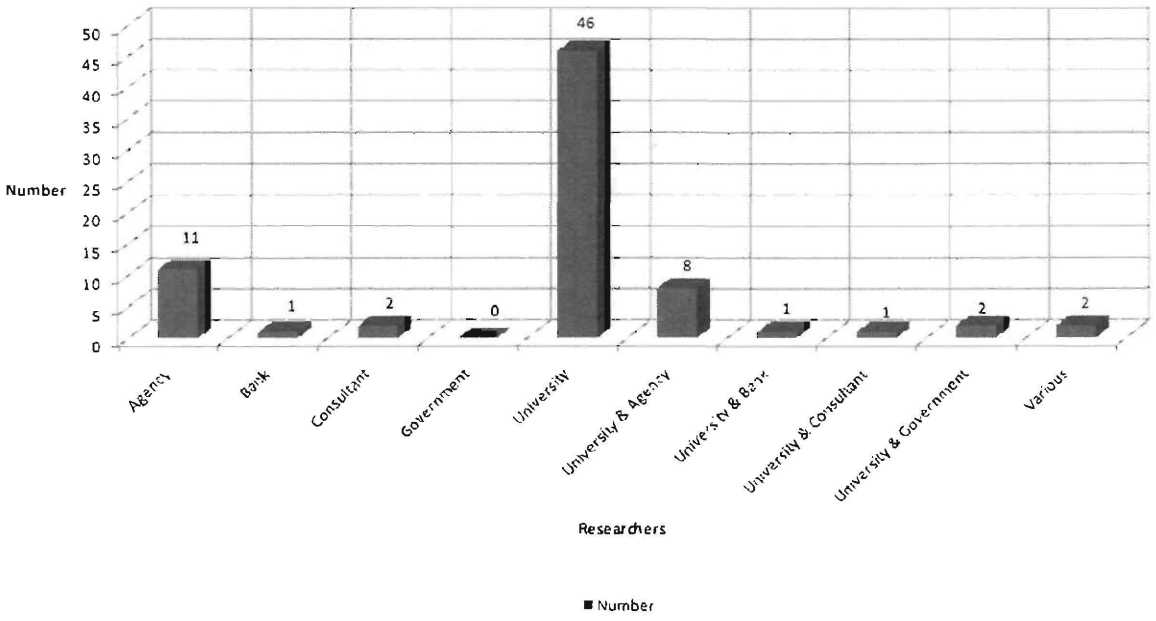
3.6 ORIGIN OF THE AUTHORS

This section addresses ***Sub-research Question 5***, which deals with who the authors of these articles are and what is their origin.

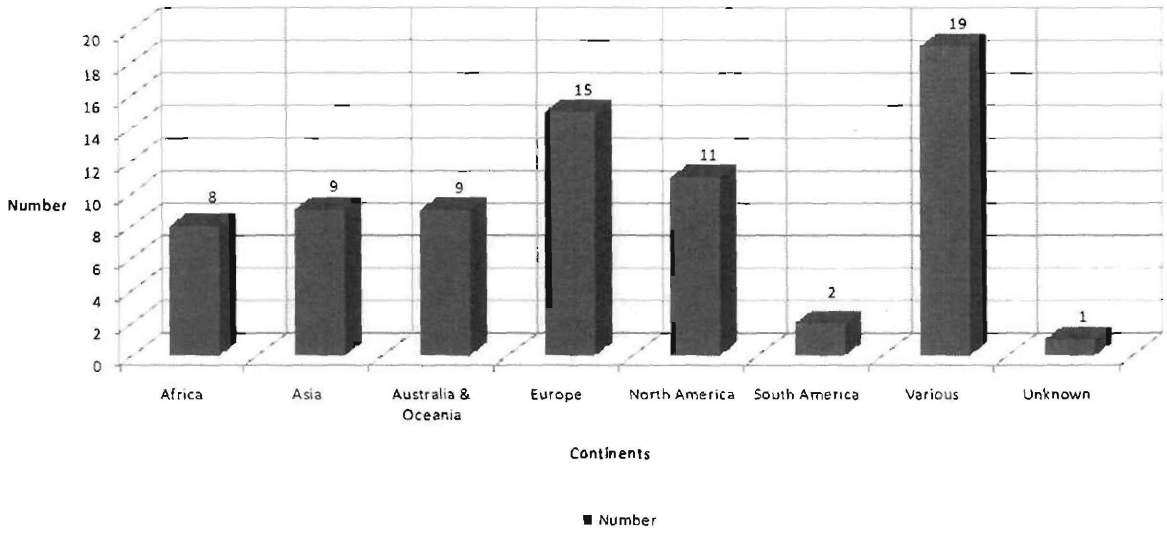
Graph 2 illustrates the background of the authors, for example whether they belong to an agency, university, etc. ***Graph 3*** shows the authors' origin per continent and ***Table 2*** compares the authors' origin with the research origin.

