

**AN ANALYSIS OF TECHNICAL AND TACTICAL  
PERFORMANCE OF NATIONAL SOCCER TEAMS OF  
KENYA, GERMANY AND ARGENTINA**

**BY**

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**A PH.D THESIS SUBMITTED TO THE DEPARTMENT  
OF PHYSICAL EDUCATION IN FULFILMENT OF THE  
REQUIREMENTS FOR DOCTOR OF PHILOSOPHY OF  
KENYATTA UNIVERSITY**

**2000**

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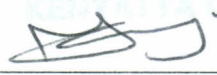
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## Dedication

This Thesis is dedicated to my loving and caring wife, Fletcher Injede and children; Angela Nasimiyu, Fiona Namuyonga, Dennis Bwabi and above all to God the Almighty.

## ACKNOWLEDGEMENT

I would like to express my indebtedness to my university supervisors, Dr. E. Wamukoya and Dr. F. Ingule for their invaluable contribution and guidance that brought this study to a fruitful completion.

My special gratitude is extended to Dr. E.M. Wekesa, whose initial suggestion, guidance and contribution laid the foundation for the study as well as Prof. D.N. Sifuna, whose constructive critical assessment and suggestions were outstanding.

I wish to thank Kenyatta University for the financial support that enabled me to carry out the study. Special mention is also extended to the Department of Physical Education, Kenyatta University for availing the much needed time and support while carrying out the work.

To Mr. J.M. Asembo of Egerton University, I am greatly indebted. I also wish to thank my other friends Messrs.: G. Kiganjo, S. Munayi, and S. Gathua, for their constant encouragement.

My special thanks are directed to Bro. Kailiti, Sis. E. Adede, Mr. V. Wanyama, Mrs. M. Masinde, Video Library Staff and others at Kenya Broadcasting Corporation for having facilitated the access, retrieval and the viewing of the Matches.

## ABSTRACT

This study set out to identify the differences in the technical and tactical performance of the national soccer teams in matches involving Germany, Argentina and Kenya at International level. Additionally, the study sought to identify the variables that characterise the respective winning and losing teams and to establish the level of accuracy of each of the technical and tactical variables in matches. A total of 27 unedited and pre-recorded matches were observed on a play back video machine. The matches involved were nine for Kenya, nine for Argentina and nine for Germany. The matches were selected on a stratified random sampling basis. The data obtained were analysed both descriptively and inferentially. The statistical analysis techniques used included the one-way analysis of variance and the independent t-test, where the rejection of the null the hypothesis was set at  $p < .05$ . A post hoc comparison Newman-keuls test was used to confirm significant findings on the F ratio.

The ANOVA findings revealed that whereas there was a significant difference in the performance of the off sides, corner kicks, throw-ins, headings, free kicks, and goal kicks, in the matches involving the national soccer teams of Germany, Argentina and Kenya, that on passes, goals, shots at goal, crosses, tackles,

attacking movements, fouls and injuries was not significant. It was also established that the winners tended to have more passes, free kicks, offsides, fewer corners, more throw-ins, more shots at goal, more headings, goal kicks and fewer fouls. However, differences existed between the matches involving Kenya, Germany and Argentina pertaining to the throw-ins, crosses, fouls and attacking play. Regarding the effectiveness in the execution of the technical variables, Kenya had a higher ratio of unsuccessful throw-ins, shots at goal, free kicks, crosses, corners and passes. However, Kenya had a higher ratio of successful headings and goal kicks compared to Germany and Argentina. Argentine players were the most effective in tackling. It was recommended that efforts be initiated to start a research studies focusing on management of Kenyan national soccer teams; conduct similar studies using the Kenya premier league teams, and in comparing the different regions of Africa.

## TABLE OF CONTENTS

Title Page .....	i
Declaration .....	ii
Supervisors' approval .....	iii
Dedication.....	iv
Acknowledgement .....	v
Abstract .....	vii
Table of Contents .....	ix
List of Tables .....	xii

### CHAPTER ONE: INTRODUCTION

1.1.0 Background to the problem .....	1
1.2.0 Soccer in Kenya, Germany and Argentina.....	6
1.3.0 Theoretical base of the study .....	16
1.4.0 Statement of the problem .....	19
1.5.0 Research Hypotheses .....	19
1.6.0 Rationale .....	21
1.7.0 Assumptions of the study .....	23
1.8.0 Limitations .....	24
1.9.0 Delimitation .....	24

1.10.0 Definitions.....	25
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**CHAPTER TWO: REVIEW OF LITERATURE**

2.0.0 Introduction.....	27
2.1.0 Factors affecting performance .....	27
2.2.0 Match analysis .....	33
2.2.1 Match analysis in soccer .....	39
2.3.1 Summary.....	50

**CHAPTER THREE: RESEARCH METHODOLOGY**

3.0.0 Introduction .....	52
3.1.0 Target population .....	52
3.2.0 Sampling Method .....	53
3.3.0 The Research Instrument .....	54
3.4.0 Procedure .....	54
3.5.0 Data Analysis Techniques .....	55

**CHAPTER FOUR: RESULTS AND DISCUSSION**

4.1.0 Introduction .....	58
4.2.0 Match Analysis findings .....	58
4.2.1 Technical variables for and against Germany, Argentina, Kenya--	59
4.2.2 Winning and Losing teams-----	88

4.2.3 Successful and Unsuccessful Technical executions-----	113
4.2.4 Effective executions of Technical variables-----	140

**CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

5.1.0 Introduction .....	158
5.2.1 Summary of findings .....	158
5.2.2 Match analysis findings.....	160
5.3.1 Conclusions .....	166
5.4.0 Recommendations .....	167
5.4.1 Policy and Practice .....	167
5.4.2 Further Research .....	168
References.....	169

**APPENDICES**

Appendix A: Match Analysis Chart .....	181
Appendix B: List of matches.....	182

**LIST OF TABLES**

Table 1: Differences in Passes for the national teams of Germany, Argentina and Kenya .....	59
---	----

Table 2:	Differences in Goals for National teams of Germany, Argentina and Kenya .....	61
Table 3:	Differences in Offsides for National teams of Germany, Argentina and Kenya .....	62
Table 4:	Differences in Corners-Kicks for national teams of Germany, Argentina and Kenya .....	65
Table 5:	Differences in the Throw-ins for National teams of Argentina and Kenya .....	67
Table 6:	Differences in goal attempts for national teams of Germany, Argentina and Kenya .....	69
Table 7:	Differences in crosses for national teams of Germany, Argentina and Kenya .....	71
Table 8:	Differences in headings for national teams of Germany, Argentina and Kenya .....	73
Table 9:	Difference in free kicks for national teams of Germany, Argentina and Kenya .....	75
Table 10:	Differences in goal kicks for national teams of Germany, Argentina and Kenya .....	77
Table 11:	Differences in tackles for national teams of Germany, Argentina and Kenya .....	79
Table 12:	Differences in frequency of attacks for national teams of Germany,	

	Argentina and Kenya. ....	81
Table 13:	Differences in fouling rate for national teams of Germany, Argentina and Kenya .....	83
Table 14:	Differences in injuries for national teams of Germany, Argentina and Kenya .....	85
Table 15:	Differences in passes made in won and lost matches .....	89
Table 16:	Differences in goals scored in won and lost matches .....	91
Table 17:	Differences in number of offsides in matches won and lost..	92
Table 18:	Differences in corners taken in won and lost matches .....	94
Table 19:	Differences in throw-ins taken in won and lost matches ...	96
Table 20:	Differences in attempts at goal in won and lost matches.....	98
Table 21:	Differences in crosses made in won and lost matches ...	100
Table 22:	Differences in headings executed in matches won and lost. -	102
Table 23:	Differences in free kicks taken in matches won and lost ...	104
Table 24:	Differences in goal kicks taken in matches won and lost ...	106
Table 25:	Differences in tackles executed in won and lost matches ...	108
Table 26:	Difference in fouls made in won and lost matches .....	109
Table 27:	Difference in offensive moves made in won and lost matches	111
Table 28:	Successful and unsuccessful throw-ins .....	114
Table 29:	Successful and unsuccessful goal attempts .....	117
Table 30:	Successful and unsuccessful free kicks .....	120

Table 31:	Successful and unsuccessful headings .....	122
Table 32:	Successful and unsuccessful crosses .....	125
Table 33:	Successful and unsuccessful goal kicks .....	128
Table 34:	Successful and unsuccessful corner kicks .....	131
Table 35:	Successful and unsuccessful passes .....	134
Table 36:	Successful and unsuccessful tackles .....	137
Table 37:	Differences in effective execution of passes by winning and losing teams.....	140
Table 38:	Differences in effective execution of corner kicks by winning and losing teams .....	142
Table 39:	Difference in effective execution of throw-ins by winning and losing Teams ... ..	144
Table 40:	Difference in effective execution of shots at goal by winning and losing teams .....	146
Table 41:	Difference in effective execution of crosses by winning and losing teams .....	148
Table 42:	Difference in effective execution of headings by winning and losing Teams.....	149
Table 43:	Difference in effective execution of free kicks by winning and losing teams.. ..	150
Table 44:	Difference in effective execution of goal kicks by winning and losing	

Teams..... 152

Table 45: Difference in effective execution of tackles by winning and losing

Teams ..... 154

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.0 BACKGROUND TO THE PROBLEM**

Soccer or association football is a ball game. A regular soccer game has two teams each with eleven players and five substitutes from whom three can be fielded in a given match. The object of the game is to score by putting a ball into the opponent's goal and the winning team is the one that scores the greater number of goals (IFAB, 1996; Luongo, 1996; Midgley, 1979; Toye, 1984). The avenue where teams and players strive to score and to defend their goal is in competitions.

Soccer competitions provide avenues at which players and the coach apply the techniques and tactics acquired. In a competitive soccer match, the teams demonstrate contrasts in techniques and tactics (Docherty, 1978; Wade, 1970; Winterbottom, 1964). Some teams may favour open play with long passes while others may prefer a closely - knit pattern of play. In a test game, the exchanges are so rapid that the observer has little time to study each separate movement of play (Winterbottom, 1964). The pace of the game, the emotions aroused by the occasion, the partisan spirit of the observer, and the rapid succession of activities makes it difficult for a coach to give an objective and critical analysis of the factors underlying play (Winterbottom, 1964).

According to Winterbottom (1964) critical assessment of an individual or a team's performance requires not only a sound technical knowledge of the game, but also a

disciplined mind in order to focus on separate factors. To overcome the deficiencies of mental analysis, an objective evaluation instrument is necessary (Hughes, 1995; Lawther, 1951, 1972; Winterbottom, 1964). Proper analysis of performance will enable the coach to retain and develop what is good and improve what a team is deficient in (Winterbottom, 1964). The coach uses the data to communicate to the players with regard to the level of play and the set objectives (Liewellyn & Blucker, 1986; Rothstein et. al., 1981; Thompson, 1991). Such data also provides feedback for motivation and further improvement of performance (Hughes, 1995; Lawther, 1951; 1972; Liewellyn & Blucker, 1982; Smith, 1986).

Effective analysis of performance in soccer requires that specific and measurable behaviours or consequences be identified. The behaviours that are included should be countable (Smith, 1986). The variables can be fairly global such as the number of tackles per match or defensive tackles in own half of the field. After the identification of the specific behaviours to be observed, a system for measuring them can be developed (Akama et. al., 1996a, b; Mwisukha, 1997; Smith, 1986).

As a result, considerable amount of research has been devoted to establishing the need for objective forms of analysis and their importance in the coaching process (Reilly, 1995). Findings from research efforts have revealed the difficulties facing any single individual attempting to analyse and remember objectively the events occurring in complex team games. One of the solutions to the coaches' dilemma in

comprehending and anticipating the direction of the developments, in a game situation, is the use of notation analysis systems. According to Dufour (1995), the notation system should guide the match observation with regard to physical efforts, technical elements and tactical movements of the players. The observer is therefore able to collect and analyse information on;

- i. the evolution of those parameters during the match for the whole competition or the year,
- ii. the level of the player in relation to the average level of the team, and
- iii. the level of the team in relation to other ones.

For purposes of coaching, the observation is done in training and competition. On the other hand, performance in training and competition can be monitored in three ways:

- 1). Through physical fitness tests (Burke, 1990; Fardy, 1990; Kollath & Quade, 1995; Muckle, 1981; Malomsoki, 1995; Nagahama et. el.; 1995; Luhtanen, 1995),
- 2). Psychological assessment (Lawther, 1972; Tutko & Richards, 1971; Yaffe, 1975), and
- 3). Match analysis (Muckle, 1981; Reilly, 1995; Schmidt, 1991; Treadwell, 1995; Weber, 1991; Winkler, 1995). However, for purpose of this study, match analysis is the centre of interest.

Match analysis enables one to assess the technical and tactical strength and weaknesses of one's own team and the opponent's, and the performance of each individual player in a game situation (Schmidt, 1991; Treadwell, 1995; Weber, 1991). Thus, according to Hughes (1995), the use of subjective qualitative data together with accurate statistical analyses will make notation or match analysis systems more accurate and relevant to football with their diagnosis and predictions.

The need for accurate subjective forms of match analysis and their importance in the coaching process has led to considerable amount of research (Reilly, 1995). The early times of match analysis involved manual techniques of gathering data (Cohen, 1975; Ekblom, 1986; Muckle, 1981; Winterbottom, 1964; Yaffe, 1975). For example, the team manager of the England team used manual methods in 1958 to calculate the distance covered by players in a match. The same practice was conducted in Czechoslovakia (Muckle, 1981).

Additionally, Cohen (1975), Cratty (1981), Ekblom (1986), Muckle (1981), Stone and Kroll (1986) and Yaffe (1975) reported on some of the key actions in a soccer match including the number of shots at goal, tackles, fouls, throw-ins, crosses, jumps, duration of play, duration of individual movements in play, and the distance covered in a match by players. These reports are based on manual game analysis. Over time, however, the methods of data collection in a match situation have been

improved with the advent of computer and videotape technology (Mester, 1991; Weber, 1991). Through computer assisted video-feedback, it is now possible to evaluate performance of individual players and the team as a whole with regard to technical competency and tactical innovation; and to make limited inferences on physical capabilities and even the mental aptitude (Ali, 1995; Bochow, 1991; Boutmans & Rowe, 1991; Byshovets et al., 1995; Czwalina et al., 1991; Dufour, 1995; Gerisch & Reichelt, 1991,1995; Krauspe, 1991; Lanham, 1995; Luhtanen, 1995; Mosher & Partridge, 1995; Partridge et. al.,1995; Yamanaka et al.,1995). Apart from reducing the cumbersome nature of the manual game analysis, the latest technology facilitates immediate use of the information as well as improved accuracy (Krauspe, 1991). With computer technology it is also possible to analyze diverse variables simultaneously thereby getting a more detailed and comprehensive picture of a teams' tactical and technical behaviour on the field of play (Weber, 1991).

Results from these studies have contributed a lot towards the improvement of soccer. However, most countries in Africa and some in Asia, are not able to utilize the computer-assisted approaches to match analysis. There is therefore need for coaches in these countries to evaluate and objectively give feedback that will lead to improved performance (Njororai, 1993; 1996a). This study aims at comparing the technical and tactical performance of the national teams of Kenya, Germany

and Argentina; establish the variables that characterise the winning teams and also establish the level of accuracy of each of the soccer variables in a match.

## **1.2 SOCCER IN KENYA, GERMANY AND ARGENTINA**

### **A. KENYA**

The early British immigrants brought soccer to Kenya in the late nineteenth century. The game was introduced by missionaries, administrators, teachers and farmers (Versi, 1986). Competitive football, however, started in 1923 with the formation of the Arab and African Sports Association (Gishinga & Lukoye, 1983; Wepukhulu, 1989b). A Kenya select side toured Uganda in 1924, setting the stage for the inauguration of the Gossage Cup in 1926 involving both Uganda and Kenya. Tanzania and Zanzibar joined the annual competition in 1945 and 1947 respectively. In 1966 the cup gave way to the East Africa Challenge Cup and eventually in 1973 to the East and Central Africa Senior Challenge Cup (Gishinga & Lukoye, 1983; Versi, 1986; Wepukhulu, 1989b). This competition continues to be held on a biennial basis involving countries in the East African region comprising Eritrea, Djibouti, Ethiopia, Kenya, Tanzania, Uganda, Rwanda, Sudan, Burundi, Somalia and Zanzibar.

The Kenya Football Federation was formed in 1956 and had the inaugural Kenya Football League in 1964. The major clubs in the country include AFC Leopards, Gor Mahia, Tusker, Shabana, Mumias, Nzoia, Tellkom, among others. The game itself

has a large following throughout the country (Bhushan, 1987; Versi, 1986). The national team, popularly called Harambee Stars, has not performed as well as expected by Kenyans. The major achievements have been confined to winning the East and Central Africa Senior Challenge Cup four times in 1975, 1981, 1982 and 1983; qualifying for the Africa Cup of Nations' finals in 1972, 1988, 1990, and 1992, and the unexpected runners-up position to Egypt in the 1987 4th All Africa Games Soccer Tournament in Nairobi (Bhushan, 1987; Kenya, 1989; Ochieng, 1988; Okoth, 1993; Ouko, 1989; Versi, 1986; Wepukhulu, 1989a).

Generally, the national team has fared badly in World Cup preliminary rounds, Olympic-qualifying rounds and in the Africa Cup of Nations' Final tournaments. The team has also not won the East and Central Africa Senior Challenge Cup since 1983 (Okoth, 1993). Although there was a spirited attempt to qualify for the 1998 World Cup finals, these efforts ended with the loss to Nigeria on 7th, June 1997. Additionally, the loss to Namibia in the return match in Nairobi on 21st June 1997 killed off any chance of qualifying for the 1998 Africa Cup of Nations. The expectation of the public that Kenya was ready to line up a team at France, 98 and/or at the 1998 Africa Cup of Nations ended in disappointment.

The failure by the Kenyan team to excel in international competitions has elicited several negative views (Okoth, 1993; Omino, 1993; Versi, 1986). This study is aimed at analysing the technical and tactical performance of the national teams of

Germany, Argentina and Kenya; establish the variables that characterise winning teams and also establish the level of accuracy of each of the soccer variables.

Although no scientific study has been done to establish the reasons for the poor performance of the Kenyan national team in international competitions, sports journalists and administrators have expressed their views. For example, Versi (1986) lamented that Kenyan players had a great deal of potential despite the great disadvantages that they faced compared with some West African teams.

Versi (1986) identifies the problems that the Kenyan national team faces as follows: poor preparation for international competitions; lack of international visits to gain experience; and financial constraints. Other problems include haphazard residential training given the players' commitment to their clubs and at their places of work; lack of professional players as the case of Nigeria, Ghana, Cameroun, Zambia and the poor state of soccer administration. Omino (1993) blames the poor state of soccer on lack of a coaching programme that can ensure the national team evolves together. He also attributes poor performance in soccer to lack of investment in facilities and youth programmes, and cites government interference in the administration of the sport, lack of resources to mount serious programmes. More seriously are the lack of professional players and the lack of a coherent sports policy. The Weekly Review (1989) also cited the shortcomings in the Kenyan soccer in the following quotation:

... The sport has also been singularly prone to a variety of distractions as well as financial, administrative and political fiascoes that have retarded its development and prevented it from reaching standards achieved in other countries or scaling heights comparable to Kenya's achievements in athletics and boxing (p. 39).

All these observations are however, speculative. It is vital that a scientific study is undertaken to unravel the technical and tactical abilities of our national team so as to start addressing each inadequacy and to retain the strong points. The strengths and the inadequacies of the national team can be captured through a match analysis of the matches that the team has played in. Additionally, analysis of soccer matches played by Germany and Argentina, which have won the World Cup and excelled at their continental championships, will provide invaluable information to the development of soccer in Kenya.

## **B. SOCCER IN GERMANY**

The German Football Federation (Deutscher Fussballbund, DFB), is by far the biggest sports organization in Germany, having more than 5.2 million members (Gloede, 1982; Hoffman, 1992). Soccer is played by thousands of amateur clubs. As a spectator sport, it attracts hundreds of thousands to games every weekend. In 1979, West Germany was listed as a country with the second highest number of registered players behind Russia. This popularity has increased since the 1990 World Cup, in Italy, when the German team won the cup for the third time (Hoffman, 1992).

Germany was one of the first countries outside the British Isles where soccer was played under the association football rules (Gloede, 1990; Schilling, 1990). The approximate time of initial German participation in soccer is 1870 (Golesworthy, 1979). The early British and German connection with regard to the history of soccer in Germany was demonstrated in 1875 when a team from Oxford University visited Germany. The trip was the first official overseas tour by a soccer team (Golesworthy, 1979).

The earliest club to be founded was Hamburg S.V. in the year 1887. In 1900, the German F.A. was founded in Leipzig. In 1901, Aston villa from England played in Berlin followed by a German reciprocal visit to England in the same year. However, Germany's official representative international match was played in 1908, when they lost 3-5 to Switzerland in Basle (Golesworths, 1979). In 1929 and 1930, Germany played official international fixtures with Scotland and England respectively.

The game rapidly spread throughout the country. Many more clubs were formed. After World War II Germany was divided into East (Under communist influence) and West Germany (Under capitalist influence). For a long time German soccer was run by two associations, one each for West and East Germany. However, in 1989, the two countries re-united to form only one Association.

Germany had an early impact on the International soccer scene when in 1954, against all prediction; they won the World Cup at the expense of a well-drilled and artistic Hungary (Gloede, 1982; Schilling, 1990). Golesworthy (1979) observed that: -

Their (Germany) first victory in 1954 was achieved with a side of super-fit men who played real down to earth football without any frills. It is generally acknowledged that they were not as good a side as the Hungarians whom they beat in the final, catching them on an off-day in conditions which suited the Germans better than the more artistic Hungarians, but there is no denying that the Germans' effort was a remarkable one (p.88).

The German team has retained the will to win in subsequent World cup competitions. However, all has not gone their way. They did not fare well in the 1958 World Cup in Sweden and in the 1962 edition. In 1966 they lost to England in the final at Wembley. They were semi-finalists in 1970 and won the 1974 edition by beating a highly rated Holland team 2-1 (Gloede 1982, Schilling 1990).

The German success has been firmly established, if their performance in the 1982, 1986 and 1990 World Cup finals is anything to go by. In 1982 they lost 1-3 to Italy and in 1986, they lost 2-3 to a Maradona inspired Argentina in the final. However, in 1990, Germany regained their number one status by beating Argentina 1-0 (Versi, 1990). The success of the German team can be attributed to their outstanding soccer players such as Franz Beckebauer, Gerd Mueller, Karl-Heinz Rummennige and Lothar Mathaeus among others (Nesslinger, 1982; Schumacher, 1987). The German national soccer team has also demonstrated superior technical and tactical understanding in major international tournaments. For example,

Germany was rated highly during the 1990 world cup due their efficiency in passing, offensive play, and crossing of the ball, tackling, defensive organization, goal-keeping, shooting and execution of set piece situations (Luhtanen, 1995).

Other key ingredients for the success of the German national team are the fighting spirit, physical strength, efficient play, fine team spirit, the will to win and the ability to crack through a defense (Nepfer, 1995; Uefa, 1996). The national team tends to play with a strict team structure, with well-defined tasks and functions. Some of the positive elements of the team include the will to win by every player, solid defense, excellent goal-keeping, world class defenders, creative mid-field players, gifted goal scorers and the over-all tactical understanding (Uefa, 1996). The team uses a flexible 5-1-2-2 system, and relies on physical strength, strict organization and efficiency to stifle out talented opponents. The team relies on balance in defense, creativity in the construction area and powerful and accurate shooting in front of goal (Uefa, 1996).

In addition to the undoubted success of the soccer team and even in other sports' disciplines, Germany is a powerful industrial nation. Its vast technology is now being utilized to develop and improve sport. The use of computer and video feedback to evaluate team and individual performances in soccer is widely used in this country (Gerisch and Reichelt, 1991b). By studying its form of play, it is hoped

that useful tendencies and hints will emerge that could go a long way to improve soccer in Kenya.

### **C. SOCCER IN ARGENTINA**

The game of modern soccer was introduced in Argentina by the British in the 1860's when the latter were engaged in the building of railway lines in that country (Golesworthy, 1979). The first official soccer club was Buenos Aires Football Club, which was formed by the British residents in 1865 and to date, it remains the oldest soccer club in that country. The earlier efforts of the British in establishing soccer in Argentina received a boost from the Italian immigrants who invested in the development of the game. The Argentinean Football Association was founded in 1893, when the British influence was quite strong. The trophy donated by Sir Thomas Lipton in 1902 to be competed for annually between Argentina and Uruguay served to retain the interest in the game both locally and internationally (Golesworthy, 1979).

Soccer in Argentina hit the international headlines when in 1928 the national team reached the final of the Olympic games soccer tournament, managing a draw 1-1 with Uruguay before losing the replay 0-2. Argentina again proved their strength by reaching the final of the inaugural World Cup in 1930, but lost to Uruguay again (Golesworthy, 1979; Gloede, 1990; Schilling, 1990). After the World War II, Argentina had lean times when they were eliminated early in the 1958 and 1962

World Cup finals. The soccer passion in Argentina reached breaking point as the citizens demonstrated violently against the Local Football Association. When in the 1966 World cup, England eliminated Argentina 1-0 at Wembley, the Argentinean Captain was so upset that he refused to leave the field for seven minutes after he was ordered off by the referee (Golesworthy, 1979).

In 1970, they failed to qualify for the finals only to bounce back reaching the quarterfinals of the 1974 World Cup tournament in Germany. Since then the fortunes of the Argentina team have been on the upswing. In 1978, they won the World Cup title held in Argentina. In 1982, they were, eliminated early with their newfound star, Diego Maradona, being roughly treated by the opponents. The rough and brutal treatment to Maradona could not however stop him from steering his team to the World cup Victory of 1986 in Mexico. In 1990, Maradona once again led Argentina to the World cup finals only to lose to a United Germany team (Hoffman, 1992; Versi, 1990). In February 1993 the Argentinean Football Association celebrated its 100 years of existence. During the celebrations they played an international friendly match with their Latin American bitter rivals, Brazil. The match was drawn 1-1. Thus Argentina is a soccer super power in the world.

From a technical and tactical standpoint, consistency, individual talent and homogeneity have characterized Argentina's national teams. For example, their youth team, which plays the same style like the senior team, won the 1995 and

1997 editions of the World Youth Championships in Qatar and Malaysia respectively. In both tournaments, the team played with sound defense; creative mid-field and well built-up attacks (Nepfer, 1995, 1997). The individual players were well equipped technically with regard to dribbling, tackling, accurate passing, and over-all effective defensive organization. Additionally, the aerial superiority, effective tackling and set pieces all blended into a superb tactical understanding.

According to Nepfer (1997), the hallmark of the Argentine team that won the 1997 World Youth Championship was their team spirit, tactical maturity and good individual skills. The team enjoyed more ball possession (75%) compared to her opponents, created most attacks, though they were not effective at finishing.

During the 1996 Olympic soccer tournament, Argentina lost the final to a superb Nigerian team. However, the team was equally strong in physical, tactical and mental terms (Nepfer, 1996). Their tackling was uncompromising, their understanding good, and attacks were started quickly and efficiently. Offensively, the team played with width using the two wings, where the wingbacks were prominent. However, the many crosses delivered to the Centre did not yield much. Their passing of the ball was accurate except the crosses and the shooting in front of goal. Their failure to convert chances and occasional lapse in concentration allowed Nigeria to score the winning goal in the final (Nepfer, 1996).

Although Argentina's senior team has not enjoyed much success in the 1990's as they did in the 1970's and 1980's when they won the World Cup in 1978 and 1986 respectively, their youth teams have excelled. They won the 1995 and 1997 editions of the World Championships as well as being runners-up at the 1996 Olympic Soccer tournament.

### **1.3 THEORETICAL BASE OF THE STUDY**

National teams that rank among the top in the world of soccer are those that have excelled in competitive matches at international level. Some of the international competitions where teams aim to excel in include the World Cup Soccer Tournament; the Continental Championships including Union of European Football Associations, Africa Cup of Nations; South American Championships, among others. For a team to excel in any of these tournaments, it has to prepare adequately to outplay the opponents all the way to win the championships. Such winning teams display a mastery of the technical and tactical aspects that puts them above the rest of the teams. Thus the technical and tactical preparedness of a team plays a critical role in the performance on the field of play.

Individual and team preparation demand that time be spread out on perfecting the team and group techniques and tactics, individual techniques and the fitness of the players (Wade, 1970). The team and group skills are developed through training, whereby emphasis is laid on systems of play and general tactical awareness; small

sided games for mastery of principles and group tactical possibilities; functional training for group understanding and tactical practice for mastery of set plays in specific phases of the game. Individually, the acquisition and mastery of new techniques is a priority (Wade, 1970; Winterbottom, 1964). However, the acquisition and mastery of techniques in practice is meant to be applied in competition. It is possible for a soccer player (or any other) to develop a high degree of technique in ball manipulation, yet fail to perform at comparable level in matches (Tutko & Richards, 1971; Wade, 1970).

All forms of sport involve achievement and goal oriented behaviour (McPherson et.al 1989). The practice situation is geared to preparing players to effectively play assigned roles within a team with a view of achieving certain goals. This is so because every sport situation offers various forms of contest and self-testing. This is evidenced by the concern of coaches, players, spectators and sports scientists with attributes of ability, competence, effort, degree of difficulty, mastery and performance. According to McPherson et. al. (1989), it is for this reason that detailed individual and team performance statistics are recorded and reported. Some performance statistics in soccer pertain to the various techniques and tactics that are displayed in a match.

The key techniques that affect a team's level of performance include passing, kicking, heading, ball control, dribbling, tackling, throw-in and goal keeping. Some

of the tactical elements include off-side trap, set pieces, ball possession, crosses, creating scoring chances, attacking methods, shooting, shooting zones, ball distribution, positional responsibilities, defending and attacking principles (Batty, 1969; Byshovets et al., 1995; Jinshan et al., 1995; Lanham, 1995; Luhtanen, 1995; Partridge et al., 1995; Wade, 1970; Winterbottom, 1964). Although the technical-tactical aspect of performance in soccer appears complex, it is possible to analyze it through observation (match analysis). This method makes it possible to determine the important factors (technical-tactical) and their interrelations during play (Singh, 1982).

This study, therefore, used match analysis to establish the technical and tactical performances in matches involving the national teams of Kenya, Germany and Argentina. Kenya was chosen for the study because her national team has persistently failed to excel in international competitions, while Germany and Argentina have been world cup winners in succession. Techniques and tactics have a major role to play in a team sport such as soccer. Soccer, being a universal sport, is played under a uniform set of laws and the techniques of the game are also relatively the same all over the world. Training focuses on improving a team's performance. Hence it is worthwhile to establish the characteristics of performance for different teams so as to identify areas of strength and weaknesses with a view of enhancing over all performance.

Evaluation of performance facilitates an objective judgment of the effectiveness of the training process (Muckle, 1981; Reilly, 1995; Schmidt, 1991; Singh, 1982; Treadwell, 1995; Winterbottom, 1964). During training each player gets instructions relevant to his role and ability. For some players, some techniques and their variations receive more emphasis than others (Mal, 1982) do.

#### **1.4 STATEMENT OF THE PROBLEM**

Match analysis in soccer has been in use for a long time. However, no study has analysed performance of the national soccer team of Kenya as well as that of soccer giants such as Germany and Argentina. This study focused on identifying the differences in technical and tactical performance of the national teams of Kenya, Germany and Argentina using competitive international matches drawn from their respective continental competitions and World Cup levels. Additionally, the study aimed at identifying the variables that characterise winning teams as well as establishing the level of accuracy of each of the soccer variables in a match. Whereas Argentina and Germany have been world cup and continental winners in the recent past, Kenya has not achieved much.

#### **1.5 RESEARCH HYPOTHESES**

There is no difference in the technical performance of the national soccer team of Kenya, compared to that of Argentina and Germany.

## **SUB-HYPOTHESES**

- a. There is no significant difference in the performance of the national teams of Kenya, Germany and Argentina on the following variables;
- i. Passes
  - ii. Goals
  - iii. Off-sides
  - iv. Corners
  - v. Throw-ins
  - vi. Goal attempts
  - vii. Crosses
  - viii. Headings
  - ix. Free kicks
  - x. Goal kicks
  - xi. Tackles
  - xii. Preferred side of attack
  - xiii. Fouls
  - xiv. Injuries
- b. There is no significant difference in the performance of winning and losing teams on technical variables (a. I-XI above).
- c. There is no significant difference in the effective execution of the various technical variables (a. I-ix above) by the national teams of Kenya, Argentina and Germany in international competitions.

- d. There is no significant difference in the effective execution of the technical variables between winners and losers (I-XI).

## 1.6 RATIONALE

The development of the game of soccer into one of the fore-most sports has had a great boost from the world of science and technology. As a scientific undertaking, it behooves the coach and other technical committee personnel to conceptualize their team roles from a scientific perspective. Some of the current critical areas where the hand of science cannot be overlooked are the fitness testing of the players, the periodisation and prioritization of training schedules and more so the analysis of the individual and team performances.

To facilitate an objective conceptualization of football in a scientific perspective the following key points advanced by van Lingen (1995) are crucial:

- I). The coach has to formulate the football problems and make the connection between theory and practice.
- ii). The analysis of football cannot be expressed as it is in the physiological terms of stamina, power, speed or pliancy. Speed for instance, is always related to fellow players or opponents.
- iii). Coaches should analyze football in such a way that a workable method can be developed in favour of the process of learning, maintaining and improving football skills and based on the reality.

- iv). In order to be able to make use of scientific knowledge, the coach has to make a correct diagnosis of the problem.
- v). In order to teach players to improve their play, it is essential that the coach is able to make the problem understandable and visible.
- vi). To realize good football training a coach has to formulate the football problem properly. Vital elements of the problem include:
  - a). What is going wrong in relation to the football intentions,
  - b). Who is (are) playing the main role and in which field positions,
  - c). At what moment does the problem occur,
  - d). On which part of the field does it take place,  
and
  - e). Specific elements related to the players, the game and/or the circumstances.

The above key points can only be addressed effectively when data is kept and closely analyzed. Data that is kept can be used in the long run or short basis. Some countries that have advanced in soccer have already incorporated the computer and video technology in providing data to enhance the half time pep talk apart from the long-term use. Gerisch and Reichelt (1995) have devised a method of conveying the information derived from match analysis in graphical form, allowing coaches to extract vital information at a glance. The programme prepares graphs showing overall and individual results, plotting them on a time scale and

thus giving a representation of the actual development of the match or of the individual players' performance throughout the game. The development of chances on goal, stronger and weaker phases of a team and the dynamics of fouls are shown in easily readable graphs. A team's weak points are pointed out and insufficiencies in certain skills are detected. It is fitting to note that the German Bundesliga clubs are using this method of analysis on a regular basis (Gerisch & Reichelt, 1995). However, countries with less economic resources to acquire computer technology can utilize a manual system that is easy to tabulate and apply for purposes of enriching the feedback to the players and coaches.

The figures that pass unnoticed when teams play matches could be turned into a useful instrument to assist in preparing for future matches. Lanham (1995) reports that there are the same patterns of chance that occur repeatedly over a series of games regardless of the level and place of competition.

### **1.7 ASSUMPTIONS OF THE STUDY**

The following assumptions were made pertaining to the study:

- a). Competent referees guided all the International Soccer games.
- b). The pre-recorded videotapes of the live transmission matches did not omit any vital aspects of the game.
- c). The National teams were well trained and ready for the encounter.

- d) A national team was composed of the best players in the country on the basis of current form.

## **1.8 LIMITATIONS**

The following limitations were noted with regard to the study:

- a). There was no attempt to establish the training programmes prior to a team engaging in a specific game.
- b). Some of the national players of the countries used in the study play professional soccer in many countries besides their own.
- c). The study did not focus on the partisan support that a team playing got from its followers.

## **1.9 DELIMITATION**

The study focused on analysing matches played by the national teams of Kenya, Argentina and Germany in the preliminary and final round of the World Cup soccer tournament and the respective Continental competitions. The matches analysed are those played between 1988 and 1996. Only the matches available on unedited and pre-recorded videotapes were considered. Additionally, the study dealt with only the technical and tactical variables contained in the match observation instrument (appendix A).

## 1.10 DEFINITIONS

- a. Match analysis- a qualitative and quantitative assessment of techniques and tactics in a game for the purpose of identifying players' or teams' strengths, weaknesses and style of play.
- b. Tactic- play activities and situations whose purpose is to outplay and outscore opponents. These include preferred side of attack, offside, set pieces, goal attempts, and crosses among others.
- c. Quantitative evaluation- objective evaluation in which a test has a clearly defined scoring system. For example, throw-in, goal attempt, corner, cross, heading, free kick, goal kick, pass, penalty, tackle, preferred side of attack, goal, offside, injury, caution, substitution and foul.
- d. Qualitative evaluation- evaluation which has no quantifiable scoring system. For example, goal keeping, defensive play, midfield, offensive play, tempo of the match, ball reception, and fatigue.
- e. Successful technique- is one that reaches the right player (teammate) in the right space at the right time.
- f. Technique- the skills related to passing, heading, throwing, and kicking, in a competitive match with the intention of winning against the opponent.
- g. Unsuccessful technique- when the ball was either intercepted, went out of play, lost it to an opponent in a tackle, or fouled another player while in possession of the ball.
- h. Fatigue- tendency to slow down in one's general activity levels in a match.

- i. Defense- a team's way of play and implementation of the principles governing defensive play, including depth, balance, ball possession, delay, restraint, and concentration.
- j. Midfield- link between the defense and the offense. It involves marking, tackling, and creation of attacking moves and supporting both the defense and the attack.
- k. Offense- attacking play guided by the principles of depth, ball possession, penetration, width, mobility and improvisation.
- l. Tempo- the pace of the match as well as the deliberate effort by one team to vary it to its own advantages i.e. Counter attack or fast break, and slow build-up.
- m. Ball reception- creating space and using it to receive passes and using them to the advantage of the team.

## **CHAPTER TWO**

### **REVIEW OF LITERATURE**

#### **2.0.0 INTRODUCTION**

This chapter is divided into the following sections: factors that determine Performance in sport; match analysis; match analysis in soccer and summary.

#### **2.1.0 FACTORS THAT DETERMINE PERFORMANCE IN SPORTS**

In modern sports, the emphasis on winning and the competitive spirit of the participants demands a high level of physical and psychological conditioning as well as refined technical-tactical preparation of the individual player (Singh, 1982; Wade, 1970).

In soccer, the physical aspect is expressed in the fight for possession of the ball, running off the ball, dribbling, tackling, counter attacking, overlapping, jumping to head the ball and long tactical kicks. All these demand a high level of fitness in the players (Reilly, 1979, 1981, 1995; Stone and Kroll, 1986). On average, a soccer player covers a distance ranging between 8 to 14 kilometres (Ekblom, 1986; Reilly, 1981, 1995; Muckle, 1981; Wade, 1970; Winterbottom, 1964; Withers et. al., 1982).

Thus, the elements of physical fitness that the training programme should target include aerobic and anaerobic endurance, coordination, speed, agility, flexibility,

muscular strength and endurance (Ekblom, 1986; Stone & Kroll, 1986; Wilmore & Costill, 1988). Physical condition can be evaluated through Laboratory and field tests (Kollath & Quade, 1995; Muckle, 1981; Malomsoki, 1995; Wekesa & Asembo, 1993a, b). Laboratory methods measure exact loads and easily controlled (Kuhn, 1995; Rost et. al., 1987; Winkler, 1995). Field tests on the other hand are standardized to varying degrees in relation to the established criteria (Boes, 1987). These methods address themselves to specific variables of fitness such as VO<sub>2</sub> max, lactate, sprinting ability, reaction time, strength, flexibility, etc (Kuhn, 1995; Muckle, 1981; Winkler, 1995).

Although each player is uniquely motivated to compete, those who are successful compose a very select group of people. The latter have their own unique traits in addition to their physical talent (Tutko & Richards, 1971; Whiting, 1979). According to Tutko & Richards (1971) and Whiting (1979), the personality traits that relate to high achievement include: drive, determination, intelligence, aggression, leadership, organization, coachability, emotionality, self-confidence, mental toughness, responsibility, trust and conscience development. Muckle (1981) mentions the following four basic traits in successful players:

- I). A high need for achievement and set high but realistic goals for themselves and others.
- II). Well organized and orderly, with a high respect for authority.

- III). A large capacity for trust, great mental endurance, self control and low resting levels of anxiety but with moderate aggression.
- IV). Low interest in receiving support and concern from others and a low need for affiliation (p.91).

Apart from the physical and technical dimensions, the psychosocial dimension is vital in achieving good performance (Singh, 1982). The unique personality factors that one is born with and those that result from up-bringing (environmental influences) have a role to play. In a team sport such as soccer, the abilities of different players have to be molded together before contests can be engaged in. Given the uniqueness of each individual player and the different ways in which one has been socialized, it requires a discerning mind to design programmes to fully develop individual personalities and a winning team (Singh, 1982). The evaluation of the personality traits of individual players is done through standard psychological tests as well as the observation method (match analysis).

The other critical factor in performance is the technical-tactical component of training. Individual and team preparation demand that time be spread out on perfecting team and group techniques and tactics, individual techniques and fitness of the players (Wade, 1970). The team and group skills are developed through training, whereby emphasis is laid on systems of play and general tactical awareness; mastery of principles and group tactical possibilities; functional training

for group understanding and tactical practice for mastery of set plays in specific phases of the game. Individually, the acquisition and mastery of new techniques is a priority (Wade, 1970; Winterbottom, 1964).

The acquisition and mastery of techniques in practice should be competition oriented. It is possible for a soccer player (or any other) to develop a high degree of technique in ball manipulation, yet fail to perform at comparable level in matches (Tutko & Richards, 1971; Wade, 1970). Key techniques that affect a team's level of performance include passing, kicking, heading, ball control, dribbling, tackling, throw-in and goal keeping. The tactical elements include off-side trap, set pieces, ball possession, crosses, creating scoring chances, attacking methods, shooting, shooting zones, ball distribution, positional responsibilities, defending and attacking principles (Batty, 1969; Byshovets et. al., 1995; Jinshan et. al., 1995; Lanham, 1995; Luhtanen, 1995; Partridge et. al., 1995; Wade, 1970; Winterbottom, 1964).

Technical-tactical aspects of performance in soccer can be analyzed through observation. Match analysis makes it possible to determine the important factors (technical-tactical) and their interrelations during play (Singh, 1982). Through analysis, evaluation of performance can be done resulting into an objective judgment of the effectiveness of the training process (Muckle, 1981; Reilly, 1995; Singh, 1982; Winterbottom, 1964). During training each player gets instructions relevant to his role and ability (Mal, 1982). Thus Physical condition, psychosocial

and technical-tactical factors all influence performance in soccer. Whereas the first two can be assessed using standard tests and to a limited extent through observation, the third one can be evaluated exclusively through observation of training or competition. However, all these aspects have to be developed in players within a team so as to bring about maximal performance.

Sports performance realized in competition is an expression of performance capacity. This performance capacity is divided into performance reserve which involves the totality of motor abilities, techniques, tactics and mental capabilities, and performance readiness which involves motivation, drive, etc. (Singh, 1982). Thus performance is not only the result of motor and technical-tactical abilities, but also the ideals, beliefs, interests, motivation, moral qualities and personality traits that have their basis in the psychological and social capabilities of the sports-person. Hence sports performance is the result and expression of the total personality of the person (Singh, 1982).

Kunath in Singh (1982) argued that "sports performance in international competitions and tournaments not only denotes the high level of efficiency of an individual sportsman but also gives expression to the overall efficiency of a nation, "society and culture" (p.4). The countries that produce medal winners at major international competitions also have political, economic, social and cultural conditions which are indispensable for producing world champions (Singh, 1982).

The absence of conditions which act as a medium in which sports training can be effectively carried out minimizes the achievements at a high level sports competition (Singh, 1982). In athletics, for example, world champions produced by the former East Germany and Russia are not only the product of their coaches but as much of the societies, cultures and political systems to which they belong. Thus sports performance at top level depends on various factors, which Singh (1982) grouped as follows;

- a. Constitutional factor e.g. height, weight, physique, stability and strength of the skeletal system.
- b. Condition factor e.g. strength, speed, endurance and their combination.
- c. Technique coordinate factor e.g. technique efficiency, coordinate abilities;
- d. Tactical factor e.g. tactical abilities and skills.
- e. Character and ideological factor e.g. beliefs, values, psychological factors, personality traits, drives, interests, etc.
- f. External factor e.g. equipment, facilities, opponents, and sports programmes etc (p.7).

The above factors can also be broadly categorised as internal (constitutive, condition, technique, tactical, and character factors) and external factors as the former relate to the individual sportsman while the latter are external to the person. The training process is geared towards developing internal factors, while external factors, which affect all the internal ones, are organizational in nature, external to the sportsman. For high level sports performance, it is vital that the

external factors are well streamlined to facilitate an appropriate and effective training process. Technical- tactical aspects form a major component that training process should target for improvement both in practice and competition. Through match analysis, aspects that require improvement or maintained are identified.

## **2.2.0 MATCH ANALYSIS**

Match analysis is a useful tool of comparing pre-determined objectives with actual performance and results (Trapp, 1991; Mester, 1991; Weber, 1991). Well kept records of a team and individual players provide the technical staff and players with vital information as well as acting as a motivating force (Trapp, 1991; Banister & Wenger, 1982). Regardless of the sport discipline, records facilitate objective planning. Such records are vital in attaining three objectives

- a) Short term- correcting mistakes between two matches,
- b) Middle term- guiding the coaching work, and
- c) Long term- creating a data bank about a championship over several seasons (MacDougall et. al., 1982)

A comprehensive, objective and precise diagnosis of players' performance in training and competition is pre-requisite for proper planning and implementation of optimum training as well as successful match play (Winkler, 1995). Match analysis has a major role in competition as it provides a relatively objective view of the level and cooperation of individual performance factors within the complexity of a match

situation. Based on the realistic data of the game, the coach and the player get quick and reliable information for the training and competition process with a view of optimizing performance. However, match analysis can only be used in optimizing performance, if the coaches strive to discover ways and means of making improvement. The data provides a basis for analyzing an individual's and a team's performance within a broad perspective. What is good should be retained and developed further while what is bad should be improved (Winkler, 1995; Winterbottom, 1964).

In all sports, performance analysis utilizes either manual analysis or computerized video feedback analysis. Even the use of film in major sports such as American football was vital to effective coaching and performance (O'Brien, 1987). In closely contested competitions such as the 100 metres final, photo finish by use of electronic images to determine the winner is already in place. The latest technology makes it possible to know the winner at every stage of the competition. In the 100 metres final of the world championships in Tokyo in 1991, a line scanning video camera system was used to place and record the times of each competitor (Velzian, 1991a,b).