From ***Graph 2***, it is quite clear that most studies are sponsored and conducted through Universities or a combination thereof and mainly written by developed countries. One of the reasons can be that funds are normally available and organizations fund projects in developed countries to conduct research. Another reason can be that resources and knowledge currently mostly exists in developed countries. More institutions exist to provide training and knowledge in the field and more funds are available to conduct research.

GRAPH 2: WHO CONDUCTED THE RESEARCH?



GRAPH 3: AUTHORS' ORIGIN PER CONTINENT



Graph 3 illustrates the origin of the authors of the articles researched in this mini-dissertation. It was decided to group the articles per continent. This will provide consistency when comparing the amount of articles written per continent. The category 'Various' refer to the situations where several authors were involved in the writing of the articles and/or where they originated from more than one continent. One article was found which did not provide the background of the author, therefore the category 'Unknown'.

Continents like "Australia and Oceania", "Europe" and "North America" are seen as mainly consisting of developed countries. It is clear from this graph that these continents greatly contributed to the writing of the articles. This is supported by the fact that for only 29.7% of the articles the authors' origin and case studies were from the same country. It is clear that most authors are from developed countries and not developing countries. This suggests that developed countries mainly fund research on EA in developing countries and that the knowledge base is subsequently situated in developed countries. The extent of knowledge transfer is unknown.

TABLE 2: COMPARISON OF ORIGIN OF THE ARTICLES AND AUTHORS

CONTINENT	TOTAL ARTICLES	AUTHORS ORIGIN AND CONTINENT THE SAME	%
Africa	8	7	87.5 %
Asia	9	8	88.9 %
Australia & Oceania	9	1	11.1 %
Europe	15	0	0.0 %
Latin America	3	3	100.0 %
North America	10	2	20 %
Various	19	16	84.2 %
Unknown	1	Unknown	-

The above table (***Table 2***) illustrates that Africa, Asia and Latin America authors' are conducting research relating to their native countries.

3.7 CONCLUSION:

This chapter focused on discussing the data and providing detail, which enables the researcher to answer the various ***Sub-research Questions***. First the author introduced the reader to the main themes, which were then mapped over time. This allowed the author to gain the required knowledge to see how the debates have evolved over time. Most of the research in developing countries started in the 1990's and progressed slowly. It picked up around 2000 – 2001 and then tailored off and it seems like it has started to progress again since 2006.

The next section then focuses on the various debates in the developing countries that were found in the respective articles researched. Adjacent to this the author thought it worthwhile to, where data was available, to see how the legalized systems progressed in the respective countries. This led to the next section where the main themes were discussed in more detail using the information obtained from the articles researched.

Another interesting fact was to link the geographic origin of the research with the origin of the authors of the respective articles and it was clear that only 29.7% of the articles and authors had the same origin. This showed that developed countries contribute significantly to the knowledge base on EA in developing countries.

This chapter demonstrates that all the ***Sub-research Questions*** have been answered. The next chapter captures the conclusions from this mini-dissertation in relation to the overall research question and ends by making recommendations for future research.

CHAPTER 4: DISCUSSION AND CONCLUSION

This chapter presents a discussion on the overall conclusions reached from the research results described in the previous chapter. It aims to answer the ***Research Question*** namely:

What are the main academic debates on EA in developing countries?

This chapter includes two sections. The first deals with the main debates surrounding EA in developing countries and the second section discusses the way forward looking at the next frontiers in EA research.

4.1 MAIN DEBATES

The aim of the mini-dissertation was to identify the EA debates for developing countries. A wealth of literature was identified from key academic journals to serve as basis for the analysis. Various debates were discussed in ***Chapter 3*** in relation to certain main themes. It is concluded that these themes indeed provide a good basis to organize and classify the literature. The following sections also provide a discussion in relation to these themes.

However, it is argued that EA debates reflected in the literature for developing countries are very diverse covering different contexts, different scales (such as case studies to broad survey results) of data, and different interpretations of similar concepts such as EIA, SEA, follow-up, etc. It is argued that due to the diverse nature of the literature no common 'golden' thread (or threads) could be identified and that the different contributions could be considered isolated.