In Athletics for example, performance statistics in the form of lap times have been used in training and actual competitions (Velzian, 1992). Track coaches, are constantly concerned with pace-time taken by an athlete to cover a given distance

at the same speed (Velzian, 1992). In other games such as Basketball, match analysis has been part of the evolution of the sport. It involves recording of the field shots, free shots, goal assists, interceptions, fast breaks, and even goal attempts (Elbel & Allen, 1941; Verderame, 1967; Schmidt, 1991).

Winkler (1995) and Treadwell (1995) assert that a modern day coach cannot afford to refrain from taking advantage of match analysis tools both in training and match play in order to enhance performance. In a game such as Rugby, patterns of play from a series of match recordings to distil out regular game features, particularly those associated with winning and losing have been derived (Treadwell, 1995). The derived game features can then be included in coaching programmes and players' future performance can be monitored. Treadwell (1995) for example designated over forty different action variables in the game of rugby football. The data was captured live via off-air video-recordings. The data was analysed using chi-square tests of independence to compare frequency counts of each variable of the Welsh National Senior Rugby team matches of the five nations' championships, world cup and friendly matches. He pointed out that the game itself provides a rhythm for prediction. In the same study, it was found that game models were clearly tenable regardless of weather, selection, refereeing or coach style (Treadwell, 1995). In addition, analysis allowed constructs to be formulated concerning the nature of rugby play at international level. Also clear physiological rhythms and strategic patterns emerged from the analysis, which were logged and

formed the basis of special dossiers, presented to national coaches and players in order to improve coach and player effectiveness (Treadwell, 1995).

The objective in all sports is to prepare teams that can win various competitive matches. It is the desire of every coach to identify the main techniques and tactics that are crucial in enhancing winning. Thus Asembo and Njororai (1995) analysed the effectiveness of the offensive penalty corner during the 4th Africa Cup of Nations Field Hockey Championships in 1993. There were a total of five national teams (Kenya, Seychelles, Egypt, Zimbabwe and South Africa) that played ten matches. Among other findings, it was noted that out of the 130 penalty corners awarded only 27 (20.8%) were successful while 103 (79.2%) were unsuccessful. More penalty corners were observed in the second half (51.5%) than in the first half (48.5%). Kenya's national team earned the highest (33.1%) compared to 28.5% and 22.4% for South Africa and Egypt respectively. However, South Africa had the highest proportion of the successful penalty corners (48.2%) followed by Kenya (22.2%), Egypt (18.5%) and Zimbabwe (11.1%). It was observed that out of the 72, goals scored in the championships, only 16 (22.2%) resulted from penalty corners. There were, on average, 13 penalty corners per match yielding 1.6 goals. Such a high inefficiency rate may also apply to the game of soccer where offensive situations such as corner, penalty kick, cross, and goal attempts are prevalent. The above study also shows that it is possible to discern differences in the technical and tactical approach to the game by different nations.

Mwisukha (1997) looked at the effectiveness of Kenya's top men's teams in using offensive tactics of passing and shooting with the drive, push, flick and scoop, corner and penalty corner in competition. The objective of the study was to identify the strengths and weaknesses of the teams in executing the offensive tactics. The researcher endeavoured to determine if winning resulted from the team's effectiveness in executing the offensive techniques and tactics. The results showed that teams that won achieved higher success on the passes using the drive, push, flick and the scoop compared to the losers. Additionally, the winning teams realized higher proportions of successful shots with drive, push and flick, corner and penalty corner.

In the game of netball, Kerubo (1996) investigated whether passes, interceptions, centre pass patterns and shooting techniques influence the outcome of matches played by Nairobi province teams in Kenya. In the study twenty-four matches were analysed with a view of establishing the differences on various performance variables between winners and losers. The independent samples t-test was used to analyse the difference between the two groups. The results showed a significant difference between the two groups ( $p < .05$ ) in both successful and unsuccessful passes, successful and unsuccessful direct centre pass pattern, successful stationary shooting, unsuccessful interceptions and unsuccessful indirect centre pass patterns. However, there was no significant difference between the two

groups in both successful and unsuccessful in-motion shooting, successful interceptions and unsuccessful stationary shooting. The success rate of the passes was 77.4%. Though the studies by Kerubo (1996) and Mwisukha (1997) were carried out in Kenya, they focused on games other than soccer. Secondly, the variables observed were few and the studies dealt with clubs at national level only.

In soccer, Dufour (1995) argues that the use of computer assisted video feedback and a specific algorithm for the statistical treatment facilitates an evaluation of the players and the team physically, technically and tactically. Luhtanen (1995) maintains that the efficiencies of the offensive actions in soccer can be established through match analysis. On a wider scale, match analysis provides an avenue to compare the match actions involving different teams and by extension regions of the world. Through the analysis, distinctive features of a particular team or country can be isolated. Thus Yamanaka et. al. (1995) analysed the playing patterns of Cameroun in the 1990 soccer world cup and concluded that, despite its seeming similarity to South American Football, there were significant differences in styles. This is to show that Cameroun had developed their own pattern. Similarly, a study of the national team of Kenya would reveal its pattern when compared to other established soccer playing nations such as Argentina and Germany.

## 2.2.1 MATCH ANALYSIS IN SOCCER

Match analysis in soccer has been done either manually or with computer and video assistance. It is used to evaluate the technical, tactical and psychological elements of performance. Such an evaluation facilitates an objective feedback to the players and coaches with a view of enhancing performance. Through feedback, it is possible to correct mistakes and to sustain the desirable performances or behaviour.

The appreciation and application of match observation as a helpful way of building a successful team was pioneered in the 1870's. According to Batty (1969), the England team changed their tactical deployment of players after drawing with a tactically superior system of the Scotland team in a friendly match in 1872. Since that time, the evolution of the systems of play in soccer namely: 2.3.5, WM, 4.2.4, 4.3.3, 4.4.2, 1.4.3.2, 3.5.2 etc. have been based on careful analysis of matches with a view to improving performance.

The initial analysis that focused on the deployment and roles of the individual players later led to the isolation of specific aspects of the game such as the success rate of the throw-ins, goal kicks and goal keepers clearances (Winterbottom, 1964). These in themselves are tactical devices that a coach can lay emphasis on in

training based on the feedback derived from match observations (Trapp, 1991; Winterbottom, 1964).

Apart from the tactical aspects, individual and team efforts were also measured in terms of sprinting, jogging and the overall distance covered in an average game (Ekblom, 1986; Muckle, 1981; Wade, 1970; Winterbottom, 1964; Withers et al., 1982). Winterbottom (1964) analyzed the distance covered by plotting the movement of players on cards during a game. The plotting reflected whether one was running at speed or jogging. A soccer player covers a distance ranging between 8 to 14 kilometres on average (Ekblom, 1986; Muckle, 1981; Wade, 1970; Winterbottom, 1964).

Apart from the distance covered which has implications for the physical preparation of a team, the effort of individual players and general team superiority could also be monitored through the ball contacts made (Winterbottom, 1964). The contacts could be as diverse as kicking, heading, controlling, tackling, etc. Such figures give an indication of the number of times a player is able to use his skill. Although the data did not specify the weak aspects of play, it did demonstrate the need for varying training to suit the functions of the different positions (Winterbottom, 1964; Muckle, 1981; Wade, 1970).

The frequency of lofted balls during matches received early analysis. Winterbottom (1964) reported counting 516 times that the ball was lofted in ninety minutes of soccer action. In addition, the rate of success of accurate sequential passes of 3 or more amongst members of a team (possession) and the frequency of shots at goal also were considered. From such analysis, though narrow in scope, specific inferences could be made for purposes of incorporating pertinent changes in training.

In soccer contests, the mastery of the technical and tactical elements is essential (Cohen, 1975; Creek, 1970; Wade, 1970; Winterbottom, 1964). Cohen (1975), therefore, manually analyzed variation in performance basing on the films of the 1966 World Cup games. He noted the following:

- I). The proportion of successful attempts to score goals is much greater within than it is outside the penalty area. The data itself revealed that outside the penalty area, 554 attempts were made of which a mere 9 were successful. From the analysis, he concluded that one in six attempts was successful inside the penalty area, but one in 62 attempts outside the penalty area.

The results were in accord with those derived from the analysis of the 1956 and 1960 European Cup Finals. In the two matches there

were 13 successful attempts from the penalty area out of 31 unsuccessful ones. Outside the penalty area, the figures were one in 31 attempts.

- II). That the difference between winners and losers is not related so much to what they do outside, as to what they do inside the penalty area. According to the author the winners make more attempts than the losers do to score inside the penalty area. Using 27 matches, he established that the ratio of attempts by the winners to attempts by losers is much bigger inside than outside the penalty area.

It was, therefore, concluded that it is the play within the penalty area that counted more decisively to the outcome of a match. That pattern was confirmed using the 1956 and 1960 European Cup Finals. The combined goal attempts were 28 within the penalty area for winners and 16 for losing teams. While outside the penalty area, winning and losing teams both made 16 attempts.

- III). That the team leading at half time was more likely to win compared to the trailing team. Using the 1966 World Cup matches, 17 out of 27 decided matches, the winners led at the end of the first half.

Although the analysis by Cohen (1975) is not backed by sophisticated statistical tests to determine the significance of the differences, it provides useful information that can be used in training to sharpen on the play in the penalty area, first half and the point of accurate shooting.

Muckle (1981) has attempted to analyse certain match actions in soccer. In the study, four aspects of the game were considered for comparative reasons: the duration of play, the duration of individual ball play, movements in play, and the total distance covered in a match. Accordingly, the effective average playing time for a match in soccer is 59 plus or minus 5 minutes. This finding was based on an analysis of English first and second division matches. This is lower compared to the average of 62 minutes 26 seconds that were observed in the 1978 World Cup in Argentina (Lover, 1986). The differences may be due to discrepancies in the quality of play at world cup level and national leagues. In addition, he also noted that the longest game lasted 68 minutes 22 second while the shortest was 54 minutes 22 seconds. The short time of play is attributed to the high frequency of stoppages for injuries, substitution, free kicks, goal-kicks, corner kicks and throw-ins (Lover, 1986). For example, there were on average, 108 and 113 stoppages in the 1982 and 1978 world cup games respectively (Lover, 1986). According to Muckle (1982), the games with players of high level technique and flair last longer in actual playing time. He thus observes that "there is a direct proportional relationship between

match play and spectator enjoyment i.e. the longer the game flows the more excitement it engendered" (P.13).

Thus a team with a high occurrence rate of throw-ins, goal kicks, free-kicks etc. ends up playing a shorter time. The other aspect that has been observed is the duration of individual ball play. It has been found that an individual holds the ball for a total of 80 - 100 seconds on average in a match. The actual contact with the ball varies from a fraction of a second e.g. a wall pass to a dribble of about 10 seconds. However, it requires exceptional technique for a player to hold the ball for 3-5 minutes in a match. Thus a large part of the time is spent on running without the ball. With such an observation the coach would then lay emphasis on what players do when not in contact with the ball. Time without the ball should be spent fruitfully.

Regarding movements in play, Muckle (1981) remarks that 10-20 percent of the players running pattern may be backwards or sideways especially the defender. It is, therefore, vital that training must reflect this variety of running patterns and in the right proportion.

Other aspects of movement whose data from actual matches have been reported include fall episodes, jumping and throw- in actions (Muckle, 1981). Such data enables the coach to selectively prescribe certain physical, technical and tactical

activities for various players in line with the frequency of involvement in particular movements. Regarding the players' positions, Muckle found that goalkeepers cover the shortest distance in a match (2000m), with 5 - 10 percent of their time in possession of the ball. They also throw the ball 8 times and kick approximately 59 times. Given the diving, jumping, kicking, throwing and sudden movements that they make, their training should be as specific as possible.

The defenders, mid fielders, wingers and strikers should all be given specific training that reflects their roles in a match. That is only possible if the coach observes and records the role demands in terms of technique and tactics for purposes of designing effective training programmes. Muckle (1981) observes that "the basic data must be known to plan training schedules so that players can carry out meaningful activities which have a direct bearing on match situations" (P.22).

Eklom (1986) has made observations regarding the technical actions in a match. According to him, a soccer player averages 14 tackles and 9 headings respectively in a game. He observed that although the figures applied to top soccer in Sweden, Germany and Australia, those in Britain were higher (19 and 13 respectively). The author concluded that there seemed to be a higher number of tackles and headings in international games than in National league games.

Njororai (1996b) studied the frequency of occurrence of throw-ins, headings, crosses, goal attempts, goals, free kicks, goal kicks, corners, off-sides, injuries, penalties and substitutions in the 1994 World Cup Tournament. Among other findings, it was revealed that the average occurrence for each variable was as follows: throw-ins (41.7), headings (73.8), crosses (30.6) free kicks (30), goal attempts (20.2) corners (10.3) goal kicks (19.7) off sides (5.9) injuries (2.8) goals (2.7) penalties (0.3) cards (4.4) and substitution (3.5) per match. Similarly Njororai (1996b) analysed the goals scored in the Africa cup of Nations Soccer Tournament 1957-1994. It was established that 260 matches had been played, with 259 lasting the regulation time while 1 (0.4%) was abandoned. Out of 259 matches, 181 (69%) were wins while 78 (30.1%) were tied by the 90 minutes regulation time. A further analysis showed that on average 60.2% of the teams winning were also leading at half time, 33.1% were tying 3.9% tracking and 2.8% could not be determined. Further more 84.5% of the teams that scored first won the game while 12.7% and 2.8% came from behind to win and could not be determined respectively. Most goals are scored during the first and last third of each half of the game. On average, 2.5 goals were scored per match. It was observed that the scoring rate has decreased overtime, reflecting on improvement in the defense systems of African teams. It was concluded that given the significance of goals to the outcome of matches, spectators, players, coaches and sponsors, there is need to establish some of the patterns and trends pertaining to previous goal scoring to be able to improve on the process of getting them.

Analysis of goals scored in the USA'94 World Cup and that of the 1994 Africa Cup of Nations (Njororai 1995a, 1996a) also revealed that the right foot scores most goals and within the penalty area, more goals were also scored. In the second half of the matches, from the two studies, it was recommended that more scientific studies be done on the game of soccer so that the findings are incorporated in the improvement of the game. Additionally, analysis of the technical patterns can help to perfect skills during training and competition.

Luhtanen (1995) carried out a statistical evaluation of offensive actions in soccer at world cup level in Italy 1990. The purpose of the study was to explain a simple method to evaluate efficiency of the offensive actions in soccer at world cup level. Evaluation was done both using video recording and observing the real game including forty-seven matches. The variables observed include centres (crosses), shots, headers, free kicks, corners, throw-ins, penalties, goals and losses. Using One-way analysis of variance, in respect to the final place, Luhtanen (1995) showed significant differences in the number of shots, total amount of offensive actions, centres, and goals. However, no statistical significance was found in efficiencies. Regarding Argentina's performance, Luhtanen attributed their strength to high individual skills, strong defence, excellent goal- keeper, and free combination play. As for Germany, their strength lay in the highest frequency of attacks, lowest number of lost attacks, and highest number of shots at goal.

Additionally, Germany was most efficient, together with Cameroun, at creating scoring attempts. Thus, Luhtanen (1995) successfully used match analysis to evaluate performance of different teams.

Jinshan et. al. (1995) analysed the goals scored in the 14<sup>th</sup> world cup. The purpose of the study was to establish the scoring pattern so as to learn from the play of the highest level teams. The researchers recorded all the 52 matches of the 1990 world cup on video- tapes. An analysis was done on all the 115 goals from a tactical viewpoint. Some of the situations considered included crosses, dribbling, set plays, exploiting opponents' mistakes and the final pass. The results revealed that the inside-of-the -foot accounted for 24.4%; front, 18.3%; instep, 28.7%; outside, 1.7%; toe-kick, 0.8%; heading, 24.4% and sliding, 1.7%. Among the various shots, 8.7% of the total goals were volleyed. Jinshan et. al.'s (1995) study shows that it is possible to quantify technical and tactical performances in a soccer match.

Yamanaka et. al. (1995) analysed the playing patterns in the 1990 world cup. It was hypothesized that a developing soccer nation, in this case Cameroun, exhibited some of the patterns of one or more of the established playing styles in the mold of British Isles teams, European and South America styles. Twelve matches of each of the teams were selected to balance, as closely as possible, wins, losses, draws, goals for, goals against, qualifying round matches and knock- out matches. Four

matches of Cameroun were analysed using a computerized notation system and compared with data from the British Isles, European and South American teams.

A chi-square analysis of comparisons of Cameroun to the three groups showed that the playing style approached that of the South American teams more than the British teams. The Cameroun team had significant differences with most variables when compared with the British Isles teams, in particular the passing, ( $p < 0.001$ ), the use of the goal-keeper ( $p < 0.001$ ), running with the ball ( $p < 0.01$ ), shots ( $p < 0.01$ ), and headers ( $p < 0.001$ ). The passing patterns of the Cameroun team also varied significantly from those of the European and South American teams, ( $p < 0.01$ ), although they had more shots than those for the South Americans, they had less than the European ( $p < 0.01$ ). Generally, the Cameroun players dribbled less than both the European and South American teams, their running patterns were also different ( $p < 0.01$ ). It was concluded that although the playing style approached that of the South American teams, there were significant differences in styles to indicate that Cameroun developed their own playing pattern.

Similarly, Partridge et. al. (1995) compared the technical performance of the 1990 world cup and intercollegiate soccer. The researchers concluded that although some results indicated differences in playing styles between the two levels of soccer performance (passing and possession loss), others showed similarities in important components of team play e.g. number and execution of shooting

opportunities created. It was concluded that collegiate coaches needed to be selective when presenting the play of world cup teams as an appropriate model of performance for the play of their own team.

Partridge et. al. (1995) and Yamanaka et. al. (1995) illustrates the viability and importance of carrying out an analysis of soccer matches at different levels. Findings derived from such observations are vital in molding an upcoming team's style of play. The reviewed studies reveal the attempts made to analyse soccer matches. Useful findings and inferences were made from these studies. However, technical variables analysed are limited as most authors restricted themselves to one or a few aspects of the game. Therefore, this study was designed to widen the scope of variables under consideration as well as the comparison of performance of the top playing nations (Argentina and Germany), and one developing nation, Kenya.

### **2.3.1 SUMMARY**

This chapter reviewed literature related to the question of performance analysis and especially matches analysis in soccer. A review of literature on match analysis reveals that there is need to constantly carry out match observations and come up with innovative ways of gathering data from matches so as to facilitate effective coaching in technical and tactical aspects of the game. A cursory look at the teams of Germany and Argentina also reveal the fact that their success has been due to

sound technical and tactical ability both at the individual and the team levels. Whereas the teams of Germany and Argentina have excelled at international levels, that of Kenya has not. According to Luhtanen (1995) and Yamanaka et. al. (1995), comparative match analysis of teams from different regions, levels and tactical orientation is helpful in deriving lessons that can be incorporated in a team's training and preparation for competitions. Additionally, Dufour (1995) and Partridge et.al. (1995) emphasized the need to carry out comparative studies on different levels of teams so as to derive the best modes of play that can be transferred to the weaker ones. Weaker or upcoming teams tend to model themselves along the established teams. Hence there was need for a study to be undertaken on Kenya's performance vis-à-vis that of Argentina and Germany so as to appreciate the similarities, differences and to remedy the weaknesses.

The analysis could be of great help in promoting soccer in Kenya and will also provide an avenue of understanding the Latin America Football, where countries, other than Argentina have also been highly rated in world tournaments (Docherty, 1978). This study, therefore, focused on identifying the differences in the technical and tactical performance of the national teams of Kenya, Germany and Argentina using competitive international matches. It also aimed at identifying the variables that characterise winning teams as well as establishing the level of accuracy of each of the soccer variables in a match. Chapter three addresses the methodology used in the study.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1.0 INTRODUCTION**

This chapter covers the methodology that was used in the study. The areas specifically include the target population, the sampling method, the observation schedule, procedure and the data analysis techniques.

#### **3.2.0 TARGET POPULATION**

The matches for analysis were drawn from those played by the national teams of Germany, Argentina and Kenya at international competitive levels. The matches for Germany were sampled from those played in the 1988 and 1992 European Cup Championships, the qualifying round for and the 1990 as well as the 1994 World Cup tournaments. A total of 21 unedited pre-recorded German matches available on videotape were used for sampling purposes. Argentina's matches were drawn from those played in the 1990 and 1994 World Cup tournaments as well as the South American Continental Championships (COPA America). A total of 15 matches on videotape provided the population of study for the Argentine team. Those for Kenya were 11 and were drawn from the qualifying round for the 1990 and the preliminary one for the 1998 World Cup, the 1990 and 1992 Africa Cup of Nations' qualifying and final tournaments, and the 1994 East and Central Africa Senior

Challenge Cup. A total of 47 matches provided the population of the study. These were matches that were accessible on videotape.

### **3.3.0 SAMPLING METHOD**

The matches for this study were sampled, on a stratified basis, from the international matches played by each of the countries of Argentina, Germany and Kenya to allow for the analysis of matches won, drawn and lost. A total of nine matches for each team were randomly selected from matches played between 1988 and 1996 to analyze the performance. Of the nine matches, three were matches won, three lost and three drawn respectively. All the three countries had played numerous World Cups and Continental qualifying matches in the period in question. For Argentina, 9 matches were drawn from 15 that were available on unedited pre-recorded videotapes. The sample for the German national team was drawn from 21 matches, while for Kenya, 11 such matches were available. The national teams of Argentina and Germany were purposely chosen because the former were the 1986 World Cup Champions and runners-up in the 1990 edition, while the latter were runners-up in 1986 and Champions in 1990. Kenya, on the other hand, is a country that has not made a strong impact at both Continental and World Cup levels yet the game of soccer is one of the most popular sports in the country. A total of twenty-seven (27) matches were analysed in the study.

### 3.3.0 THE RESEARCH INSTRUMENT

A soccer match analysis chart was used as the instrument to guide the match observation and recordings (See Appendix A). This instrument was developed out of that by Byshovets et. al. (1995), Dufour (1995), Gerisch & Reichelt (1995), Jinshan et. al. (1995), Luhtanen (1995), and Partridge et. al. (1995). The instruments have been used in the analysis of technical and tactical variables in soccer at international tournaments. The technical and tactical variables analysed were all drawn from the game of soccer.

The instrument used in the study takes care of the recording of observations for two teams playing in a match. For every technique exhibited, a tally is made as to whether it was successful or unsuccessful. The researchers carried out a pilot study on video play back and live matches where two research assistants, with previous match analysis experience were used to test the Instrument. Repeated observations revealed an intra observer consistency of .95, while that of the inter-observer reliability was .96 on high occurrence technical variables. Any variation on the latter was resolved by taking the average. However, any variation beyond four (4) digits was resolved by re-watching the match. Additionally, the researchers perfected their observation and notation skills by watching and recording live soccer matches on Television and local stadium. These constant practices ensured a high inter observer consistency as well as intra observer reliability.

### **3.4.0 PROCEDURE FOR DATA COLLECTION**

Pre-recorded matches of the national teams of Germany, Argentina and Kenya were played back on a video machine and observed. The observation of these matches specifically focused on the following quantifiable variables: throw-ins, goal attempts, corners, crosses, headings, free kicks, goal kicks, passes, penalties, preferred side of attack and goals scored. These technical variables were recorded depending on whether they were successful or unsuccessful. The successful variable is the one that reached the intended target. On the other hand, a variable was considered unsuccessful if the player attempting to make a pass or shot or tackle missed out, committed a foul for which his team was penalized, or was intercepted by an opponent. Technical executions that led to loss of possession to opponents were therefore tallied as unsuccessful. The other variables such as off side, injury, cards, substitutions and fouls were recorded in terms of number. A tally was made on the chart the moment such an occurrence took place.

### **3.5.0 DATA ANALYSIS TECHNIQUES**

Various techniques were used in analysing and presenting the data in the study. These included both descriptive and inferential statistical methods. The latter included use of the  $\chi^2$ -test and one way analysis of variance. Both the t test and one way analysis of variance are useful in testing differences among groups. The t and F ratios were used to determine if groups were significantly different from one

another. To analyze the descriptive data, percentages, frequencies, the mean, standard deviation, minimum and maximum values were computed and presented.

### **t Test**

A t test tests whether or not the difference between two sample means is significant (Nie et. al, 1975). The t test was used to compare the over all means of variables of the winners and losers. The variables considered include passes, goals, off-sides, corners, throw- ins, goal attempts, crosses, headings, free kicks, tackles, fouls and offensive play. The t test was therefore used to determine whether winners performed significantly different from the losers on the listed technical and tactical variables. Additionally, the t test was used to establish existence of a significant difference in the successful and unsuccessful performance of winning and losing teams in matches involving the national teams of Kenya, Germany and Argentina.

### **One Way Analysis of Variance**

The one-way analysis of variance was used to test the variations in the performance of passes, goals, off sides, corners, throw ins, goal attempts, crosses, heading, free kicks, goal kicks, tackles, attack, fouls and injuries in matches involving the national teams of Argentina, Germany and Kenya. Analysis of variance was also used to test the difference in the successful and unsuccessful technical executions of throw-ins, goal attempts, free kicks, headers, crosses, goal

kicks, corner kicks, penalties and passes in matches involving Germany, Argentina and Kenya. The analysis of variance was suitable for determining differences among two or more groups (Borg & Gall, 1983; Thomas & Nelson, 1990). A post hoc comparison, Newman-keuls test was used in case of a significant F ratio.

The purpose of the study was to:

- I. To identify the differences in the technical and tactical performance of the national teams of Germany, Argentina and Kenya during competitive international matches.
- II. To identify the variables that the national winning and losing teams of Germany, Argentina and Kenya.
- III. To establish the level of accuracy of each of the technical and tactical variables in a match.

To guide the attainment of the above objectives, hypotheses were formulated and tested by use of ANOVA and a t-test. The acceptance and rejection of hypotheses was set at 5% (0.05). A significance level of 0.05 was used in the discussion.

## 4.2.0 MATCH ANALYSIS FINDINGS

This section deals with the performance of technical variables for and against the national player teams of Germany, Argentina and Kenya, winning and losing team, successful and unsuccessful technical executions and the effective

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1.0 INTRODUCTION

The purpose of the study was threefold:

- I To identify the differences in the technical and tactical performance of the national teams of Germany, Argentina and Kenya using competitive international matches.
- II To identify the variables that characterise winning and losing teams of Germany, Argentina and Kenya.
- III To establish the level of accuracy of each of the technical and tactical variables in a match.

To guide the attainment of the above objectives, hypotheses were formulated and tested by use of ANOVA and a t test. The acceptance and rejection of hypotheses was set at  $P < .05$ . Additionally, the findings are interpreted and discussed.

#### 4.2.0 MATCH ANALYSIS FINDINGS

This section deals with the performance of technical variables for and against the national soccer teams of Germany, Argentina and Kenya; winning and losing teams; successful and unsuccessful technical executions and the effective

execution of the various technical and tactical variables in the matches involving Germany, Argentina and Kenya.

#### 4.2.1 TECHNICAL VARIABLES FOR AND AGAINST GERMANY, ARGENTINA AND KENYA

It was hypothesized that there was no significant difference in the performance of the national teams of Germany, Argentina and Kenya on the following technical and tactical variables: -

##### (i) Passes

**Table 1: Differences in the passes for the national teams of Germany, Argentina and Kenya.**

Team	Passes	Number	%	Total	%
Germany	For	3839	53	7238	32.9
	Against	3399	47		
Argentina	For	3872	51.2	7558	34.3
	Against	3686	48.8		
Kenya	For	3420	47.4	7209	32.8
	Against	3789	52.6		
TOTAL		22005		22005	100

#### ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	8334.8	2	4167.4	0.5
Within	207041	24	8626.7	
Total	215376	26		

$F(2,24) = 0.5$   $P < .05$  i.e.  $F$  with 2 and 24 degrees of freedom equals 0.5 and is not significant at less than the 0.05 level.

\*Critical Value (2, 24) = 3.40

Table 1 shows that the national team of Germany had more passes (53%) compared to those made by the opponents (47%). The Argentine team also had more passes (51.2%), compared to the opponents (48.2%). However, the national team of Kenya had less passes (47.4%) compared to her opponents (52.6%). Cumulatively, however, there was no significant difference in the passes executed in the matches involving the national teams of Germany, Argentina and Kenya.

The proportion of passes for and against reflects the changing nature of the game throughout the period of play. Possession is won and lost at short intervals. Given the significance of a pass in a match, it is vital that its execution is perfected. According to Partridge et. al. (1995), the world cup teams successfully completed significantly more passes in a game than teams at college level. The author attributed the difference to poor technical execution of passes by the collegiate teams. According to Dufour (1995), 65% of winning teams are those that enjoy more ball possession. A team that enjoys better possession is the one that has mastered the passing technique. Sixty two percent of winning teams play longer with the ball than do the losing ones. Although there was no significant difference in the average number of passes exchanged during matches by the national teams of Germany, Argentina and Kenya, the latter had less compared to her opponents (47.4%).

## II. Goals

**Table 2: Differences in the goals for the National Teams of Germany, Argentina and Kenya.**

Team	Goals	Number	%	Total	%
Germany	For	10	45.5	22	39.3
	Against	12	54.5		
Argentina	For	12	54.5	22	39.3
	Against	10	45.5		
Kenya	For	05	41.7	12	21.4
	Against	07	58.3		
Total		56	100	56	100

### ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	7.5	2	38	2.00
Within	44.4	24	1.9	
Total	51.9	26		

\*F (2,24)=2.0 i.e. F with 2 and 24 degrees of freedom equals 2.0 and is not significant at less than 0.05 level.

Table 2 shows the difference in the goals scored and conceded by national teams of Germany, Argentina and Kenya. The German team scored 10 (45.5%) and conceded 12 (54.5%). The Argentine team scored twelve (54.5%) and conceded 10 (45.5%). The Kenyan team scored five (41.7%) and conceded seven (58.3%). Matches involving the Kenyan team had the least proportion of goals scored and conceded (21.4%), compared to 39.3% and 39.3% for Germany's and Argentina's matches respectively. However, the difference in the goals scored was

not statistically significant.

Despite the absence of statistical significance, it is vital to emphasize that the scoring average of 2.4 goals per match involving both the German and Argentine teams and 1.3 for the Kenyan matches is on the lower side. The scoring rate is low compared to 2.71 and 2.21 that were registered in the 1994 World Cup and the 1994 Africa Cup of Nations respectively. A low tally of goals has previously been attributed to the low effectiveness or accuracy level in the execution of offensive situations such as the corners, crosses, goal attempts and free kicks as well as the over-emphasis on defensive organization, low technical ability of the strikers and lack of coordinated play in the penalty area (FIFA, 1994; Jinshan et. al, 1995; Njororai, 1995. a, 1996 a, d; UEFA, 1996b).

### 111. Offside

**Table 3: Differences in the offside for the National Teams of Germany, Argentina and Kenya.**

Team	Off-sides	Number	%	Total	%
Germany	For	31	52.5	59	28.8
	Against	28	47.5		
Argentina	For	22	33.3	66	31.7
	Against	44	66.7		
Kenya	For	44	53	83	39.9
	Against	39	47		
TOTAL		208	100	208	100

## ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	33.8	2	16.9	1.6
Within	257.8	24	10.7	
Total	291.6	26		

\*F (2,24)=1.6 i.e. F with 2 and 24 degrees of freedom is equal to 1.6 and not significant at 0.05 level.

Table 3 shows the difference in the off- sides during the matches for the national teams of Germany, Argentina and Kenya. The national team of Germany had a total of 31 off- sides (52.5%) while the opponents had 28 (47.5%). The Argentine team had 22 (33.3%) while the opponents had 44 (66.7%). The Kenyan team had 44 (53%) and her opponents 39 (47%).

The matches involving the German team had the lowest proportion of the offside (28%) compared to those for Argentina (31.7%) and Kenya (39.9%). The matches involving the Kenya team had the highest number of offsides.

However, there was no significant difference in the performance of the national teams of Germany, Argentina and Kenya on the offsides. The evidence was not enough to reject the null hypothesis.

The off- side is a tactical tool that is used especially by defending teams.

Although some authors argue that the offside is a form of negative play, it is still

evident that teams use it in their defensive organization (Docherty, 1978; Wade, 1970; Winterbottom, 1964). However, it requires perfecting if potentially embarrassing situations are to be avoided such as Nigeria's winning goal at the Atlanta Olympic games against Argentina (Nepfer, 1996), or the winning one for Germany against the Czech Republic in the Euro'96 final (UEFA, 1996). These observations concur with Dufour's (1995) analysis of the off-sides during the 1984 European Nations Cup tournament. The Tournament had 313 offside actions averaging 22.5 per match. However, only 55% of them were correctly executed. Of those the referee correctly estimated only 29%, whereas 26% were unjustly whistled. But 9% of incorrect off side movements were nevertheless granted. According to him, only 38% of the off side traps prove effective as the judgement of the referee also plays a huge part. Van Meerbeek et. al. in Dufour (1995) reported that the best referees at the 1986 world cup finals whistled about 17.4% wrong decisions.

Given the erratic nature of the execution and the refereeing aspect of the offside, the tactic requires proper training and defensive organization if a team has to effectively apply it.

iv **Corner Kick**

The results for the corner are shown in Table four.

**Table 4: Differences in the corner kicks for the national teams of Germany, Argentina and Kenya.**

Team	Corner	Number	%	Total	%
Germany	For	60	61.2	98	41.5
	Against	38	38.8		
Argentina	For	31	47.0	66	28.0
	Against	35	53.0		
Kenya	For	30	41.7	72	30.5
	Against	42	58.3		
TOTAL		236	100	236	100

**ANOVA Summary Table**

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	64.3	2	32.15	3.42*
Within	224.9	24	9.4	
Total	289.2	26		

\*F (2,24)= 3.42 i.e. F with 2 and 24 degrees of freedom equals 3.42 and is significant at less than 0.05 level.

Table four shows that the German team had the highest proportion of corner kicks (61.2%) compared to her opponents (38.8%). The Argentine team had 47% compared to 53% for the opponents. The national team of Kenya had 41.7%

compared to 58.3% for the opponents. In total, the matches involving the German team had a proportion of 41.5%, Argentina 28% and Kenya 30.5%. Matches involving Germany were characterised by more corner kicks, compared to those of Argentina and Kenya. The null hypothesis that there was no significant difference in the performance of the corner kicks in matches involving the national team of Germany, Argentina and Kenya was therefore rejected. However, when the data was subjected to a Newman - keuls test, the difference was not that significant. This implies that that frequency of occurrence of the corner kicks in different matches is fairly similar, although some may have slightly more such as those of Germany.

The corner kick is one of the major offensive technical and tactical variables in a soccer match. At the 1994 world cup in the USA, seven goals were scored from corner kicks out of a total of 141 goals. At Euro '96, seven goals resulted from corner kicks from a total tally of sixty-four representing about 11% of all the goals (UEFA, 1996).

A team that earns a corner kick therefore gets an opportunity to attack the opponents' goal directly. In this context, the German team enjoyed more opportunities to attack from the corner kick compared to Kenya and Argentina.

## V Throw in

The results for the performance of the throw in by the national teams of Germany, Argentina and Kenya are shown in table 5.

**Table 5: Differences in the throw-ins for the national teams of Germany, Argentina and Kenya.**

Team	Throw ins	Number	%	Total	%
Germany	For	146	46.9	311	25.8
	Against	165	53.1		
Argentina	For	148	49.3	300	24.9
	Against	152	50.7		
Kenya	For	330	55.6	594	49.3
	Against	264	44.4		
TOTAL		1205	100	1205	100

### ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	6171.3	2	3085.7	21.7*
Within	3421.0	24	142.5	
Total	9592.3	26		

\*F (2,24)=21.7 i.e. F with 2 and 24 degrees of freedom equals 21.7 and is significant at less than 0.05 level.

Table 5 shows that the matches involving Kenya were characterised by a high rate of throw ins. The Kenyan team had 330 (55.6%) such situations compared to her opponents. Germany had a proportion of 46.9% compared to her opponents (53.1%), while Argentina had 49.3% compared to her opponents (50.7%). Thus both Germany and Argentina had less throw ins compared to their opponents while Kenya had more. The differences in the frequency of the throw ins was statistically significant. The hypothesis that there was no significant difference in the performance of the throw ins in matches involving the national teams of Germany, Argentina and Kenya was therefore rejected. A post hoc comparison using the New man- keuls test showed a significant difference in the performance of the throw- in between Kenyan matches and those of German and Argentina respectively. However, no significant difference was established when throw-ins in German and Argentinean matches were compared. This implies that Kenyan matches had significantly more throw-inns than matches for either Germany or Argentina did.

Table 5: Differences in the total throw-ins in matches involving Kenya, Germany and Argentina

A throw in represents a set piece situation where a team gains possession at the expense of the opponent. There were a total of 1205 throw ins averaging 44.6 per single match. The team that takes the throw in is the one that is afforded an offensive opportunity whereas the opponents reflect a defensive stance. The frequency of the throw- ins in the study is comparable to the 42 per match established in the 1994 world cup soccer tournament (Njororai, 1996 b). Despite

the high number of throw-ins, only a limited number directly or indirectly lead to goals. In the 1996 Atlanta Olympic football tournament for men, the throw ins led to 2 (7.1%) out of the 90 goals scored (FIFA, 1996). However, in the 1993 world youth championships, four (15.4%) of the goals resulted from a throw in (FIFA, 1995). A throw in therefore can be improved to positively contribute to the offensive strategy of a team. It also serves as a vital defensive strategy as taking the ball out allows the defending team room to re-organize their defensive strategy. But when the ball is taken out too much, it interferes with the flow of the game. Thus the high number of throw ins matches involving the Kenyan team may reflect the lack of continuity in ball possession and erratic clearance of the ball in their defensive play.

vi **Goal Attempts:**

The results for the attempts at goal are shown in table 6.

**Table 6: Difference in the goal attempts for the national teams of Germany, Argentina and Kenya.**

Team	Goal attempts	Number	%	Total
Germany	For	85	46.7	182 (31.4%)
	Against	97	53.3	
Argentina	For	82	42.1	195 (33.6%)
	Against	113	57.9	
Kenya	For	78	38.4	203 (35.6%)
	Against	125	61.6	
TOTAL		571	100	580

### ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	24.9	2	12.45	0.5
Within	649.8	24	27.1	
Total	674.7	26		

$F(2,24)=0.5$  i.e. F with 2 and 24 degrees of freedom equals 0.5 and is not significant at less than 0.05 level.

Table 6 shows that the national teams of Germany, Argentina and Kenya had fewer attempts at goal compared to their opponents. Germany had 46.7%, Argentina 42.1% and Kenya 38.4% of the attempts at goal compared to 53.3%, 57.9% and 61.6% of their opponents respectively. Cumulatively, the matches involving Kenya had a higher proportion of the goal attempts (35%), while those involving Germany and Argentina had 18.2% and 19.5% respectively. On average, there were 22.5 shots aimed at the goal per match. When the attempts at goal are compared across the matches involving Germany, Argentina and Kenya, the difference is not statistically significant. The hypothesis that there was no significant difference in the performance of the attempts at goal in matches involving the national teams of Germany, Argentina and Kenya was therefore not rejected.

Any offensive play of a team is geared towards a shot with the hope of scoring a goal. During the 1994 world cup soccer tournament, there were on average, 20

shots directed at goal per match (Njororai, 1996 b). The present finding of 22 such shots compares well with that for the 1994 world cup soccer tournament. According to Yamanaka et al (1995), Cameroun managed to advance to the quarterfinals of the 1990 edition of the world cup soccer tournament because of their inclination to shoot at goal. The Cameroun players managed to have significantly more shots than the team from the British Isles and South America. This finding is in agreement with that of Luhtanen (1995) who established that African teams had, on average, a higher rate of attempting at goal. On their part, Partridge, et al (1995) established that the shot to goal ratio was 11.9:1 and 11.5:1 for college and world cup teams respectively. In the current study, though there was no significant difference in the attempted shots at goal, matches involving Kenya had slightly more than for those of Germany and Argentina. However, at team level, German players shot more (85) compared to 82 and 78 for the Argentine and Kenyan players.

## Vii Crosses

Table seven shows the results of the crosses.

**Table 7: Differences in the crosses for the national teams of Germany, Argentina and Kenya.**

Team	Crosses	Number	%	Total
Germany	For	158	55.2	286 (32.9%)
	Against	128	44.8	
Argentina	For	127	44.0	287 (33%)
	Against	160	56.0	
Kenya	For	133	44.8	297 (34.1%)
	Against	164	55.2	
Total		870	100	870

## ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	8.2	2	4.1	0.06
Within	1764.5	24	73.5	
Total	1772.7	26		

\*F (2,24)=0.06 i.e. F with 2 and 24 degrees of freedom equals 0.06 and is not significant at less than 0.05 level.

Table 7 shows that Germany had a higher proportion of the crosses (55.2%) than her opponents did. Each of the teams of Argentina and Kenya had less, 44.0% and 44.8%, of the crosses compared to the opponents. Cumulatively, there were 870 crosses, averaging about 32 per match. In terms of over-all proportions, the matches involving Germany had 32.9%, Argentina 33% and Kenya 34.1%. Thus, there were slightly more crosses in the matches involving Kenya than the two other teams. However, the evidence was not enough to reject the hypothesis that there was no significant difference in the performance of the crosses in the matches involving Germany, Argentina and Kenya.

A cross is a vital component in the offensive strategy of a team. On the defensive side, it is a tactical plan that is very challenging to counteract. The finding that there were, on average, 32 crosses per match compared favourably with the 30.6 established by Njororai (1996b) during the 1994 world cup soccer

tournament. Additionally, Partridge, et. al. (1995) found no difference in the crossing of balls between collegiate and world cup teams. The game of soccer seems to have underlying consistencies irrespective of the level of play.

According to Jinshan et. al. (1995) each of the 1990 world cup teams paid special attention to the width of its attack to break the opposition's defence line.

Thus in the 1990 world cup tournament, 32 goals resulted from an attack down the wing (27.8%), most of which were completed by a cross.

### Viii Heading

Table 8 presents the results pertaining to heading.

**Table 8: Differences in the headings for the national teams of Germany, Argentina and Kenya.**

Team	Headings	Number	%	Total
Germany	For	328	49.6	661 (34.7%)
	Against	333	50.4	
Argentina	For	230	51.6	446 (23.4%)
	Against	216	48.4	
Kenya	For	417	52.3	797 (41.9%)
	Against	380	47.7	
TOTAL		1904	100	1904

### ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	6960.1	2	3480	8.7*
Within	9650.6	24	402.1	
Total	16610.7	26		

\*F (2,24)=8.7 i.e. F with 2 and 24 degrees of freedom equals 8.7 and is significant

at less than 0.05 level.

The table shows that Germany had less headings of the ball (49.6%) compared to her opponents. Argentina (51.0%) and Kenya (52.3%) had more than their respective opponents did. However, the Kenyan team had more situations (417) of heading the ball compared to those of Germany (328) and Argentina (230).

Comparatively, Argentina had the least headings, compared to Germany and Kenya. The headings in the matches involving the German, Argentine and Kenyan teams were different statistically. The null hypothesis that there was no significant difference in the heading of the ball in matches involving Germany, Argentina and Kenya was therefore rejected. Over all, a total of 1904 headings were recorded averaging about 71 per match respectively. A post hoc comparison using the New man- keuls test showed a significant difference in the performance of the headings between Kenyan matches and those of Germany. This implies that Kenyan and those involving Germany had significantly more heading of the ball situations than matches for Argentina did.

Heading of the ball is a frequent technical and tactical device in a soccer match. In the 1994 world cup soccer tournament, an average of 73.8 episodes of heading were noted (Njororai, 1996b). The high number of headings by the Kenyan team reflects its defensive oriented strategy as well as over all style of play. It seems that Kenya inherited the British style of play where heading is a significant factor (Yamanaka et. al. 1995).

## IX Free Kicks

The results of the free kick are presented in table 9.

**Table 9: Differences in the free kicks for the national teams of Germany, Argentina and Kenya.**

Team	Free kicks	Number	%	Total
Germany	For	186	52.5	354 (34.4%)
	Against	168	47.5	
Argentina	For	199	51.0	390 (38%)
	Against	191	49.0	
Kenya	For	118	41.5	284 (27.6%)
	Against	166	58.5	
TOTAL		1028	100	1028

### ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	645.7	2	322.9	6.97*
Within	1110.2	24	46.3	
Total	1755.9	26		

\*F (2,24)=6.97 i.e. F with 2 and 24 degrees of freedom equals 6.97 and is significant at less than 0.05 level.

Table 9 shows that the national soccer team of Germany had more free kicks (52.5%) compared to her opponents (47.5%). The Argentine team also had more (51%) than her opponents (49%) while Kenya had less (41.5%). At the team level, Germany had 186 free kicks, Argentina 199 and Kenya 118. Kenya therefore had the lowest. Over all, the matches involving Argentina had the highest proportion of free kicks (38%), followed by those of Germany (34.4%) and lastly those of Kenya (27.6%). The total free kicks observed were 1028 averaging 38 per match. The over-all difference in the free kicks in the matches

involving Germany, Argentina and Kenya was significant statistically. The null hypothesis that there was no significant difference in the execution of free kicks in the matches involving Germany, Argentina and Kenya was therefore rejected.

A post hoc comparison using the Newman-keuls test showed a significant difference in the performance of free kicks between Argentina and Kenya as well as between the latter and Germany. However, no significant difference was established between German and Argentinean matches. There were significantly more free kicks in matches involving both Argentina and Germany than those involving Kenya.

A free kick provides a team with an opportunity to either launch an attack or to strike straight at goal. In terms of frequency, the number of free kicks observed in this study, on average per match, are higher than the 30 noted in the 1994 world cup tournament (Njororai, 1996b). The significance of the free kicks is illustrated by previous statistics which show that 5 (17.9%) of the 90 goals scored in the Atlanta Olympic games emanated from free kicks (FIFA, 1996) while four out of 64 resulted during the Euro '96 tournament (UEFA, 1996). Even as the free kick is an offensive tactic, it also means that the defending team has to organise itself to counteract it. In the current study, Germany had to organise itself to counteract 333 free kicks, Argentina 216 and Kenya 380. This goes to show that it is important for coaches to prepare both offensive and defensive strategies pertaining to free kick situations.

## X Goal kicks

The results for the goal kick are presented in table 10.

**Table 10: Differences in the goal kicks for the national teams of Germany, Argentina and Kenya.**

Team	Goal kicks	Number	%	Total
Germany	For	73	51	143 (25.7%)
	Against	70	49	
Argentina	For	89	52	171 (30.8%)
	Against	82	48	
Kenya	For	150	62	242 (43.5%)
	Against	92	38	
TOTAL		556	100	556

### ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	578.7	2	289.4	8.6*
Within	809.8	24	33.7	
Total	1388.5	26		

\*F (2,24)= 8.6 i.e. F with 2 and 24 degrees of freedom equals 8.6 and is significant at less than 0.05 level.