The theme classification is useful to structure and organize the literature but there is still no obvious evolution in debate within the different themes. The lack of a common thread implies that EA literature is disjointed and emerges

within different themes and not in relation to particular evolutionary debates as such. It seems to be distinctly ad hoc academic outputs rather than incremental contributions building on existing knowledge and existing critical argumentation. The conclusion here is thus not one of presenting main debates but rather main themes within which academic contributions are made. Distinctive evolutionary debates on EA in developing countries are thus limited.

4.1.1 Identity of EA in developing countries

In the "Introduction to Main Themes", ***Section 3.1***, the 'Identity of EA' was eluded as *'What is EA?'*. Three sub themes where identified and the articles were grouped accordingly. These sub themes were *'Need'*, *'Purpose'* and *'Definition'* and were described in ***Chapter 3***.

The definition of EA was not discussed in detail in any of the papers. This is somewhat worrying since the definition of EA is fundamental to our understanding and it is evident that the diverse contexts in which EA is being applied in the developing world do require in depth debate on the definition of EA. The purpose of EA were described in three articles although such discussion lacked theoretical depth and again mainly dealt with particular contexts. The purpose of EA in developing countries should differ from the understanding in developed countries and can be considered a fundamental issue for EA, which needs to be explored in a lot more depth.

When looking at the need for EA it is evident that this aspect was not critically considered with all authors of the opinion that EA is a good thing with environmental protection its main objective. Moreover, al the authors stressed that EA should be designed to contribute taking cognizance of the unique context in which it is being applied. A lot more scope for debate exists to clarify why EA is necessary in developing countries beyond the obvious need to protect the environment. The use of EA as a decision support / making tool and the limitations of what EA is able to achieve did not form part of the argumentation.

4.1.2 Application of EA in developing countries

It is evident that a wealth of literature exist dealing with how EA should be applied. The main agreement seems to be that the application of EA is context specific and that each country should design the EA system most appropriate to the local situation. In this regard the literature also describes the application of EA within particular contexts, which makes it difficult to compare lessons learned across different contexts. Reading and interpreting the articles was also difficult at times due to the context specific nature of the results. The transferability of knowledge in terms of different developing countries is unclear and the authors lack the data to generalize certain conclusions for developing countries in general. There is thus a need to move debates beyond context specific descriptions of EA application to also inform and provide a more holistic view of EA application in the developing world.

4.1.3 Performance Evaluation:

When looking at performance evaluation, the question is asked *'How well is EA being done?'*. This main theme was also divided into sub themes, which are 'Effectiveness', 'Follow-up' and 'Quality'. It is significant that that this theme was explored widely for developing countries, which should be interpreted as a good thing since the developed world has admitted to spending too much time debating how EA should be done and too little time on how effective it has been. The emergences of EA follow-up literature for developing countries will undoubtedly also contribute in pushing debate forward. The lack of resources and capacity in developing countries requires a clear understanding of the effectiveness of EA. The emphasis on performance evaluation should thus be considered a very positive finding.

4.2 THE NEXT FORNTEIRS FOR EA RESEARCH

Cashmore (2004:422) states that the EIA research agenda needs to evolve and mature in order for EA to be seen as a globally significant decision tool. The author agrees with this statement and considers the following key areas for future research on EA in developing countries:

- The depth of argumentation needs to be improved with more emphasis on the theoretical grounding of EA. Future research should aim to strengthen the theory of EA.
- The various context specific contributions to EA in developing countries provides a good foundation of knowledge but there is a serious need for more comparative research to distil universal agreement on EA and how it should be applied and what it should aim to achieve. At this stage the debate in EA in developing countries is too context specific.
- Institutions from developed countries should be encouraged to support and partner with counterparts in developing countries. This is especially so as they already contribute to the developing countries knowledge base on EA as described in ***Section 3.6***.
- Many multi-lateral institutions, e.g. World Bank, United Nations Environment Programme, etc., are normally involved with developing countries. A suggestion would be to encourage these organisations to undertake more research-based reviews of EA practices in developing countries and to make recommendations.

Finally it is evident that EA is a relatively new field of research, which still needs to mature in terms of the development of theory and research traditions. However, the extent of literature and research that emerged over the past decade can be considered a good basis from where to improve the understanding of EA in developing countries.

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APPENDIX A

SUMMARY OF ARTICLES USED IN RESEARCH

Article No.	*Name of Article*	*Author*	*Journal*	*Published Date*	*Theme*	*Sub Theme*	*Country*	*Initiator*
1	A performance evaluation of strategic environmental assessment (SEA) processes within the South African context.	F Retief	EIAR	2007	Performance Evaluation	Quality	South Africa	University
2	Strategic environmental assessment can help solve environmental impact assessment failures in developing countries.	HM Alshuwaikhat	EIAR	2005	Application	System	Developing Countries in general	University
3	EIA models and capacity building in Viet Nam: an analysis of development aid programs.	B Doberstein	EIAR	2004	Application	Methodology	Viet Nam	University
4	Reform of the EIA process in Indonesia: improving the role of public involvement.	D Purnama	EIAR	2003	Application	Process	Indonesia	University
5	The transboundary EIA convention in the context of private sector operations co-financed by an International Financial Institution: two case studies from Azerbaijan and Turkmenistan.	MM Nazari	EIAR	2003	Application	Process	Azerbaijan & Turkmenistan	Bank
6	Towards SEA for the developing nations of Asia.	C Briffett, JP Obbard & J Mackee	EIAR	2003	Application	Methodology	Asia	University

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7	Environmental impact assessment in the Fijian state sector.	J Turnbull	EIAR	2003	Performance Evaluation	Quality	Fiji	University
8	An integrated assessment model for cross-country pipelines.	PK Dey	EIAR	2002	Application	Process	India	University
9	NEPA's influence in developing countries: the Chilean case.	CL de la Maza	EIAR	2001	Performance Evaluation	Effectiveness	Chile	University
10	Environmental impact assessment in developing countries: the case of Ghana.	S Appiah-Opoku	EIAR	2001	Performance Evaluation	Effectiveness	Ghana	University
11	EIA in Brazil: a procedure-practice gap. A comparative study with reference to the European Union, and especially the UK.	J Glasson & NNB Salvador	EIAR	2000	Performance Evaluation	System	Brazil	University
12	Organizational change and environmental impact assessment at the electricity generating authority of Thailand: 1972-1988.	A Shepherd & L Ortolano	EIAR	1997	Performance Evaluation	Effectiveness	Thailand	University & Agency
13	Opportunities for environmental protection through privatization of the electric power sector in developing countries.	TN Russo & MJ Narins	EIAR	1994	Application	System	Developing Countries in general	Agency
14	Mexico's environmental assessment experience.	J Pisanty-Levy	EIAR	1993	Performance Evaluation	Effectiveness	Mexico	University
15	Problems and perspectives in Malaysia	YM Nor	EIAR	1991	Performance Evaluation	Quality	Malaysia	University

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16	Environmental impact assessment in a development context.	AL Brown	EIAR	1990	Application	Methodology	Developing Countries in general	University
17	The role of science in environmental impact assessment: process and procedure versus purpose in the development of theory.	M Cashmore	EIAR	2004	Application	System	Developing Countries in general	University
18	Environmental impact assessment: Retrospect and prospect.	S Jay, C Jones, P Slinn & C Wood	EIAR	2007	Performance Evaluation	Effectiveness	Developing Countries in general	University
19	Decision-orientated environmental assessment: An empirical study of its theory and methods.	F Pischke, M Cashmore	EIAR	2006	Performance Evaluation	System	Developing Countries in general	University
20	Strategic environmental assessment in post-modern times.	TB Fischer	EIAR	2003	Application	System	Developing Countries in general	University
21	What is common sense in the first world may not be common sense in the third world.	R Fuggle	IAPA	2006	Identity	Need	Developing Countries in general	University
22	Evaluation of environmental impact assessment procedures and practice in Bangladesh.	R Ahammed & N Harvey	IAPA	2004	Performance Evaluation	Effectiveness	Bangladesh	University & Government

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23	The practice of social impact assessment in a developing country: the case of environmental and social impact assessment of Khulna-Jessore Drainage Rehabilitation Project in Bangladesh.	S Momtaz	IAPA	2003	Performance Evaluation	Quality	Bangladesh	University
24	Environmental capacity-building in a transitional economy: the emergence of EIA capacity in Viet Nam.	B Doberstein	IAPA	2003	Performance Evaluation	Effectiveness	Viet Nam	University
25	Capacity building for trade impact assessment: lessons from the development of environmental impact assessment.	C George, R Nafti & J Curran	IAPA	2001	Performance Evaluation	Effectiveness	Developing Countries in general	University & Agency
26	Developing and evaluating environmental impact assessment systems for small developing countries.	D Annandale	IAPA	2001	Performance Evaluation	Quality	Maldives	University
27	A model for sustainable development: integrating environmental impact assessment and project planning.	F Noorbakhsh & S Ranjan	IAPA	1999	Performance Evaluation	Effectiveness	Developing Countries in general	University & Government
28	An evaluation of environmental impact assessment in Eritrea	TK Zeremariam & N Quinn	IAPA	2007	Performance Evaluation	System	Eritrea	University
29	Introduction: Impact assessment of trade-related policies and agreements: experience and challenges	C George & B Goldsmith	IAPA	2006	Application	Methodology	Developing Countries in general	University