Table 10 shows that the Germany team had more goal kicks (57%) than her opponents did. The Argentine and Kenyan teams also had more goal kicks, 52% and 62% respectively compared to their opponents. Kenya had a total of 150 goal kicks compared to 73 and 89 for Germany and Argentina respectively.

Cumulatively, the matches involving Kenya had 43.5%, Argentina 30.8% and those of Germany 25.7% of the goal kicks. The total goal kicks observed were 556, averaging 21 per match. The over all difference in the goal kicks in the

matches involving Germany, Argentina and Kenya was significant statistically. A post hoc comparison using the Newman-keuls test showed a significant difference in the performance of goal kicks in matches involving Kenya and those of both Argentina and Germany respectively. No difference was established between matches for Germany and Argentina. Thus matches involving Kenya were characterised by a high rate of goal kicks compared to those for Germany and Argentina.

The null hypothesis stating that there was no significant difference in the execution of the goal kick in matches involving the national soccer teams of Germany, Argentina and Kenya was therefore rejected. A goal kick provides a team with an opportunity of regaining possession from the opponent. The average of 21 per match tallies with the 20 recorded in the 1994 world cup soccer tournament (Njororai, 1996b). The frequency of goal kicks in a match however reflects the styles of the participating teams. According to Yamanaka, et. al. (1995), the British Isles teams tend to have a high number of goal kicks given that they prefer using them as a means of transporting the ball downfield into the opponent's half of the field. It appears that Kenya falls in the mold of the British style of play. It is also significant to note that the more goal kicks a team has reflects their defensive orientation vis-à-vis the opponents. In this case Kenya was more often on the receiving end thus the need to put the ball

back into play via a goal kick. The Argentine and the German teams appear more balanced both in terms of the goal kicks for and against.

## XI Tackles

The results of the tackle are presented in Table 11.

**Table 11: Differences in the tackles for the national teams of Germany, Argentina and Kenya.**

Team	Tackles	Number	%	Total
Germany	For	446	48.8	914 (34.3%)
	Against	468	51.2	
Argentina	For	445	47.5	935 (35.1%)
	Against	490	52.5	
Kenya	For	442	54.1	817 (30.6%)
	Against	375	45.9	
TOTAL		2666	100	2666

## ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	880.5	2	440.25	2
Within	5348.7	24	222.9	
Total	6229.2	26		

\*F (2,24)=2 i.e. F with 2 and 24 degrees of freedom equals 2 and is not significant at less than 0.05 level.

Table 11 shows that Germany had fewer tackles (48.8%) compared to her opponents. Argentina also had less (47.5%) while Kenya had more (54.1%) than the opponents. Cumulatively, there were 2666 tackles, averaging about 98 per match. In terms of over all proportions, the matches involving Germany had

34.3%, Argentina 35.1% and Kenya 30.6%. There were slightly more tackles in the matches involving Argentina than the two other teams. However, the evidence was not adequate to reject the hypothesis that there was no significant difference in the tackles executed in the matches involving Germany, Argentina and Kenya.

A tackle is vital in winning possession from the opponents without the necessity of stopping a match (Docherty, 1978). It is basically a defensive technique, though it eventually leads into an offensive move if successful. Thus, the aim of the tackler is not only to dispossess an opponent but also to be in control of the ball after coming out of the tackle (Docherty, 1978). It is apparent that the teams of Germany, Argentina and Kenya executed almost a similar number of tackles. However, compared to the opponents the Kenyans were more inclined to tackle, while the German and Argentina players tackled slightly fewer times than the opponents. This tallies with the ball possession as reflected by the passes. A team with more ball possession is bound to be tackled more by the opponent who aspires to regain possession. The Kenyan team had less possession hence tackled more to regain possession while Argentina and Germany had more possession thus the necessity of the opponents to engage in the tackles.

## Offensive Movements

Table 12 shows the results of the offensive movements. In this study the offensive movement refers to the number of times a team managed to take the ball into the opponents defensive third of the pitch.

**Table 12: Differences in the frequency of attacks for the national teams of Germany, Argentina and Kenya.**

Team	Offensive play	Number	%	Total
Germany	For	373	53.8	693 (33.0%)
	Against	320	46.2	
Argentina	For	336	49.1	685 (32.6%)
	Against	349	50.9	
Kenya	For	289	39.9	725 34.4
	Against	436	60.1	
TOTAL		2103		2103

### ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	99.6	2	49.8	0.33
Within	3635.1	24	151.5	
Total	3734.7	26		

\* $F(2,24)=0.33$  i.e. F with 2 and 24 degrees of freedom equals 0.33 and is not significant at less than 0.05 level.

Table 12 shows that the national team of Germany had more attacks (53.8%) compared to her opponents. Argentina (49.6%) and Kenya (39.9%) had less compared to opponents. Cumulatively, the matches involving Kenya had a higher proportion of the offensive movements (34.4%), while those involving Germany and Argentina had 33% and 32.6% respectively. On average, there were about 79 attacking movements in each match.

The object of the game of soccer is to score and to avoid conceding goals. For a team to score it has to advance the ball into the opponent's half of the field with the aim of finally scoring a goal. The frequency of attack by a team is geared towards achieving the objective of scoring a goal. However, not all attacks translate into goals. According to Dufour (1995) 90% of attacks end without a shot at goal. Of the remaining 10% only 1% enters the opposing goal because 45% are diverted, 45% pass sideways, 8 to 12 give a score. Luhtanen (1995) established that in terms of general offensive play during the 1990 world cup, Germany was the strongest team. They had the highest number of attacking trials, the lowest number of lost attacks and the highest number of scoring trials both with shots and headers. One key feature of the German team was that they played more in the middle and attacking third of the pitch compared to other teams. They did this by playing wide and deep passes well, overlapping, had long runs by the defenders, scissors and combinations of wall passes and double wall posses (Luhtanen, 1995). In the current study, though Germany had more attacks (373) compared to Argentina (336) and Kenya (289), their efficiency (after taking into consideration the goals scored) was only 2.7%, which was less than that of Argentina (3.6%) and more than for Kenya (1.7%).

Defensively it also means that the Kenyan team was more on the receiving end of the opponent's constant attacks. Argentina also tended to defend slightly more than attack. In terms of balance in defence and attack, Argentina led followed by

Germany and Kenya. Generally, the effectiveness of the attacking movements is very low and requires to be constantly practiced if attack is to translate into more goals. Although there were slight differences in the attacking play between the German, Argentine and Kenyan team matches, it was not statistically significant. The null hypothesis that there was no significant difference in the attacking movements by teams in the matches involving Germany, Argentina and Kenya was not rejected.

### Xiii Fouls

The results for the fouls are presented in table thirteen.

**Table 13: Differences in the fouling rate for the national teams of Germany, Argentina and Kenya.**

Team	Fouls	Number	%	Total
Germany	For	159	48.2	330 (35. %)
	Against	171	51.8	
Argentina	For	156	44.7	349 (37%)
	Against	193	55.3	
Kenya	For	152	57.6	264 (28%)
	Against	112	42.5	
TOTAL		943	100	943

### ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	442.25	2	221.13	5.57*
Within	953.6	24	39.7	
Total	1395.85	26		

\*F (2,24)=5.57 i.e. with 2 and 24 degrees of freedom is equal to 5.57 and is significant at 0.05 level.

Table 13 shows that the national teams of Germany had fewer fouls (48.2%) than

her opponents. Argentina also did have fewer fouls (44.7%), while Kenya had more (57.6%) than the respective opponents. In terms of individual team fouls, Kenya had the lowest (152), behind Argentina (156) and Germany (159). Over all, the matches involving Argentina had the highest proportion of fouls (37%) followed by those of Germany (35%) and those of Kenya (28%). These results corroborate those of the free kicks. Most free kicks emanate from fouling hence the similarity of the patterns. The difference in the fouling rate between the matches involving Germany, Argentina and Kenya was statistically significant. The null hypothesis that there was no significant difference in the fouling rate in the matches involving the national soccer teams of Germany, Argentina and Kenya was therefore rejected. A post hoc comparison using the New man- keuls test showed significant differences in the fouling rates in matches involving Argentina and Kenya as well the latter and Germany. No significant difference was established in the fouling rate in matches involving Germany and Argentina. Thus matches involving Kenya had a significantly low fouling rate compared to those of Germany and Argentina. Fouling is an infringement of the rules of the game. However, some fouls are deliberately enacted to suit the tactical pattern of a team. The results reflect the combative nature of both the Argentina and German styles of play.

#### **Iv Injuries**

The distribution of injuries is shown in table 14 below. Table 14 shows that the national team of Germany had slightly more injuries (51.8%) compared to her opponents. Argentina and Kenya had 35.5% and 30.2% of the injuries when

compared to their respective opponents. The over-all results show that the matches involving Germany had a higher proportion of the injuries (40%) while those of Kenya and Argentina had 37.9% and 22.1% respectively. Argentine matches had minimal injuries compared to the others. However, the evidence was not enough to reject the hypothesis that there was a significant difference in the occurrence of injuries in matches involving the national soccer teams of Germany, Argentina and Kenya.

**Table 14: Differences in the injuries for the national teams of Germany, Argentina and Kenya.**

Team	Injuries	Number	%	Total
Germany	For	29	51.8	56 (40%)
	Against	27	48.2	
Argentina	For	11	35.5	31 (22.1%)
	Against	20	64.5	
Kenya	For	16	30.2	53 (37.9%)
	Against	37	69.8	
TOTAL		140		140

**ANOVA Summary Table**

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	41.4	2	20.7	2.33
Within	212.7	24	8.9	
Total	254.1	26		

\*F (2,24)=2.33 i.e. F with 2 and 24 degrees of freedom is equal to 2.33 and is not significant at 0.05 level.

## XV Cards

The distribution of the cards dished out by referees in matches involving the national teams of Germany, Argentina and Kenya was 30 (33%), 49 (53.8%) and 12 (13.2%) respectively. The matches involving Kenya had the lowest proportion of cautions and expulsions (13.2%), compared to those for Germany and Argentina. On average, there were 3.3 cautions per watch. The distribution of the cards shown to dissenting players showed a significant difference ( $F(2,24) = 7.8, P < .01$ ). The null hypothesis that there was no significant difference in the warning and sending off of players in matches involving Germany, Argentina and Kenya was therefore not rejected. A post hoc comparison using Newman-Keuls test showed a significant difference in the cautions administered in matches involving Argentina and Kenya. There were significantly more cautions in matches involving Argentina when compared to those of Kenya. However, no difference was established between matches involving Argentina and Germany and between the latter and Kenya. More than ever, yellow and red cards have become a phenomenon with seriously negative consequences (Michels, 1996). Cards are meant to be given only for truly dirty fouls or exceptional violations of the laws. Thus it is encouraging that the Kenyan players had a reasonably low caution rate.

### ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	76.1	2	38.1	7.8*
Within	118.2	24	4.9	
Total	194.3	26		

\*F (2,24)=7.8 i.e. with 2 and 24 degrees of freedom is equal to 7.8 and is significant at 0.05 level.

### XVI Substitutions

Substitution of players is a major component in the over-all strategic deployment of players in a match. In the matches involving the national teams of Germany, Argentina and Kenya the cumulative number of substitutions was 30 (34.1%), 30 (34.1%) and 28 (31.8%) respectively. The number of substitutions was basically the same hence the hypothesis that there was a significant difference in the substitution of players in matches involving the national teams of Germany, Argentina and Kenya was rejected.

### ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	0.3	2	0.15	0.33
Within	10.9	24	0.45	
Total	11.2	26		

\*F (2,24)=0.33 i.e. with 2 and 24 degrees of freedom is equal to 0.33 and is not significant at 0.05 level.

Substitution of players is vital in the modern game of soccer. According to Docherty (1978) the selection of the substitute should be calculated according to the circumstances of each match. Some of the key factors include the venue, the position, the score line, experience, injury, the tempo of the match, time, fatigue, tactical and strategic changes to the team. Thus the substitution of players should not just be an automatic decision without purpose. For effective substitution, coaches should make sure the technical bench has quality players. In Euro`96, a number of national coaches were quick to make changes when the situation required it (Uefa, 1996b). Substitute players have the advantage of being fresh, and knowledgeable about the general strategy and weakness of the opponents. In the 1995 world Youth Championship (FIFA, 1995) in Qatar, substitute players scored 11% of the total goals in the tournament.

#### 4.2.2 WINNING AND LOSING TEAMS

It was hypothesized that there was no significant difference in the performance of winning and losing national soccer teams of Germany, Argentina and Kenya on the following technical and tactical variables: -

- i. Passes
- ii. Goals

- iii. Off-sides
- iv. Corners
- v. Throw-ins
- vi. Goal attempts
- vii. Crosses
- viii. Headings
- ix. Free kicks
- x. Goal Kicks
- XI. Tackles
- xii. Offensive moves
- xiii. Fouls

The results for each of the above variables are presented below.

### I Passes

The results pertaining to the passes for the winning and losing teams are shown in Table 15.

**Table 15: Difference in passes made in won and lost matches by the national teams of Germany, Argentina and Kenya.**

Team	Pass	Won	%	Lost	%	Total	t-Value
Germany	For	1446	56.0	1135	44.0	2581	1.31
	Against	1141	50.1	1136	49.9	2277	0.05
	Sub-Total	2587	53.3	2271	46.7	4858	1.19
Argentina	For	1319	50.6	1287	49.4	2606	0.45
	Against	1348	53.2	1187	46.8	2535	0.23
	Sub-Total	2667	51.9	2474	48.1	5141	0.53

Kenya	For	1161	54.2	983	45.8	2144	2.76
	Against	1247	50.4	1245	49.96	2492	0.023
	Sub-Total	2408	51.9	2228	48.1	4636	1.14
	TOTAL	7662	52.4	6973	47.3	14635	1.49

Table 15 shows that the winning teams had slightly more passes (52.4%) than the losing teams (47.3%). The possession of the ball, as reflected by the passes exchanged, seems to have been higher for the winners. The winning teams of Germany, however, were more dominant as they had more passes (1446) compared to what the opponents had (1141) in the matches won by the former. On the other hand, both Argentina (1319) and Kenya (1161) had fewer passes compared to those exchanged by the losing opponents. However, at individual team levels, Germany had more passes in the matches that they won (56%) compared to the ones they lost (44%). This difference was not however statistically significant. Argentina and Kenya also had more passes in won matches (50.6% and 54.2%) respectively compared to those they had in the matches lost. The differences were also not statistically significant.

The fact that, on average the Argentine team had fewer passes for (1161) compared to those against (1247) in matches that she won reflects situations

where a team can enjoy more possession without necessarily winning the match. According to Dufour (1995), only about 62% of winning teams also enjoy better ball possession. Although a team enjoying better ball possession does not automatically win a match it does have a better chance. Passing is an important tactical device that should be emphasized in team training if a team is to stand a good chance of dominating and winning a match (Docherty, 1978; Muckle, 1981; Winterbottom, 1964).

## II Goals

The goals scored and conceded determines whether a team losses or wins a match. The results for the goals are shown in table 16.

**Table 16: Difference in goals scored in won and lost matches for the national teams of Germany, Argentina and Kenya.**

Team	Goal	Won	%	Lost	%	Total
Germany	For	05	71.4	02	28.6	07
	Against	02	22.2	07	87.8	09
	Sub-Total	07	43.8	09	56.2	16
Argentina	For	07	87.8	02	22.2	09
	Against	01	14.3	06	85.7	07
	Sub-Total	08	50.0	08	50.0	16
Kenya	For	05	100	00	00	05
	Against	01	14.3	06	85.7	07
	Sub-Total	06	50	06	50	12
	TOTAL	21	47.7	23	52.3	44

Table 16 shows that Germany scored five goals in all the matches that they won, but just conceded two. In those that they lost they scored only two and conceded seven goals. For Argentina, they scored seven and conceded one in

matches that they won, while in those they lost they managed to score only two and conceded six. Kenya, on her part scored five goals and conceded only one in the matches won. However, she did not score at all in the matches she lost, while conceding six goals.

Teams aim to score as many goals as possible so as to stand a better chance of winning not only a match, but also a championship (Docherty, 1978; Edwards and Campbell, 1981; Kerubo, 1996; Njororai 1996b). Teams that are efficient at scoring goals tend to dominate in tournaments. For example, Germany was the most efficient at scoring in the 1990 world cup and they became the champions of the tournament (Yamanaka et. al. 1995). In other tournaments such as the Barcelona '92 Olympic Games and the 1996 Africa Cup of nations Soccer Competitions, winning teams also enjoyed a high scoring record while conceding the least (El. Wahsh, 1996; Nepfer, 1992).

### III Off-side

The results of the offside are shown in table 17.

**Table 17: Difference in the offsides in matches won and lost for the national teams of Germany, Argentina and Kenya.**

Team	Off-side	Won	%	Lost	%	Total	t-value
Germany	For	15	51.7	14	48.3	29	0.2
	Against	12	60	08	40	20	0.76
	Sub-Total	27	55.1	22	44.9	49	0.70
Argentina	For	06	54.5	05	45.5	11	0.47
	Against	12	40	18	60	30	1.75
	Sub-Total	18	43.9	23	56.1	41	0.67

Kenya	For	11	61.1	07	38.9	18	0.82
	Against	14	46.7	16	53.3	30	0.09
	Sub-Total	25	52.1	23	47.9	48	0.25
	TOTAL	70	50.7	68	49.3	138	0.13

Table 17 shows that Germany was penalized for off side more (15) than they conceded to the opponents (12) in won matches. The same trend was reflected in the lost matches where Germany was penalised 14 times while their opponents had eight. Argentina, on the other hand, were penalised less for off side in won (06) and lost (05) matches than their opponents respectively (12 and 18). As for Kenya, more off sides were registered against both in won (14) and lost (16) matches. Over all, the matches where Germany, Argentina and Kenya won had slightly more offsides (50.7%) than where they lost. However, the difference was not statistically different between winner and losers.

Whereas the penalizing of a team for offside may reflect some offensive attributes of a team, it also may be over done. Like wise a team that uses the offside trap defensively may force the opponents to be penalised frequently. Thus, the offside is a reflection of both the offensive nature of one team and the defensive strategy of the opponent. In this case, Germany was more offensively oriented while Kenya and Argentina, used the off side more defensively. However, the application of the off side tactic is a risky affair. A championship can depend on one decision from a referee, and it is vital that the; players know exactly where they stand on the interpretation of the rules. Both the defenders

who are using the off-side game and the attackers who are trying to overcome it, need clear guidance from the technical crew if a disastrous result is to be avoided (UEFA, 1996). According to Docherty (1978), a well drilled, alert defense can foil and frustrate attackers with smoothly operated off-side tactics but it can be a dangerous game to play if one or more of the defenders is giving anything less than 100 percent concentration. It is, therefore, imperative that coaches educate the players on the offside law so that they are able to apply it effectively as a tactical tool both defensively and offensively.

#### IV Corner

The results of the corner are presented in table 18.

**Table 18: Difference in the corners taken in won and lost matches by the national teams of Germany, Argentina and Kenya.**

Team	Corner	Won	%	Lost	%	Total	t-value
Germany	For	17	35.4	31	64.6	48	1.53
	Against	12	52.2	11	47.8	23	0.18
	Sub-Total	29	40.8	42	59.2	71	1
Argentina	For	09	39.1	12	60.9	21	0.67
	Against	12	57.1	09	42.9	21	0.88
	Sub-Total	21	50.0	21	50	42	0
Kenya	For	11	57.9	08	42.1	19	0.82
	Against	13	41.9	18	58.1	31	1.63
	Sub-Total	24	48	26	52	50	0.28
	TOTAL	74	44.8	89	55.2	163	1.11

Table 18 shows that Germany were awarded more corners in lost matches (64.6%) than won ones (35.4%). Argentina also had more corners in lost matches (60.9%) than in the ones that she won (39.1%). The losing opponents to both Germany and Argentina also had slightly more corners than the winning ones. As for Kenya, there were slightly more corners in the matches she won

compared to the lost ones. However, the losing and winning opponents had more corners. On average the winning teams of Germany, Argentina and Kenya had fewer corners than the same teams that lost. It seems losers had a higher tendency to attack and thereby win corners. However, the difference between the winners and the losers on their performance on the corner was not statistically significant.

However, it appears that all teams whether winning or losing have the corner situation to contend with both offensively and defensively. The corner is conceded when a member of the defending team takes the ball out of play over the goal line. Such situations arise when the attacking team piles pressure on the defenders. It is therefore not surprising that for Germany and Argentina the losing teams were awarded more corners. Trailing teams tend to adopt an all-attacking strategy in an effort to equalize. As for Kenya, the defensive situations of corners are more frequent reflecting the lack of dominance on the exchanges in the game. The corner kicks though frequent in matches do not lead to as many goals as one would expect (UEFA, 1996). For example only 5% of the total goal's (87) scored in the Barcelona '92 Olympic Soccer Tournament and 7% in the Atlanta '96 Games (90) emanated from corner kicks respectively (FIFA, 1996; Nepfer, 1992). The execution of the corner kick in matches requires to be improved. Coaches and players should therefore spend more time and effort in perfecting the delivery of the corner kick during practice sessions.

But as a team practices on how to convert corner kicks into goals, a coach should not ignore the defensive responsibility of protecting the goal. An effective team is one that converts a high proportion of their corner kicks into goals and fouls the attempt by opponents to score them from a corner situation.

## V Throw- ins

Table 19 shows the results pertaining to the throw-in.

**Table 19: Difference in the throw-ins taken in won and lost matched for the national teams of Germany, Argentina and Kenya.**

Team	Throw in	Won	%	Lost	%	Total	t-value
Germany	For	39	42.9	52	57.1	91	0.68
	Against	61	58.1	44	41.9	105	0.85
	Sub-Total	100	51	96	49	196	0.16
Argentina	For	46	41.4	65	58.6	111	1.88
	Against	51	53.1	45	46.9	96	0.36
	Sub-Total	97	46.9	110	53.1	207	0.64
Kenya	For	135	62.5	81	37.5	216	2.3
	Against	103	57.9	75	42.1	178	2.74
	Sub-Total	238	60.4	156	39.6	394	2.98*
	TOTAL	435	54.6	362	45.4	797	1.14

\* Significant at 0.05 level,  $df=4$ , critical value 2.776.

Table 19 shows that Germany were awarded the throw-in more in the matches that she lost (57.1%) than those won (42.9%). The opponents also had more throw ins in lost matches (58.1%) than won ones (41.9%). The same trend is reflected in the matches involving Argentina. The lost matches both for Argentina (58.6%) and the opponents (53.1%) had more throw ins than when victory was registered. However, the matches involving Kenya had more throw ins for Kenya compared to the opponents irrespective of the result. On over-all

average, the matches where Germany, Argentina and Kenya won had more throw-ins (54.6%) than where they lost (45.4%). However, the differences were not statistically significant between the winning and losing teams except for those of the losing and winning opponents of Kenya. There was a significant difference in the performance of the throw in against Kenya in matches the latter won (60.4%) and lost (39.6%). Thus, on this aspect, the null hypothesis was rejected.

The throw in irrespective as to whether it is awarded in the defensive or offensive third should be well executed to enhance a team's offensive movement. According to Docherty (1978), the throw-in can only be effective if the prospective receivers engage in decoy runs to confuse the opponents. And while it is necessary to practice as many throw in variations as possible in training, players should never lose sight of the fact that there are times when a quickly-taken, unrehearsed throw can catch the opposition off guard (Docherty, 1978). Given that a team is awarded and concedes throw-ins, it has to also practice the defensive variations to counter all the offensive ones.

The throw-in therefore is a situation that has implication for both offensive and defensive play. Going by the pattern shown by Germany and Argentina, the losers have more throw-ins. It appears that a team leading in a match takes the ball out of play regularly for purpose of upsetting the offensive rhythm of the

opponents, to slow them down and to re-organise the defense. On the other hand the team trailing piles pressure so as to equalize. As the latter team piles pressure, the opposing one finds it easier to take the ball out of play so as to re-organise the defensive line as well as interfere with the offensive rhythm of the opponents.

#### Vi Goal attempts:

The results of the attempts at goal are shown in table 20.

**Table 20: Difference in the attempts at goal in won and lost matches for the national teams of Germany, Argentina and Germany.**

Team	Shot	Won	%	Lost	%	Total	t-value
Germany	For	37	56.1	29	43.9	66	0.87
	Against	29	44.6	36	55.4	65	0.82
	Sub-Total	66	50.4	65	49.6	131	0.1
Argentina	For	37	57.8	27	42.2	64	0.67
	Against	45	57.7	33	42.3	78	0.54
	Sub-Total	82	57.7	60	42.7	142	0.90
Kenya	For	32	62.7	19	37.3	51	1.07
	Against	41	45.6	49	54.4	90	1.08
	Sub-Total	73	51.8	68	48.2	141	0.29
	TOTAL	221	53.4	193	46.6	414	0.89

Table 20 shows that the national team of Germany shot at the opponents' goal more times in matches that she won (37) than those she lost (29). Similarly, the opponents had more shots in won (36) than in those they lost to Germany (29). Argentina, also had more shots in matches that she won (37) compared to those lost (27). However, the losing opponents had more shots (45) than those who

won (33). It is noteworthy that whereas the winning Germany team out shot the opponents, that of Argentina was out shot by the opponents both in won and lost matches. Germany was outshot in the matches where the team lost. As for Kenya, the team had less shots in both won (32) and lost (19) matches compared to those of the opponents (41 and 49) respectively. Over all, the matches won by Germany, Argentina and Kenya had slightly more shots (53.4%) than those where they lost (46.6%). However, the difference in the performance of the attempts at goal by the winning and losing teams of Germany, Argentina and Kenya was not statistically significant.

Scoring goals is what football is all about, so accurate and powerful shooting is clearly of the utmost importance (Docherty, 1978). Such shooting is a habit that has to be perfected in practice and transferred to the competitive situation. According to Godik, et. al. (1995) the poor accuracy of shots during training may be one of the reasons for accuracy not being very high in competition. Thus when shooting is not taken seriously in training, the trend is extended to match situations. Yamanaka, et. al. (1995) argued that the more a team shoots the more goals the team scores. This argument is backed by the data for each of the teams of Germany, Argentina and Kenya, where more shots were recorded in matches they won than those they lost. This is in contradiction to Hughes' (1995) argument that more shots are taken when a team is losing than when winning. Dufour (1995) also contends that the higher frequency of shots does

not warrant success. But, it is note worthy that the team with most shots wins in 56% of cases. According to Godik, et al (1995), the number of shots at goal by the winners was statistically greater than that of the losers. Thus, the quality of such shots may be the key determinant of a team's success in a match. Such quality is improved via constant practice in competitive situations.

## Vii Crosses

The results of the cross are shown in table 21.

**Table 21: Difference in the crosses made in matches won and lost by the national teams of Germany, Argentina and Kenya.**

Team	Cross	Won	%	Lost	%	Total	t-value
Germany	For	50	40.3	74	59.7	124	1.4
	Against	42	47.2	47	52.8	89	0.22
	Sub-Total	92	43.2	121	56.8	213	0.57
Argentina	For	30	33.7	59	66.3	89	1.35
	Against	75	67	37	33	112	1.55
	Sub-Total	105	52.2	96	47.8	201	0.25
Kenya	For	68	68.0	32	32.0	100	3.16*
	Against	54	40.9	78	59.1	132	1.57
	Sub-Total	122	52.6	110	47.4	232	0.44
	TOTAL	319	49.4	327	50.6	646	0.17

\* Significant at  $P < .05$ ,  $df=4$ , critical value 2.776.

Table 21 shows that the national team of Germany crossed the ball more in the matches she lost (59.7%) than those where she won (40.3%). However, the opponents crossed the ball more in matches they won against Germany than those where they lost. On the other hand, Germany crossed the ball more than the opponents in both the matches they won and lost.

Argentina also had a higher proportion of crosses in lost matches (66.3%), compared to those won (33.7%). Similarly, the opponents who lost to Argentina had more crosses (67%) than those who won (33%). But contrary to the case of Germany, the winning Argentine teams had fewer crosses than the losing opponents, while they had more of the crosses in the matches lost.

Kenya had more crosses in won matches (68. %) than lost ones (32%). The opponents who lost to Kenya had fewer crosses (40.9%) than those who won (59.1%). In won matches, the national team of Kenya had more crosses than the opponents but had fewer (32) in matches lost to opponents (78). However, other than the difference in the performance between the winning and losing teams of Kenya as it pertains to crosses for, all the others were not significant statistically.

The cross is a vital offensive situation that makes it difficult for defenders to anticipate exactly where and whom the ball will be directed to. The situation provides the much-needed width to a team. Such situations require constant rehearsal if they are to be reproduced in a match situation. According to Dufour (1995) only about 25% of the goals come from a cross in spite of a total efficiency of only 2%. Analysis of the goals in the 14th world cup soccer

tournament revealed that each team relied on the width of attack to break down defenses. A total of 32 goals (27.8%) resulted from crosses.

Comparatively, Germany had a higher inclination to cross the ball followed by Kenya and Argentina. Defensively, Kenya also was vulnerable to more crosses, followed by Argentina and Germany. Thus, Germany were more offensive oriented compared to Argentina and Kenya that were vulnerable to opponent's crosses. Never the less, the losing teams crossed the ball more except for the Kenyan team.

### Viii Heading

Table 22 shows the results of the headings

**Table 22: Difference in the headings executed in matches won and lost by the national teams of Germany, Argentina and Kenya.**

Team	Heading	Won	%	Lost	%	Total	t-value
Germany	For	115	56.4	89	43.6	204	0.73
	Against	94	46.1	110	53.9	204	0.49
	Sub-Total	209	51.2	199	48.8	408	0.21
Argentina	For	77	53.5	67	46.5	144	0.74
	Against	70	55.6	56	44.4	126	0.09
	Sub-Total	147	52.1	135	47.9	282	0.54
Kenya	For	166	61.3	105	38.7	271	1.93
	Against	133	52.8	119	47.2	252	0.48
	Sub-otal	299	57.2	224	42.8	523	1.81
	TOTAL	655	54.0	558	46.0	1213	1.2

Table 22 shows that the players of the national soccer team of Germany headed the ball more in the matches they won (56.4%) than in those they lost (43.6%).

Similarly, the opponents headed the ball more in matches that they beat German

but had fewer where they lost. Additionally Germany had more headings than the opponents in matches won by the former, but fewer in matches won by the latter (opponents). Argentine players also headed the ball more in matches they won (53.5%), than where they lost (46.5%). The opponents however had more headings in matches that they lost (55.6%) than where they won (44.4%) against Argentina. The players of the Argentina team headed the ball more than their opponents in both the matches they won and lost.

The Kenyan players headed the ball more in matches they won (61.3%) than where they lost (38.7%). Similarly, the opponents headed the ball more in the matches they won (52.8%) than lost (47.2%) to Kenya. Also, Kenyan players headed the ball more than the opponents did in the matches won by the former (55.5%) but fewer times where they lost (46.9%).

Comparatively, the players of Germany, Argentina and Kenya headed the ball more in matches they won than where they lost. However, the difference in the headings between the winning and losing teams of Germany, Argentina and Kenya was not statistically significant. The hypothesis that there was no significant difference in the heading of the ball by the winning and losing teams of Germany, Argentina and Kenya was therefore not rejected.

Heading is a vital technique in a footballer. According to Docherty (1978) a footballer is not complete until one has learnt how to use the head both from thinking and a physical point of view. Heading can be done to clear the ball, to pass or score a goal. Thus each of these functions of heading is important and a team's strength or weakness in the air can decide matches. The British teams for example, have demonstrated their superiority in the air (Yamanaka et. al. 1995) thus their reliance on the long lofted pass to unlock defenses. Heading can therefore be incorporated in a team's style of play. In the current study, Kenya headed the ball more followed by Germany and Argentina. These differences though not significant between winners and losers, reflect the style and approach of a team to a soccer game. For example, Cameroon's sterling performance in the 1990 world cup was partly attributed to their strong defensive play where heading featured prominently (Yamanaka et. al, 1995). A team that is therefore endowed with talented headers of the ball in defence and attack stand a good chance to, not only ward off the opponent's attack but can also score from heading opportunities that come their way.

## Free kicks

The results of the free kick are shown in table 23.

**Table 23: Difference in the free kicks taken in matches won and lost by the national teams of Germany, Argentina and Kenya.**

Team	Free kick	Won	%	Lost	%	Total	t-value
Germany	For	66	52	61	48	127	0.71
	Against	46	40.7	67	59.3	113	3.04*
	Sub-	112	46.7	128	53.3	240	1.24
	Total						
Argentina	For	78	55.7	62	44.3	140	0.79
	Against	57	50	57	50.0	114	0
	Sub-	135	53.1	119	46.9	254	0.58
	Total						
Kenya	For	43	53.1	38	46.9	81	0.29
	Against	46	48.9	48	51.1	94	0.26
	Sub-	89	50.9	86	49.1	175	0.17
	Total						
	TOTAL	336	50.2	333	49.8	669	0.095

\* Significant at  $P < .05$ ,  $df=4$ , critical value 2.776

Table 23 shows that the players of the national soccer team of Germany had more free kicks in won (52%) than lost (48%) matches. Similarly, the opponents had more free kicks (59.3%) in the matches that they beat Germany, than where they lost. The German players had more free kicks than opponents in matches won by the former but fewer in matches won by the latter (opponents). Argentine players also took more free kicks in matches they won (55.7%) than where they lost (44.3%). The opponents however, had equal free kicks (50% each) in won and lost matches. The players of Argentina had more free kick than their opponents in both the matches they won (57.8%) and lost (52.1%). The Kenyan players had more free kicks in matches they won (53.1%) than in those they lost (46.9%). Similarly the opponents had more free kicks in

matches they beat (51.1%) than they lost to Kenya (48.9%). In all the matches, the opponents to Kenya had more free kicks, implying that they were fouled or Kenya had more infringements than the opponents did.

Comparatively, the players of Germany, Argentina and Kenya took more free kicks in the matches they won than in those they lost. The difference between the free kicks against Germany in the matches won and lost, was significant statistically. However, all the other differences between the winners and losers were not statistically significant. However, the team that gets free kicks has an advantage in that they can launch an attack on the opponent's goal. With defenses becoming more and more dominant in modern soccer, the planning of goals from set-piece situations such as a free kick has become an important part of any training programme (Docherty, 1978; Njororai, 1996 a, b, c). If players of a team are well trained and organised properly, they have an advantage over the defending side when they are preparing to take the free kick. The advantage is that they know what they are about to attempt while the defenders wait to react when the move is already under way (Docherty, 1978). However, a team should also prepare defensively to counter any offensive strategies that are devised around the free kick situation. Successful defense against free kicks is as valuable as that registered offensively against an opponent.

## X Goal Kick

The results of the goal kick are presented in table 24.

**Table 24: Difference in the goal kicks taken in matches won and lost by the national teams of Germany, Argentina and Kenya.**

Team	Goal kick	Won	%	Lost	%	Total	t-value
Germany	For	29	51.8	27	48.2	56	0.16
	Against	25	59.5	17	40.5	42	0.96
	Sub-Total	54	55.1	44	44.9	98	0.68
Argentina	For	36	60	24	40	60	0.85
	Against	32	54.2	27	45.8	59	0.34
	Sub-Total	68	57.1	51	42.9	119	0.90
Kenya	For	53	53.5	46	46.5	99	0.87
	Against	40	69	18	31	58	2.03
	Sub-Total	93	59.2	64	40.8	157	1.55
	TOTAL	215	57.5	159	42.5	374	1.82

Table 24 shows that the players of the national team of Germany took slightly more goal kicks in the matches they won (51.8%) than where they lost (48.2%). However, the opponents took more goal kicks in the matches they lost (59.5%) than where they won (40.5%). Additionally Germany had more goal kicks than the opponents in both matches won and lost by the former.

Argentina also had a higher proportion of goal kicks in won matches (60%) compared to those in which she lost (40%). The opponents, on the other hand, had more goal kicks (54.2%) in matches lost than where they won (45.8%). The Argentine players took more goal kicks than their opponents in matches won by the former, but the latter had more in those they (opponents) won. The Kenyan players had more goal kicks in matches they won (53.5%) than where they lost (46.5%). On the contrary the opponents had more goal kicks in the matches

they lost (59.2%) than where they won (40.8%). In all the matches, Kenyan players took more goal kicks implying their defensive orientation as well as the offensive nature of their opponents. The fewer goal kicks against Kenya also reflect the lower rate of attack than can force the opponents to put the ball back in play via the goal kicks.

Comparatively, the players of Germany, Argentina and Kenya took more goal kicks in the matches they won than in those they lost. However, Kenya had the highest number (53), followed by Argentina (36) and Germany (29). In lost matches, Kenya again had the highest (46), followed by Germany (27) and Argentina (24). With regard to the opponents, there were more goal kicks in the matches they lost than where they won. However, there was no significant difference between the winners and losers in the performance of the goal kick. The hypothesis that there was no significant difference on the goal kick between the winning and losing teams of Germany, Argentina and Kenya was therefore not rejected.

## XI **Tackle**

The results of the tackle are shown in table 25.

**Table 25: Difference in the tackles executed in won and lost matches for the national teams of Germany, Argentina and Kenya.**

Team	Tackle	Won	%	Lost	%	Total	t-value
Germany	For	154	50.3	140	49.7	294	0.46
	Against	156	49.1	162	50.9	318	0.4
	Sub-Total	310	49.7	302	50.3	612	0.22
Argentina	For	157	57.7	115	42.3	272	1.04
	Against	188	57.7	172	42.3	360	0.66
	Sub-Total	345	57.7	287	42.3	632	1.14
Kenya	For	140	50.9	135	49.1	275	1.03
	Against	118	52.7	106	47.3	224	0.77
	Sub-Total	258	51.7	241	48.3	499	0.76
	TOTAL	903	53.1	798	46.9	1743	1.2

Table 25 shows that the players of the national team of Germany tackled slightly more in won (50.3%) than in lost (49.7%) matches. Similarly, the opponents tackled slightly more in matches they won (50.9%) than lost (49.1%) to Germany. However, in both matches won and lost by Germany, the opponents had more tackles (318) than the former (294). Argentine players tackled more in won (57.7%) than lost (42.3%) matches. In contrast, the opponents had more tackles in lost matches (57.7%) than where they won (42.3%). The opponents of Argentina had more tackles whether they lost (54.5%) or won (59.9%). The Kenyan players tackled slightly more in won (50.9%) than lost (49.1%) matches. In contrast the opponents had more tackles in lost matches (52.7%) than where they won (47.3%). However, Kenyan players out-tackled the opponents in both won and lost matches. This may reflect the physical strength and assertiveness of the Kenyan players vis-à-vis the opponents. Comparatively the players of Germany, Argentina and Kenya tackled more in matches they won than lost. However, Argentina had the highest number of tackles in won matches, followed

by Germany and Kenya. However, in lost matches, Germany had the highest (140) followed by Kenya (135) and Argentina (115). With regard to the difference between the winners and losers on the tackle, there was no statistical significance. Thus the hypothesis that there was no significant difference between the winning and losing teams of Germany, Argentina and Kenya on the tackle was therefore not rejected.

## XII Foul

Table 26 shows the results of the fouling rates in the matches involving Germany, Argentina and Kenya.

**Table 26: Difference in the fouls made in won and lost matches by the national teams of Germany, Argentina and Kenya.**

Team	Foul	Won	%	Lost	%	Total	t-value
Germany	For	42	41.6	59	58.4	101	4.25*
	Against	64	55.2	52	44.8	116	1.33
	Sub-Total	106	48.8	111	51.2	217	0.35
Argentina	For	51	49	53	51	104	0.10
	Against	72	56.7	55	43.3	127	1.16
	Sub-Total	123	53.2	108	46.8	231	0.63
Kenya	For	41	48.8	43	51.2	84	0.21
	Against	42	58.3	30	41.7	72	0.83
	Sub-Total	83	53.2	73	46.8	156	0.59
	TOTAL	312	51.7	292	48.3	604	0.03

\* Significant at  $P < .05$ ,  $df=4$ , critical value 2.776

Table 26 shows that the players of the German team fouled more in lost (58.4%) than won (41.6%) matches. Similarly, the opponents fouled more in matches they lost (55.2%) than where they beat (44.8%) Germany. The difference between the fouls committed by German players in won and lost matches showed statistical

significance. There were significantly more fouls made by the players of the German team in lost matches compared to where they won.

The trend of the fouls shows that losers in matches involving Germany had more infringements than the winners. The players of Argentina also committed more fouls in lost matches (57%) than those they won (49%). Similarly the winning opponents committed fewer fouls (43.3%) than those who won (56.7%). The trend in the matches involving Argentina just as these involving Germany also indicates that the losers fouled more than the winners. Kenyan players also had more fouls in lost (51.2%) than won (48.8%) matches. The opponents also had a similar pattern where the winners committed a fewer proportion of fouls (41.7%) than the winners.

Comparatively, the players of Germany, Argentina and Kenya fouled more in matches they lost than where they won. But whereas the difference between the fouling rate of the winners and losers showed statistical significance in the Germany team, that of the others did not. However, infringements cost a team an offensive opportunity and much needed possession of the ball. The losers, by fouling more give away possession more frequently than the winners. The fouls, though tactically necessary at times, may force a team to slow down on their assertive play to avoid cautioning and possible expulsion from the match. The

high rate of fouling by losers also reflect the frustration of trailing as opposed to leading and being in control.

#### XIV Offensive Play

The results on the offensive play are shown in Table 27.

**Table 27: Difference in the offensive moves made in won and lost matches by the national teams of Germany, Argentina and Kenya.**

Team	Offense	Won	%	Lost	%	Total	t-value
Germany	For	133	48.5	141	51.5	274	0.3
	Against	93	47	105	53	198	0.53
	Sub-Total	226	47.9	246	52.1	472	0.5
Argentina	For	87	40.7	127	59.3	214	0.82
	Against	129	56.6	99	43.4	228	0.54
	Sub-Total	216	48.9	226	51.1	442	0.15
Kenya	For	135	64.9	73	35.1	208	2.84*
	Against	142	44.7	176	55.3	318	6.71*
	Sub-Total	277	52.7	249	47.3	526	0.56
	TOTAL	719	49.9	721	50.1	1440	0.03

\* Significant at  $P < .05$ ,  $df=4$ , critical value 2.776

Table 27 shows that the players of the national soccer team of Germany attacked slightly more in matches they lost (51.5%) than where they won (48.5%). On the contrary, the opponents attacked more in matches they won (53%) against Germany than where they lost (47%). However, Germany attacked more, both in won and lost matches than the opponents. The players of Argentina also attacked more in matches they lost (59.3%) than in those they won (40.7%). Similarly the opponents who lost to Argentina attacked more (56.6%) than in won matches (43.4%). Whereas, Argentina attacked more times than the opponents in lost

matches, they did attack fewer where they won.

The Kenya players, contrary to the German and Argentine ones, attacked (significantly) more in won matches (64.9%) than where they lost (35.1%).

Similarly, the opponents to Kenya attacked more in matches where they beat (55.3%) than where they lost (44.75) to Kenya. However, the Kenyan players attacked fewer times in won (135) and lost (73) matches than their respective opponents, who attacked more, 142 and 176, respectively. The difference between the number of attacking movements in matches won and lost by Kenya was statistically significant. However, the differences between other winners and losers did not reveal any statistical significance.

Attacking movements precede any scoring opportunity. However, the findings in this study are in conformity with Bishovets' et. al. (1995) finding that losers and winners do not differ much on the main parameter of attacking play. Likewise, defensively they did not differ much compared to the winners. In absolute terms, Germany attacked more times (274) than Argentina (214) and Kenya (208). Luhtanen (1995) established that out of all teams at the 1990 world cup soccer tournament, Germany was the strongest team. Germany had the highest number of attacking trials, the lowest number of lost attacks and the highest number of scoring trials both with shots and headers. In the same tournament, Argentina had less attacking trials, as well as shots at goal, compared to

Germany. Likewise in the current study Germany had more attacks than Argentina. However, both teams were ahead of the Kenyan team. But for every attack there must be a defense, which either succeeds to contain it (attack) or fails. Thus, how well a team copes with the opponent's attacks contributes to its over-all success. According to Luhtanen (1995), the success of Argentina in the 1990 world cup was based on the strong defence, excellent goalkeeper, good interplay between "Maradona and Caniggia" and fortune.

The above conclusion was drawn because Argentina had very few attacking situations compared to others that failed to reach the final. However, the long-term success of a team also depends on mastering the game in the offensive third, creating scoring chances and shooting successfully. In these respects, the national team of Germany stands out.

#### **4.2.3 SUCCESSFUL AND UNSUCCESSFUL TECHNICAL EXECUTIONS IN MATCHES INVOLVING GERMANY, ARGENTINA AND KENYA.**

It was hypothesized that there was no significant difference in the successful and unsuccessful execution of the listed technical variables in matches involving the national soccer teams of Germany, Argentina and Kenya:

- i. Throw -in
- ii. Goal attempt
- iii. Free kick

- iv. Heading
- v. Cross
- vi. Goal kick
- vii. Corner
- ix. Penalties
- x. Passes

**Throw-ins**

The results of the throw-in are presented in Table 28.

**Table 28: Successful and unsuccessful throw-ins in the matches involving Germany, Argentina and Kenya.**

A. Successful

Team	Total(Ex)	%	X	Ex2	6n	6n-1
Germany	245	27.8	27.2	7445	9.3	9.8
Argentina	256	29.0	28.4	7520	5.1	5.4
Kenya	381	43.2	42.3	17081	10.3	10.9
Total	882	100	294	270722	61.7	75.5

**ANOVA Summary Table**

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	12682	2	6341	0.6
Within	240641.8	24	10026.7	
Total	241910	26		

$F(2,24) = 0.6$ , and not significant at 0.05

B. Unsuccessful

Team	Total(Ex)	%	X	Ex2	6n	6n-q
Germany	66	20.4	7.3	768	5.6	5.9
Argentina	44	13.6	4.9	282	2.7	2.9
Kenya	213	66	23.7	5335	5.7	6.1
Total	323	100	107.7	51661	75.0	91.9

**ANOVA Summary Table**

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	1876.1	2	938.1	34.9*
Within	644.9	24	26.9	
Total	2521	26		

\*F (2,24) = 34.9, .01 or F with 2 and 24 degrees of freedom is equal to 34.9 and is significant at less than 0.01 level.