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30	Environmental impact assessment in Uzbekistan	G Khusnutdinova	IAPA	2004	Performance Evaluation	Effectiveness	Uzbekistan	University
31	Sustainability impact assessment of trade policy and its implication in the context of Latin America	H Blanco	IAPA	2006	Application	Process	Latin America	Agency
32	Benefiting from the practice of social impact assessment.	RJ Burdge	IAPA	2003	Performance Evaluation	Effectiveness	Developing Countries in general	University
33	Environmental impact assessment in sub-Saharan Africa: the Gambian experience.	JO Kakonge	IAPA	2006	Performance Evaluation	Effectiveness	Gambia	University
34	Need for participatory and sustainable principles in India's EIA system: lessons from the Sethusamudram Ship Channel Project.	T Rajaram & A Das	IAPA	2006	Application	Methodology	India	University
35	Environmental Economic valuation and its application in environmental assessment: an evaluation of the status quo with reference to South Africa.	D Crookes & M de Wit	IAPA	2002	Application	System	South Africa	University & Agency
36	Toward a national strategic environmental assessment system in Lebanon.	A Chaker, K El-Fadl, L Chamas, MAZ Daou & B Hatjian	IAPA	2006	Application	System	Lebanon	Agency
37	Round table: Common sense in environmental impact assessment: it is not common as it should be.	WA Ross, A Morrison-Saunders & R Marshall	IAPA	2006	Performance Evaluation	Quality	Developing Countries in general	University & Agency

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38	Environmental assessment in Malaysia: a means to an end or a new beginning?	C Briffett, J Obbard & J Mackee	IAPA	2004	Application	System	Malaysia	University
39	Environmental assessment after the 2004 tsunami: a case study, lessons and prospects.	H Spaling & B Vroom	IAPA	2007	Performance Evaluation	System	Southeast Asia	University & Agency
40	Environmental impact assessment during project execution phases: towards a stage-gate project management model for the raw materials processing industry of the energy sector.	AC Brent & W Petrick	IAPA	2007	Application	Process	South Africa	University
41	The place of strategic environmental assessment in the privatised electricity industry.	S Jay & R Marshall	IAPA	2005	Identity	Need	Developing Countries in general	University & Agency
42	Principles to guide the development of strategic environmental assessment methodology.	AL Brown & R Thérivel	IAPA	2000	Application	Methodology	Developing Countries in general	University
43	Roles and stakes in environmental impact assessment follow-up.	A Morrison-Saunders, J Arts, J Baker & P Caldwell	IAPA	2001	Performance Evaluation	Follow up	Developing Countries in general	University
44	A review of provincial environmental impact assessment administrative capacity in South Africa.	AG Duthie	IAPA	2001	Performance Evaluation	Follow up	South Africa	Consultant
45	An evaluation of the Hong Kong environmental impact assessment system.	C Wood & L Coppell	IAPA	1999	Performance Evaluation	Effectiveness	Hong Kong	University & Agency

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46	Development of a framework to assist the integration of environmental, social and economic issues in spatial planning.	M Eggenberger & M Partidário	IAPA	2000	Performance Evaluation	System	Developing Countries in general	Agency
47	Strategic environmental analysis (SEAN): a framework to support analysis and planning of sustainable development.	JJ Kessler	IAPA	2000	Performance Evaluation	System	Developing Countries in general	Agency
48	Environmental assessment in Cameroon: state of the art.	D Bitondo	IAPA	2000	Performance Evaluation	Effectiveness	Cameroon	University
49	An oil refinery in the North Atlantic: environmental profile.	J Sólnes	IAPA	2000	Application	Process	Russia	University
50	Spatial analysis of social impacts of the Eastern Seaboard Development Programme, Thailand.	C Indhapanya, JK Routray & HD Kammeier	IAPA	1999	Application	Methodology	Thailand	University
51	International principles for best practice EIA follow-up.	R Marshall, J Arts, A Morrison-Saunders	IAPA	2005	Performance Evaluation	Follow up	Developing Countries in general	Various
52	Environmental management system provides tools for delivering on environmental impact assessment commitments.	B Ridgway	IAPA	2005	Application	Methodology	Developing Countries in general	Consultant
53	Environmental impact assessment follow-up and its benefits for industry.	R Marshall	IAPA	2005	Performance Evaluation	Follow up	Developing Countries in general	Agency