Table 28 shows that Kenya's matches were characterized by a high number of both successful (43.2%) and unsuccessful (66%) throw ins. Argentina's matches had the lowest proportion of unsuccessful throw-ins (13.6%). Whereas the difference in the successful execution of the throw-ins was not statistically significant, that of the unsuccessful ones was. Thus the hypothesis that there was no significant difference between the matches involving Germany, Argentina and Kenya in the unsuccessful execution of the throw-in was rejected. Kenya's

matches had a significantly higher number (213) of unsuccessful throw ins compared to 66 for Germany's and 44 for Argentina's matches. A post hoc comparison using the Newman- keuls test showed significant differences in the unsuccessful performances of the throw- ins in matches involving Kenya and those off both Argentina and Germany. The difference in the matches involving the latter two countries was not significant. This implies that Kenya's matches had a high proportion of unsuccessful throw-ins when compared to those of both Argentina and Germany.

The high number of throw-ins in Kenya's matches reflects the erratic clearance, easy loss of possession and the low level of utilization of such situations. These findings concur with earlier findings by Njororai (1993) when comparing the East African teams and European ones. It should be noted that a high number of throw-ins also interfere with the flow of the game as well as a reduction in the effective time that is spent when the ball is in play (Lover, 1986; Muckle, 1981). Such stoppages may reduce spectator enjoyment of the match. The high unsuccessful throw-ins in matches involving Kenya call for more practice on this situation. This is a technical and tactical deficiency that needs to be addressed by coaches.

### **Goal Attempt**

Table 29 presents the findings of the successful and unsuccessful shots at goal in matches involving Germany, Argentina and Kenya.

**Table 29: Goal Attempts in matches involving Germany, Argentina and Kenya**

A. Successful

Team	Total(Ex)	%	X	Ex	6n	6n-1
Germany	90	36.4	10	990	3.2	3.4
Argentina	84	34.0	9.3	862	2.9	3.1
Kenya	73	29.6	8.1	625	1.9	2.0
Total	247	100	82.3	20485	7.0	8.6

**ANOVA Summary Table**

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	16.5	2	8.25	0.98
Within	200.9	24	8.4	
Total	217.4	26		

$F(2,24) = 0.98$ , i.e. F with 2 and 24 degrees of freedom equals 0.98 and is not significant at less than the 0.05 level.

B. **Unsuccessful**

Team	Total(Ex)	%	X	Ex <sup>2</sup>	6n	6n-1
Germany	92	27.6	10.2	994	2.4	2.6
Argentina	111	33.3	12.3	1511	4.0	4.2
Kenya	130	39.1	14.5	2066	4.6	4.9
Total	333	100	111	37685	15.5	19

### ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	80.2	2	40.1	2.5
Within	383.8	24	16	
Total	464	26		

$F(2,24) = 2.5$  and is not significant at less than the 0.05 level.

Table 29 shows that German matches had a higher proportion of successful goal attempts (36.4%), compared to Argentina's (34.0%) and Kenya's (29.6%).

Regarding the unsuccessful goal attempts, Kenya's matches had the highest proportion (39.1%), compared to Argentina's (33.3%) and Germany's (27.6%).

However, over-all, Kenya's matches were characterized by a high inclination to attempt at goal (35.0%) compared to Argentina's (33.6%) and Germany's (31.4%). When the successful and unsuccessful attempts at goal are compared across the different matches, no significant difference was established. Thus the null hypothesis that there was no significant difference in the execution of successful and unsuccessful shots at goal in matches involving Germany, Argentina and Kenya was not rejected.

The goal attempts did not differ significantly among the German, Argentina and Kenya's matches. However, the German matches had a higher success rate, whereas Kenya's had the highest unsuccessful shots. The high rate of

unsuccessful shots accounts for the low scoring average per match in the modern game. Such attempts at goal may be out of sheer desperation rather than effective strategy. There is need for coaches to improve on the accuracy level of the teams while in front of goal. Winning of matches depends heavily on the sharpness of a team in front of the goal. A team requires perfect constructive and attacking strategies and variations. It requires to be aggressive around the penalty area and must have a killer finisher among the forward players (Michels, 1996).

### Free Kick

Table 30 presents the results of the successful and unsuccessful free kicks in matches involving Germany, Argentina and Kenya.

**Table 30: Free Kicks in matches involving Germany, Argentina and Kenya**

#### A. Successful

Team	Total(Ex)	%	X	Ex2	6n	6n-1
Germany	295	40.1	32.8	9915	5.2	5.5
Argentina	299	40.6	33.2	10209	5.5	5.9
Kenya	142	19.3	15.8	2402	4.2	4.5
Total	736	100	245.3	196590	73.1	89.5

### ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	1780.4	2	890.2	31.2*
Within	682.8	24	28.5	
Total	2463.2	26		

\*F (2,24) = 31.2, P < . 01, i.e. is significant at less than 0.01 level.

### B. Unsuccessful

Team	Total(Ex)	%	x	Ex <sup>2</sup>	6n	6n-1
Germany	59	20.2	6.6	435	2.3	2.5
Argentina	91	31.2	10.1	997	2.9	3.1
Kenya	142	48.6	15.8	2524	5.6	6.0
Total	292	100	97.3	31926	34.2	41.9

### ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	389.4	2	194.7	11.5*
Within	408.7	24	17	
Total	798.1	26		

\*F (2,24) = 11.5, and is significant at less than the 0.01 level.

Table 30 shows that the matches involving Kenya had the least proportion of successful free kicks (19.3%), compared to Argentina's (40.6%) and Germany's (40.1%). For the unsuccessful free kicks, Kenya's matches had the highest proportion (48.6%), compared to Argentina's (31.2%) and Germany's that had the least proportion (20.2%). Overall, Argentina's matches had the highest proportion of free kicks (38.0%), followed by Germany's (34.4%) and Kenya's (27.6%).

There was a statistically significant difference in the execution of both successful and unsuccessful free kicks in the matches involving Germany, Argentina and Kenya. A post hoc comparison using the Newman-Keuls test showed significant differences in the successful performance of the free kicks between both Argentinean and German matches and those involving Kenya. The difference between Argentina's and those for German matches was not significant.

Regarding the unsuccessful free kicks, the post hoc test showed significant differences between Kenyan matches, on one hand and those for Argentina and Germany, on the other. Kenyan matches were characterised by a low success ratio of free kicks when compared to those for Argentina and Germany.

The matches involving Kenya had the least proportion of successful free kicks but had the highest proportion of the unsuccessful ones. Fifty percent of free kicks in matches involving the Kenyan team were unsuccessfully taken, whereas there were only 17% and 23% in matches involving Germany and Argentina

respectively. The poor delivery from free kicks, especially in matches involving Kenya, is a worrying trend. Similar worries have been expressed by UEFA (1996b) in European competitions as evidenced by Euro'96 where only four goals were scored as a result of free kicks.

## Heading

The results of the successful and unsuccessful headings are shown in Table 31.

**Table 31: Heading in matches involving Germany, Argentina and Kenya**

### A. Successful

Team	Ex	%	x	Ex2	6n	6n-1
Germany	310	33.8	34.4	11536	9.8	10.4
Argentina	218	23.8	24.2	5524	5.2	5.5
Kenya	389	42.4	43.2	18713	14.5	15.4
Sub-total	917	100	305.7	294945	69.9	85.6

## ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	1627.6	2	813.8	6.5*
Within	3001.4	24	125.1	
Total	4629	26		

$F(2,24) = 6.6$ ,  $P < .01$ , and is significant at less than 0.01 level

B. Unsuccessful

Team	Ex	%	x	Ex2	6n	6n-1
Germany	351	35.6	39	15187	12.9	13.7
Argentina	228	23.1	25.3	6300	7.6	8.1
Kenya	408	41.3	45.3	19896	12.5	13.2
Sub-total	987	100	329	341649	75.1	92

**ANOVA Summary Table**

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	1880.7	2	940.4	6.6*
Within	3422	24	142	
Total	5302.7	26		

\*  $F(2,24) = 6.6$ ,  $P < .01$ , and is significant at less than 0.01 level

Table 31 shows that Kenya's matches had the highest number of successful headers (42.4%) compared to Germany's (33.8%) and Argentina's (23.8%).

The same pattern is noticeable in the unsuccessful headings with Kenya's matches leading with a proportion of 41.3% compared to Germany's 35.6% and Argentina's 23.1%. The over-all data shows that Kenya's matches had majority of the headings (41.9%), followed by Germany's (34.7%) and Argentina's (23.4%) respectively.

There was a statistically significant difference in the heading of the ball both successfully and unsuccessfully in matches involving the national soccer teams of Germany, Argentina and Kenya. A post hoc comparison using Newman-keuls test showed significant difference in the successful heading of the ball between Kenyan and Argentinean matches. The matches involving Kenya did not reveal any significant difference with those involving Germany as well as between the latter and for Argentina. On the unsuccessful heading of the ball, the post hoc comparison test showed significant differences in the matches involving Argentina and those for both Kenya and Germany. Argentinean matches had the lowest number of unsuccessful headings. The matches involving Kenya had the highest proportion of both successful and unsuccessful heading of the ball. Fifty-one percent of the headings in the matches involving the Kenya team were unsuccessfully executed, whereas there were 53% for Germany's and 51% for Argentina. Argentina and Kenya therefore were slightly better on the ratio of successful versus unsuccessful headings. Although Kenya's matches had significantly more successful and unsuccessful headings, there was no major difference in the success ratio for all the matches. The high number of headings and the high proportion of unsuccessfully executed ones calls for serious consideration by the coaches and the players. Heading is used for passing, clearing and scoring goals (Docherty, 1978). It is therefore vital that it is perfected to allow players to effectively defend, pass and score goals. Perfection

of heading is vital especially to contend with high crosses, floated corners and lofted free kicks both defensively and offensively.

## V. Cross

Table 32 presents the findings of the successful and unsuccessful crosses in matches involving the national teams of Germany, Argentina and Kenya.

**Table 32: Crosses in matches involving Germany, Argentina and Kenya**

### A. Successful

Team	Total(Ex)	%	X	Ex2	6n	6n-1
Germany	98	34.9	10.9	1308	5.2	5.5
Argentina	100	35.6	11.1	1290	4.5	4.7
Kenya	83	29.5	9.2	963	4.7	5.0
Total	281	100	93.7	26493	7.6	9.3

### ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	19.1	2	9.6	0.4
Within	617.4	24	25.7	
Total	636.5	26		

$F(2,24) = 0.4$  and is not significant at less than 0.05 level

B. Unsuccessful

Team	Total(Ex)	%	x	Ex2	6n	6n-1
Germany	186	31.7	20.7	4128	5.6	0.6
Argentina	187	31.9	20.8	3921	02	2.1
Kenya	214	36.4	23.8	5468	6.5	6.9
Sub-total	587	100	195.7	115361	13	15.9

**ANOVA Summary Table**

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	56	2	28	0.96
Within	699.2	24	29.1	
Total	755.2	26		

F (2,24) = 0.96, and is not significant at less than the 0.05 level.

Table 32 indicates that Kenya's matches had the least proportion of accurate crosses (29.5%) compared to Germany's (34.9%) and Argentina's (35.6%).

Additionally, Kenya's matches had the highest proportion of inaccurate crosses (36.4%) compared to Germany's (31.7%) and Argentina's (31.9%) matches.

The overall findings show that Kenya's matches had the highest proportion (34.2%) of crosses as compared to Germany's (32.7%) and Argentina's (33.1%).

The number of successful and unsuccessful crosses did not differ significantly among the matches involving Germany, Argentina and Kenya. However, Kenya's matches had more unsuccessful crosses and the least successful ones.

Cumulatively, Kenya's matches had more crosses. All the matches were characterized by a higher ratio of unsuccessful as compared to the successful crosses. For Kenya's matches the unsuccessful crosses accounted for 72.1%, Germany's 65.5% and Argentina's 65.2% respectively. The high rate of poorly executed crosses has also been witnessed in other competitions (El Wahsh, 1996, El Wahsh et. al, 1992; Nepfer, 1996; UEFA, 1996d). According to Dufour (1995) about 25% of the goals come from a cross in spite of a total efficiency of only 2%. More than 70% of the crosses give no effect because of a bad direction or an interception, and only 10% give an opportunity for a shot from 11m which has a high efficiency of 21%. He concluded that good centres are very difficult but also very effective. Thus there is need to improve on the quality of crosses, not only in the Kenyan, Germany and Argentina teams, but also globally. An improvement in the quality of crosses is bound to positively influence the rate of scoring in soccer matches.

### **Goal Kick**

The results of the successful and unsuccessful goal kicks are shown in Table 33.

**Table 33: Goal Kicks in matches involving Germany, Argentina and Kenya.**

**A. Successful**

Team	Total(Ex)	%	X	Ex <sup>2</sup>	6n	6n-1
Germany	98	27.8	10.9	1192	3.7	4.0
Argentina	107	30.3	11.9	1387	3.6	3.8
Kenya	148	41.9	16.4	2746	5.9	6.2
Total	353	100	117.7	42957	21.8	26.7

**ANOVA Summary Table**

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	157.9	2	79	3.43*
Within	552	24	23	
Total	709.9	26		

\*F (2,24)= 3.43, P< .05 i.e. is significant at less than 0.05 level.

**B. Unsuccessful**

Team	Total(Ex)	%	X	Ex	6n	6n-1
Germany	45	22.2	0.5	311	3.1	3.3
Argentina	64	31.5	7.1	552	3.3	3.5
Kenya	94	46.3	10.4	1272	5.7	6.0
Total	203	100	67.7	14957	20.2	24.7

## ANOVA Summary Table

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	135.6	2	67.8	3.44*
Within	473.1	24	19.7	
Total	608.7	26		

\*F (2,24) = 3.44, P<. 05 i.e. is significant at less than 0.05 level.

Table 33 shows that Kenya's matches had the highest proportion of successful goal kicks (41.9%) compared to Germany's (27.8%), and Argentina's (30.3%). Similarly, Kenya's matches had a higher proportion of unsuccessful goal kicks (46.3%), compared to 22.2% and 31.5% for Germany's and Argentina's respectively. The over-all data shows that Kenya's matches had the majority of goal kicks (43.5%), followed by Argentina's (30.8%) and Germany's (25.7%) respectively. The execution of both the successful and unsuccessful goal kicks in matches involving Germany, Argentina and Kenya was found to be significantly different. The null hypothesis that there was no significant difference in the performance of the goal kick in matches involving the national soccer teams of Germany, Argentina and Kenya was rejected at P<0.05 level. However, a post hoc comparison using Newman- keuls test did not show any significant difference in the successful delivery of the goal kicks in matches involving Kenya, Argentina and Germany. Regarding the unsuccessful goal kicks, there was significant difference between German matches and those for both Kenya and Argentina.

German matches, therefore, were characterised by a low tally of unsuccessful goal kicks when compared to those for Kenyan and Argentinean matches.

The matches involving the Kenya team had a higher proportion of both successful and unsuccessful goal kicks. The latter accounted for 38.8%, while for Argentina's it was 37.4% and Germany's 31.5% were unsuccessful. Being the first offensive action after the restart, there is need to improve on its execution. A higher proportion of unsuccessful goal kicks reflects the loss of possession especially with use of the long kicks.

It also manifests itself when a team is constantly under pressure, with the opponents shooting off-target. Yamanaka et. al. (1995) attributed such a high frequency of goal kicks to defensive play. However, such an interpretation may not accurately reflect the whole action on the field of play. It appears that goal kicks are a result of inefficient attacks of one team and the over defensive nature of the other. In this case, the matches involving Kenya may fall in this category of frequent yet inefficient offensive play of one team coupled with an over defensive nature of the other.

### **Corner**

Table 34 presents the findings of the successful and unsuccessful corner kicks taken in matches involving the national soccer teams of Germany, Argentina and Kenya.

**Table 34: Corner kicks in matches involving Germany, Argentina and Kenya.**

**A. SUCCESSFUL**

Team	Total(Ex)	%	X	Ex2	6n	6n-1
Germany	46	42.6	5.1	316	3.0	3.2
Argentina	38	35.2	4.2	180	1.5	1.7
Kenya	24	22.2	2.7	98	1.9	2.1
Total	108	100	36	4136	9.1	11.1

**ANOVA Summary Table**

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	27.5	2	13.75	2.5
Within	134.5	24	5.6	
Total	162	26		

$F(2,24) = 2.5$  i.e. F with 2 and 24 degrees of freedom equals 2.5 and is not significant at less than 0.05 level.

**B Unsuccessful**

Team	Total(Ex)	%	x	Ex2	6n	6n-1
Germany	52	40.6	5.8	374	2.9	3.0
Argentina	28	21.9	3.1	114	1.7	1.8
Kenya	48	37.5	5.3	332	2.9	3.1
Total	128	100	42.7	5792	10.5	12.9

**ANOVA Summary table**

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	36.7	2	18.4	2.5
Within	176.5	24	7.4	
Total	213.2	26		

$F(2,24) = 2.5$ , i.e.  $F$  with 2 and 24 degrees of freedom equals 2.5 and not significant at less than 0.05 level.

Table 34 shows that Kenya's matches had the lowest proportion (22.2%) of successful corners compared to Germany's (42.6%) and Argentina's (35.2%). Regarding the unsuccessful ones, Kenya's had 37.5%, compared to 40.6% for Germany's and 21.9% for Argentina's matches. Over all, Germany's matches had a higher proportion of corners (41.5%), while Kenya's and Argentina's trailed with 30.5% and 28% respectively.

The corner kick is a vital offensive weapon in competitive matches. The results on its execution in matches involving Germany, Argentina and Kenya did not differ significantly both for the successful and unsuccessful ones. The null hypothesis that there was no significant difference in the performance of the successful and unsuccessful corner kick in matches involving the teams of Germany, Argentina and Kenya was therefore not rejected.

The matches involving Germany had a higher proportion of both the successful and unsuccessful corner kicks compared to those in matches involving Argentina and Kenya. Matches involving Kenya had a lower number of successful corner kicks. However, the proportion of successful to the unsuccessful kicks for the matches involving Kenya, Germany and Argentina was 33.3%, 46.9% and

57.6%. In terms of efficiency Argentina and Germany's matches were much better at the corner kick than those of Kenya. It is important that a corner, being an offensive standard situation be well rehearsed on the training field if the level of success is to be raised especially in Kenyan matches. An improvement in the effectiveness of the corner kicks, will no doubt, increase the chances of scoring (UEFA, 1996b).

### **Penalty**

There were a total of eight penalties awarded, with matches involving Germany having four, Argentina's three and Kenya's one. All the eight penalties awarded were successfully converted. At high level competition, a team should be well prepared so as to maximize the scoring through chances that come their way. Hence, a penalty, which is not converted, can be quite costly to the aspirations of a team. For example in Euro'96, even balanced matches were often decided either by the success or failure to convert a penalty kick (UEFA, 1996 a). A penalty is one of the critical situations, that a potential winning team creates and utilizes fully (Byshovets, et. al. 1995).

### **Pass**

Table 35 presents the findings of the unsuccessful and successful passes in matches involving Germany, Argentina and Kenya.

**Table 35: Passes in matches involving Germany, Argentina and Kenya****A. Successful**

Team	Total (Ex)	%	x	Ex2	6n	6n-1
Germany	5743	35.1	638.1	3698409	61.2	64.9
Argentina	5980	36.5	664	4040506	86.4	91.6
Kenya	4653	28.4	517	2427705	49.6	52.6
Total	16376	100	5458.7	90392858	577.9	707.7

**ANOVA Summary Table**

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	111303.6	2	55651.8	10.9
Within	122969	24	5123.7	
Total	234272.7	26		

\*F (2,24) = 10.9, P < . 01 with 2 and 24 degrees of freedom equals 10.9 and is significant at less than 0.01 level.

**B. Unsuccessful**

Team	Total (Ex)	%	-x	Ex2	6n	6n-1
Germany	1475	26.6	166.1	265813	44.1	46.7
Argentina	1578	28.0	175.3	286660	33.3	35.3
Kenya	2556	45.4	284	759082	60.7	64.4
Total	5629	100	1876.3	11258245	481.8	590.1

## ANOVA SUMMARY TABLE

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	77373.8	2	38686.9	15.3*
Within	60638.9	24	2526.6	
Total	138012.7	26		

$F(2,24) = 15.3$ ,  $P < .01$ , i.e. F with 2 and 24 degrees of freedom equals 15.3 and is significant at less than 0.01 level.

Table 35 shows that the matches involving Kenya had the lowest proportion of successful passes (28.4%), compared to those for Germany (35.1%) and Argentina (36.5%). Regarding the unsuccessful passes, Kenya's matches had the highest proportion (45.4%), while Germany's and Argentina's matches had 26.6% and 28.0% respectively. Over-all, Argentina's matches had the highest proportion of passes (34.3%), followed by those of Germany's (32.9%) and Kenya's (32.8%).

The execution of both the successful and unsuccessful passes in matches involving Germany, Argentina and Kenya was found to be significantly different. The null hypothesis that there was no significant difference in passing of the ball in matches involving the national soccer teams of Germany, Argentina and Kenya was rejected at  $P < .01$ . A post hoc comparison using Newman- keuls test showed significant difference in the successful passes in matches involving Kenya

and those for both Argentina and Germany. No difference was established between German and Argentinean matches. On the unsuccessful passes, the post hoc comparison test similarly showed a significant difference between Kenyan matches and those for both Germany and Argentina. Kenyan matches were at variance with those for Germany and Argentina with regard to passing of the ball.

Regarding the passing, the matches involving Argentina had the highest proportion of the total passes, including the successful ones. The matches involving Kenya had a higher share of the unsuccessful ones. The success level exhibited in the Kenyan, German and Argentina matches was 64.5%, 79.3% and 79.1% respectively. Germany's and Argentina's matches, therefore, had better ball possession compared to the Kenyan ones.

Passes are the most prevalent technical and tactical tools that a team has to master if it is to outwit the opponents. It is the essence of a team game; hence the team with a higher success rate at passing tends to possess the ball better and hence has better opportunities to attack. (Docherty, 1978; Wade 1970).

According to Dufour (1995), 62% of winning teams tend to play longer with the ball than do the losing teams. However, the domination in ball possession does not guarantee success. For example, in the 1990 world cup finals, only 12% of attacks happened with counters with a good efficiency of 12% and 88% of

attacks were developed in a slow way but with a low efficiency of 7%. The more a ball is passed the more chances that the opponent will intercept it or that it will be delivered inappropriately.

Germany the winner in 1990 was highly efficient in long passes (65%) but countries such as Scotland and Egypt were totally inefficient with the latter missing the target 44 out of 51 long passes. Yet in the 1982 world cup tournament, 80% of the goals were made with only four passes (Dufour, 1995).

Thus the passing should be purposeful and well directed to a teammate well placed to utilize the ball. It is a supreme art and the sign of a great player if one can control a ball, and instantly deliver a perfect pass to a teammate who is in motion (Creek, 1974).

### Tackle

The results of the successful and unsuccessful tackles are presented in table 36.

**Table 36: Tackles in matches involving Germany, Argentina and Kenya.**

#### A. Successful

Team	Total(Ex)	%	x	Ex2	6n	6n-1
Germany	502	31.8	55.8	28592	8.1	8.6
Argentina	605	38.3	67.2	42095	12.6	13.3
Kenya	472	29.9	52.4	25300	7.8	8.3
Total	1579	100	526.3	840813	57	69.8

**ANOVA Summary Table**

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	1081.3	2	540.7	5.1*
Within	2563.4	24	106.8	
Total	3644.7	26		

\*F (2,24) = 5.1, P < .05, i.e., F with 2 and 24 degrees of freedom equals 5.1 and is significant at the 0.05 level.