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54	Function evaluation as a framework for the integration of social and environmental impact assessment.	R Slootweg, F Vanclay, M van Schooten	IAPA	2001	Identity	Purpose	Developing Countries in general	University
55	A review of refugee environmental-oriented projects in Africa: a case for environmental impact assessment.	JO Kakonge	IAPA	2000	Identity	Need	Africa	Agency
56	The interminable issue of effectiveness: substantive purpose, outcomes and research challenges in the advancement of environmental impact assessment theory.	M Cashmore, R Gwilliam, R Morgan, D Cobb & A Bond	IAPA	2004	Identity	Purpose	Developing Countries in general	University
57	Strategic environmental assessment of policies and plans: legislation and implementation.	R Buckley	IAPA	2000	Identity	Purpose	Developing Countries in general	University
58	Methodologies for sustainable impact assessments of proposals for new trade agreements.	N Lee & C Kirkpatrick	JEAPM	2001	Application	Methodology	Developing Countries in general	University
59	Strategic environmental assessment of the India ecodevelopment project: experiences, prospects and lessons learnt.	A Rajvanshi	JEAPM	2001	Performance Evaluation	Effectiveness	India	Agency
60	Environmental assessment in Vietnam: theory and practice.	JP Obbard, YC Lai & C Briffett	JEAPM	2002	Application	Process	Viet Nam	University

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61	Environmental policy and management in Asia: a learning experience	N Atkinson	JEAPM	1999	Application	System	Asia	University
62	Environmental assessment in Sri Lanka: its status and the potential for the introduction of strategic environmental assessment.	J Mackee, J Obbard & C Briffett	JEAPM	2001	Performance Evaluation	Effectiveness	Sri Lanka	University & Consultant
63	A conceptual framework for integrated economic and environmental planning in Asia - a literature review.	P King, D Annandale & J Bailey	JEAPM	2000	Identity	Need	Asia	Bank & University
64	Promoting Public Participation for integrating sustainability issues in environmental decision making: The Indian Experience.	A Rajvanshi	JEAPM	2003	Performance Evaluation	Effectiveness	India	Agency
65	Public participation and social acceptability in the Philippine EIA process	LM Cooper & JA Elliott	JEAPM	2000	Performance Evaluation	Effectiveness	Philippine	University
66	Geographical information systems and expert systems for impact assessment Part 1: GIS	A Rodriguez-Bachiller	JEAPM	2000	Performance Evaluation	System	Developing Countries in general	University
67	EIA follow-up in South Africa: Current status & recommendations.	J Hulett & R Diab	JEAPM	2002	Performance Evaluation	Follow up	South Africa	University
68	Contextual phases in the institutionalization of the environmental assessment of road development in Cameroon.	D Bitondo & P André	IAPA	2007	Application	Process	Cameroon	University

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69	Environmental Impact Assessment Regulation in Hong Kong and Shanghai: A Cross-city analysis.	CW Lo & PK Yip	JEAPM	1999	Performance Evaluation	Quality	Hong Kong & Shanghai	University & Agency
70	Simulation modelling in resource management: a sustainable development approach to resource extraction in Sierra Leone.	JB Tengbe	JEAPM	2001	Application	Methodology	Sierra Leone	Agency
71	Policy and Practice – Green Grass and Brown Roots: Understanding Environmental Problems in Deprived Neighbourhoods.	G McGranahan, J Leitman & C Surjadi	JEAPM	1998	Application	Process	Developing Countries in general	Various
72	International biodiversity related treaties and impact assessment – how can they help each other?	D Pritchard	IAPA	2005	Application	Process	Developing Countries in general	Agency
73	An empirical-theoretical analysis framework for public participation in Environmental Impact Assessment.	JR Palerm	JEAPM	2000	Application	System	Developing Countries in general	University
74	Sustainable development: A transdisciplinary overview of the literature	K Pezzoli	JEAPM	1997	Performance Evaluation	System	Developing Countries in general	University