**B. Unsuccessful**

Team	Total (Ex)	%	x	Ex2	6n	6n-1
Germany	412	37.9	45.8	19346	7.3	7.8
Argentina	330	30.4	36.7	12606	7.5	8.0
Kenya	345	31.7	38.3	13829	8.2	8.7
Total	1087	100	362.3	397669	35.6	43.7

**ANOVA Summary Table**

Source	Sum of Squares	Degrees of Freedom	Mean square	F- value
Between	423.6	2	211.8	3.2
Within	1595.6	24	66.5	
Total	2019.2	26		

F (2,24) = 3.2 i.e. F with 2 and 24 degrees of freedom is equal to 3.2 and is not significant at the 0.05 level.

Table 36 shows that Kenya's matches had the lowest proportion of the successful tackles (29.9%), while Germany's and Argentina's had 31.8% and 38.3% respectively. The unsuccessful tackles in Kenya's matches were 31.7% compared to 37.9% for Germany's and 30.4% for Argentina's matches. Over all, Argentina's matches had a higher proportion of tackles (35.1%), compared to 34.3% for Germany's and 30.6% for Kenya's matches.

The successful and unsuccessful tackles in matches involving Germany, Argentina and Kenya were found to be significantly different. The null hypothesis that there was no significant difference in the execution of the tackles in matches involving the national soccer teams of Germany, Argentina and Kenya was rejected at  $P < .05$  level. A post hoc comparison using the Newman-keuls test showed significant difference in the successful tackles in matches involving Argentina and Kenya. However, no significant difference was established between German and Argentinean ones as well as between German and Kenyan matches.

Cumulatively Argentina and Germany's matches had more tackles compared to Kenya's. With regard to the success ratio of the tackles executed, the Kenyan, German and Argentina matches had 57.8%, 54.9% and 64.7% respectively. The

tackles in the Kenyan matches were therefore fairly successful though the Argentina's were the most effective.

#### 4.2.4 EFFECTIVE EXECUTION OF TECHNICAL VARIABLES

It was hypothesized that there was no significant difference in the successful and unsuccessful performance of winning and losing teams in matches involving Germany, Argentina and Kenya on the following technical variables:

- I. Pass
- II. Corner Kick
- III. Throw in
- IV. Goal attempt
- V. Cross
- VI. Heading
- VII. Free kick
- VIII. Goal kick
- IX. Tackle

##### **Pass**

The results of the successful and unsuccessful performance of the pass by the winning and losing teams in matches involving Germany, Argentina and Kenya are presented in Table 37.

**Table 37: The difference in the effective execution of passes by the winning teams in matches involving Germany, Argentina and Kenya.**

Match	Effect	Won No.	%	Lost No.	%	Total	t-value	Comment
Germany	S.	2085	53.8	1789	46.2	3874	2.46	NS
	US	502	51	482	49	984	0.14	NS
	Sub-T	2587	53.3	2271	46.7	4858	0.34	NS
Argentina	S	2133	52.3	1942	47.7	4075	0.68	NS
	US	534	50.1	532	49.9	1066	0.02	NS
	Sub-T	2667	51.9	2474	48.1	5141	0.2	NS
Kenya	S	1458	47.9	1583	52.1	3041	0.77	NS
	US	950	59.6	645	40.4	1595	2.38	NS
	Sub-T	2408	51.9	2228	48.1	4636	0.35	NS
Total		7662	52.4	6973		14635		

Key S=successful, US=unsuccessful and sub-T=sub-total.

Table 37 shows that the matches where the national team of Germany won had a higher percentage of successful passes (53.8%) than where they lost (46.2%).

There were also slightly more unsuccessful passes (51%), than in the lost matches (49%). Over all there were more passes (53.3%) made in matches won by Germany than where she lost (46.7%). In matches involving Argentina, there were more successful passes where she won (52.3%), than where she lost (47.7%). The unsuccessful passes were also slightly more in matches won by Argentina (50.1%), than where she lost. Cumulatively, the matches won by Argentina, like in the case of Germany, had more passes (51.9%) than where she lost (48.1%).

However, the case of Kenya is different. The matches where she won, had fewer successful passes (47.9%), than where she lost (52.1%). The

unsuccessful passes were more in matches won by Kenya (59.6%) than where she lost (40.4%). Cumulatively, there were more passes, both successful and unsuccessful, in matches won by Kenya (51.9%) than where she lost (48.1%).

The differences between the successfully and unsuccessfully executed passes in matches won and lost by the respective teams of Germany, Argentina and Kenya proved not to be significant statistically. The results reveal the relative similarity of matches with regard to the average passes successfully and unsuccessfully executed. This tallies with Lanham's (1995) assertion that for all teams everywhere at every level, however they play, there are the same patterns of chance that occur and recur over a series of games. Although an individual team may not pass the ball as successfully as the opponent, the latter compensates by having more of the successful passes. Further researcher is advocated for to establish the variation of passes both successful and unsuccessful, in different matches on a more comprehensive scale.

### **Corner Kick**

Table 38 shows the results of the successfully and unsuccessfully executed corner kick in won and lost matches involving Germany, Argentina and Kenya.

**Table 38: The difference in the effective execution of corners by the winning and losing teams in matches involving Germany, Argentina and Kenya.**

Match	Effect	Winner No.	%	Lost No.	%	Total No.	t-value	Comment
Germany	S	17	53.1	15	46.9	32	.19	NS
	US	12	29.3	27	70.7	41	2.94*	SIGN
	Sub-T	29	40.8	42	59.2	71	1.1	NS
Argentina	S	17	60.7	11	39.3	28	2.17	NS
	US	04	28.6	10	71.4	14	2	NS
	Sub-T	21	50	21	50	42	0	NS
Kenya	S	10	45.5	12	54.5	22	0.49	NS
	US	14	50	14	50	28	0	NS
	Sub-T	24	48	26	52	50	0.41	NS
Total		74	45.4	89	54.6	163		

\*  $P < .05$ ,  $df=4$ , Critical Value 2.776.

Table 38 shows that the matches where the national team of Germany won had a higher percentage of successful corner kicks (53.1%), than where they lost (46.2%). There were however, significantly less unsuccessful corner kicks in matches won by Germany (29.3%) compared to where they lost (70.7%). Overall, matches won by Germany had fewer corner kicks (40.8%) compared to where they lost (59.1%). In matches involving Argentina, there were similarly more successful corner kicks in matches won by Argentina (60.7%) than where they lost (39.3%). Just like in German matches, the unsuccessfully executed corner kicks were fewer in matches won by Argentina (28.6%) than where they lost (71.4%). However, the case of Kenya is different. The matches where she won had fewer successful corners kick (45.5%), than where she lost (54.5%). The unsuccessful corner kicks were however equal in proportion (50%) in both won and lost matches. The sub-total in matches involving Kenya show that there were fewer

corner kicks in won (48%) than in lost (52%) matches.

Apart from the significant difference in the unsuccessful execution of corner kicks between the matches won and lost by Germany the others were not. The null hypothesis that there was no significant difference in the successful and unsuccessful execution of corner kicks in matches won and lost by Germany, Argentina and Kenya could not be rejected. The results reveal that there was more offensive and defensive activity around the corner kick situation in matches won and lost by Germany when compared to those of Argentina and Kenya. However, there was no significant variation in the pattern of executing the corner kick in matches won and lost by the respective teams, except the unsuccessful ones in German matches.

### **Throw in**

The results of the successful and unsuccessful performance of the throw in by the winning and losing teams in matches involving Germany, Argentina and Kenya are presented in table 39.

**Table 39: The difference in the effective execution of throw-ins by the winning and losing teams of Germany, Argentina and Kenya.**

Match	Effect	Won No.	%	Lost No.	%	Total	t-value	Comment
Germany	S	71	46.4	82	53.6	153	0.52	NS
	US	29	67.4	14	32.6	43	0.81	NS
	Sub-T	100	51	96	49	196	0.1	NS
Argentina	S	74	42.8	99	57.2	173	1.8	NS
	US	23	67.6	11	32.4	34	1.8	NS
	Sub-T	97	46.9	110	53.1	207	0.27	NS
Kenya	S	140	58.8	98	41.2	238	2.59	NS
	US	66	53.2	58	46.8	124	0.74	NS
	Sub-T	206	56.9	156	43.1	362	1.20	NS
Total		403	52.7	362	47.3	765		

Table 39 shows that the matches where Germany won had a fewer proportion of successful throw-ins (46.4%) than where they lost (53.6%). In contrast, the matches where Germany won had more unsuccessful throw-ins (67.4%), than where they lost (32.6%). Over all, there were slightly more throw-ins in matches won by Germany (51%) than where she lost (49%). In matches involving Argentina, there were fewer successful throw-ins in matches she won (42.8%), than where she lost (57.2%). The unsuccessful throw-ins were however more in matches won by Argentina (67.6%), than where she lost (32.4%). Cumulatively, the matches where Argentina lost had more throw-ins (53.1%), than where she won (46.9%). In contrast to the matches won by Germany and Argentina, those won by Kenya had more successful throw ins (58.8%), than where the latter lost (41.2%). The unsuccessful throw-ins were also more in matches won by Kenya (53.2%), than where she lost (46.8%). Cumulatively, there were more throw ins, both successful and unsuccessful, in matches won by Kenya (56.9%) than where

she lost (43.1%).

The differences between the successfully and unsuccessfully taken throw-ins in won and lost matches by the respective teams of Germany, Argentina and Kenya were not statistically significant. The results reveal, however, that there were more throw-ins in matches involving Kenya irrespective of the result. The trend of the throw-ins is relatively similar in both won and lost matches by the respective teams of Germany, Argentina and Kenya. Despite the slight differences in approach to the game with regard to the frequency of throw-ins the null hypothesis that there is no significant difference in the successful and unsuccessful execution of the throw-ins by winning and losing teams in matches involving Germany, Argentina and Kenya was not rejected.

### Goal Attempt

Table 40 shows the results of the successfully and unsuccessfully taken shots at goal in won and lost matches involving Germany, Argentina and Kenya.

**Table 40: The difference in the effective execution of attempts at goal by the winning and losing teams of Germany, Argentina and Kenya.**

Match	Effect	Won No.	%	Lost No.	%	Total	t-value	Comm ent
Germany	S	34	54	29	46	63	0.46	NS
	US	32	47.1	36	52.9	68	0.62	NS
	Sub-T	66	50.4	65	49.6	131	0.11	NS
Argentina	S	33	56.9	25	43.1	58	0.82	NS
	US	49	58.3	35	41.7	84	1.77	NS
	Sub-T	82	57.7	60	42.3	142	1.61	NS
Kenya	S	26	52	24	48	50	0.33	NS
	US	47	51.6	44	48.4	91	0.21	NS
	Sub-T	73	51.8	68	48.2	141	0.28	NS
Total		221	53.4	193	46.6	414		

Table 40 shows that the matches where the national team of Germany won had a higher percentage of successful shots (54%) than where they lost (46%). There were however, slightly less unsuccessful shots in matches they lost (52.9%). The sub-total shows that there were slightly more attempts at goal in matches won by Germany (50.4%) than when they lost (49.6%). In matches involving Argentina, there were more successful shots at goal in matches she won (54%), than where she lost (46%). On the contrary, there were fewer unsuccessful shots in matches she won (47.1%) than where she lost (52.9%). Over all the matches won by Argentina had more shots (57.7%) than where she lost (42.3%).

However, the case of Kenya is slightly different from the trends revealed in matches involving Germany and Argentina. The matches that were won by Kenya had a higher proportion of both successful and unsuccessful shots (52% and 51.6%) compared to where she lost (48% and 48.4%) respectively. There were therefore more shots executed in matches won by Kenya (51.8%) than where she lost (48.2%).

Successful execution of shots is a hallmark of offensive play that provides positive experiences to the players, coaches and spectators in the game of soccer (Luhtanen, 1995). Thus a team that shoots more at goal exhibits the drive to score goals. It is apparent that the shooting in won and lost matches is basically similar. What may vary is the level of success of the shots at goal.

Otherwise, the successful shots in matches a team wins will also be replicated in the match lost. It is, therefore, not surprising that there was no significant difference in the successful and unsuccessful execution of shots at goal between matches won and lost by Germany, Argentina and Kenya.

### Cross

The results of the successful and unsuccessful execution of the cross by the winning and losing teams in matches involving Germany, Argentina and Kenya are presented in table 41.

**Table 41: The difference in the effective execution of the crosses by the winning and losing teams of Germany, Argentina and Kenya.**

Match	Effect	Won No.	%	Lost No.	%	Total No	T-value	Comment
Germany	S	32	41	46	59	78	1.02	NS
	US	60	44.4	75	55.6	135	0.91	NS
	Sub-T	92	43.2	121	56.8	213	1.11	NS
Argentina	S	37	51.4	35	48.6	72	0.11	NS
	US	68	52.7	61	47.3	129	2.45	NS
	Sub-T	105	52.2	96	47.8	201	0.39	NS
Kenya	S	32	45.1	39	54.9	71	0.4	NS
	US	90	55.9	71	44.1	161	1.3	NS
	Sub-T	122	52.6	110	47.4	232	0.36	NS
Total		319	49.4	327	50.6	646		

Table 41 shows that the matches won by Germany had fewer successful crosses (41%) than where they lost (59%). Similarly, there were fewer unsuccessful crosses in matches won by Germany (44.4%) compared to where she lost

(55.6%). Over all, there were fewer crosses in matches won (43.2%) than lost (56.8%) by the national team of Germany. The matches won by Argentina had more successful (51.4%) as well as unsuccessful ones (52.7%) compared to where she lost (48.6% and 47.3%) respectively. Cumulatively, the matches won by Argentina had more (52.2%) of the crosses than where she lost (47.8%).

The trend in the matches won by Kenya show that there were fewer successful crosses (45.1%) than where she lost (54.9%). In contrast, there were more unsuccessful crosses in matches won by Kenya (55.9%) compared to when she lost (44.1%). There were more crosses in matches won (52.6%) by Kenya than where she lost (47.4%). The null hypothesis that there was no significant difference in successful and unsuccessful execution of crosses between matches won and lost by Germany, Argentina and Kenya was not rejected. The pattern of crossing is similar in matches won and lost. The similarity reflects the mastery by a team of the fundamental techniques and tactics applied in a game irrespective of the result.

### **Heading**

The results of the successful and unsuccessful execution of the heading between the matches won and lost by Germany, Argentina and Kenya are shown in Table 42.

**Table 42: The difference in the effective execution of the headings by the winning and losing teams of Germany, Argentina and Kenya.**

Match	Effect.	Won No.	%	Lost No	%	Total No	t-value	Comment
Germany	S	105	52.5	95	47.5	200	0.29	NS
	US	104	50	104	50	208	0	NS
	Sub-T	209	51.2	199	48.8	408	0.21	NS
Argentina	S	75	51.7	70	48.3	145	0.41	NS
	US	72	52.6	65	47.4	137	0.31	NS
	Sub-T	147	52.1	135	47.9	282	0.53	NS
Kenya	S	162	63.3	94	36.7	256	1.85	NS
	US	137	51.3	130	48.7	267	0.19	NS
	Sub-T	299	57.2	224	42.8	523	1.5	NS
Total		655	54	558	46	1213		

Legend: S – Successful, US – Unsuccessful, Sub-T - Sub total, Effect. –Level of Effectiveness.

Table 42 shows that the matches won by Germany had more successful headings (52.5%) than where they lost (47.5%). The proportion of unsuccessful headings between matches won and lost by Germany is equal at 50%. Over all there were slightly more headings in matches won (51.2%) than lost (48.8%) by the national team of Germany.

The matches won by Argentina had more successful (51.7%) and unsuccessful (52.6%) headings compared to where they lost, 48.3% and 47.4%, respectively. Cumulatively, the matches won by Argentina had more (52.1%) headings than where she lost (47.9%).

The trend in matches involving Germany and Argentina is also reflected in those

involving Kenya. The matches won by Kenya had more successful (63.3%) and unsuccessful (51.3%) headings than where she lost, 36.7% and 48.7%, respectively. The headings in matches won by Kenya (57.2%) were more than where she lost (42.8%). However, the evidence in the differences was not enough to reject the null hypothesis that there was no significant difference in successful and unsuccessful headings between matches won and lost by Germany, Argentina and Kenya. It is interesting that the matches where Germany, Argentina and Kenya won had consistently more successful as well as unsuccessful headings.

### Free Kick

Table 43 shows the results of the successfully and unsuccessfully taken free kicks between won and lost matches involving Germany, Argentina and Kenya.

**Table 43: The difference in the effective execution of the free kicks by the winning and losing teams of Germany, Argentina and Kenya.**

Match	Effect	Won No.	%	Lost No.	%.	Total No.	t-value	Comments
Germany	S	93	45.6	111	54.4	204	1.25	NS
	US	19	52.8	17	47.2	36	0.21	NS
	Sub-T	112	46.7	128	53.3	240	0.28	NS
Argentina	S	106	54.6	88	45.4	194	1.05	NS
	US	29	48.3	31	51.7	60	0.27	NS
	Sub-T	135	53.1	119	46.9	254	0.36	NS
Kenya	S	40	43	53	57	93	1.04	NS
	US	49	59.8	33	40.2	82	1.9	NS
	Sub-T	89	50.9	86	49.1	175	0.18	NS
Total		336	50.2	333	49.8	669		

Table 43 shows that the matches where the national soccer team of Germany won had a fewer percentage (45.6%) of successful free kicks compared to where

she lost (54.4%). There were, however, more unsuccessful free kicks in matches won by Germany (52.8%) than where she lost (47.2%). The sub-total shows that there were fewer free kicks (46.7%) in won than lost matches (53.3%), by the team of Germany.

In matches involving Argentina, there were more successful free kicks in matches she won (54.6%) than where she lost (45.4%). In contrast, there were fewer unsuccessful free kicks in matches she won (48.3%) than lost (51.7%). Over all, the matches won by Argentina had slightly more free kicks than where she lost (46.9%). The trend of the free kicks in matches involving Kenya is similar to that of Germany but different from that of Argentina. Matches won by Kenya had fewer successful free kicks (43%), than where she lost (57%). However, there were more unsuccessfully taken free kicks in the matches she won (59.8%), than where she lost (40.2%). There were slightly more free kicks taken in matches won by Kenya (50.9%) than where she lost (49.1%).

Although there were slight differences in the proportion of successful and unsuccessful free kicks between matches won by Germany, Argentina and Kenya and the lost ones, the evidence was not enough to reject the null hypothesis that there was no significant difference in the successful and unsuccessful execution of free kicks between matches won and lost by the respective teams of Germany, Argentina and Kenya. The trend of the free kicks between matches

won and lost by Germany, Argentina and Kenya did not reveal any major differences.

### Goal Kick

The results of the successful and unsuccessful execution of the goal kick between the matches won and lost by Germany, Argentina and Kenya are shown in table 44.

**Table 44: The difference in the effective execution of the goal kicks by the winning and losing teams of Germany, Argentina and Kenya.**

Match	Effect	Won No.	%	Lost No.	%	Total	t-value	Comment
Germany	S	39	53.4	34	46.6	73	0.45	NS
	US	15	60	10	40	25	0.70	NS
	Sub-T	54	55.1	44	44.9	98	0.37	NS
Argentina	S	44	62.9	26	37.1	70	2.07	NS
	US	24	49	25	51	49	0.09	NS
	Sub-T	68	57.1	51	42.9	119	1.12	NS
Kenya	S	45	46.9	51	53.1	96	0.33	NS
	US	48	78.7	13	21.3	61	4.2*	Sign
	Sub-T	93	59.2	64	40.8	157	1.2	NS
Total		215	57.5	159	42.5	374		

\*P< .05, df=4, Critical value 2.776.

Table 44 shows that the matches won by Germany had more successfully executed goal kicks (53.4%) than in matches where she lost (46.6%). There were also more unsuccessful goal kicks in matches won by Germany (60%), than where she lost (40%). Over all, the matches won by Germany had more goal kicks (55.1%), than in those that she lost (44.9%).

The matches won by Argentina had more successful goal kicks in matches she won (62.9%) than where she lost (37.1%). The unsuccessful goal kicks were fewer in matches won by Argentina (49%), than where she lost (51%). Over-all, the matches won by Argentina, just like Germany had more goal kicks (57.1%), than where she lost (42.9%).

The pattern of goal kicks in matches involving Kenya show that there were fewer successful goal kicks in matches that she won (46.9%), than where she lost (53.1%). On the contrary, there were significantly more unsuccessful goal kicks in matches won by Kenya (78.7%) compared to where she lost (21.3%). The goal kicks in matches won by Kenya were therefore more (59.2%) than in lost ones (40.8%). However, apart from the significant difference in the unsuccessful goal kicks in matches won and lost by Kenya, the rest were not significant. Apart from the pattern shown by matches involving Kenya with regard to the unsuccessful goal kicks, the other matches revealed consistent practices irrespective of the outcome. The frequency of goal kicks appears to be more of a team character than a reflection of match outcome.

## **Tackle**

Table 45 shows the results of the successfully and unsuccessfully executed tackles between won and lost matches involving Germany, Argentina and Kenya.

**Table 45: The difference in the effective execution of the tackles by the winning and losing teams of Germany, Argentina and Kenya.**

Match	Effect	Won No.	%	Lost No.	%	Total	t-value	Comments
Germany	S	165	47.8	180	52.2	345	0.28	NS
	US	145	54.3	122	45.7	267	0.9	NS
	Sub-T	310	50.7	302	49.3	612	0.8	NS
Argentina	S	230	56	181	44	411	2.08	NS
	US	115	52	106	48	221	0.34	NS
	Sub-T	345	54.6	287	45.4	632	0.84	NS
Kenya	S	162	54.2	137	45.8	299	1.34	NS
	US	96	48	104	52	200	0.61	NS
	Sub-T	258	51.7	241	48.3	499	0.30	NS
Total		913	53	810	47	1743		

Table 45 shows that the matches where the national soccer team of Germany won had fewer (47.8%) successful tackles than where she lost (52.2%). There were however, more unsuccessful tackles in the matches won (54.3%) than lost (45.7%). There were slightly more tackles in matches won by Germany (50.7%) than where she lost (49.35). Argentina's matches revealed that there were more successful (56%) and unsuccessful (52%) tackles in matches she won than lost 44% and 48% respectively. Over all, there were more tackles in matches won by Argentina (54.6%); than where she lost (45.4%). The trend of the tackles in matches involving Kenya is slightly different from that exhibited by Germany and Argentina. Matches won by Kenya had more successful tackles (54.2%), than where she lost (45.8%). However, there were fewer unsuccessfully executed tackles in matches won (48%) by Kenya than where she lost (52%). There were slightly more tackles executed in matches won by Kenya (51.7%) than where she lost (48.3%).

Although there were slight differences in the proportion of successfully and unsuccessfully executed tackles between matches won and lost by Germany, Argentina and Kenya, the evidence was not sufficient to reject the null hypothesis that there was no significant difference in the successful and unsuccessful execution of tackles between matches won and lost by the respective national soccer teams of Germany, Argentina and Kenya. The trend in the matches won and lost is basically similar.

It is apparent that the technical and tactical trends in matches involving Germany, Argentina and Kenya are basically consistent between the won and lost matches. The teams demonstrated similar patterns of play irrespective of the outcome of a match. The only exception to this observation was the difference shown in matches involving Kenya on unsuccessful goal kicks and Germany on the unsuccessful corner kicks. Otherwise, matches reflected the different levels of mastery of the various techniques and tactics, but almost similar in terms of the proportion of success in won and lost games. This finding is consistent with the fact that each team develops and practices particular ways of executing the various technical and tactical variables. The approach to every match is basically the same with minor variations in terms of players and the type of opposition. But it is significant to note that won and lost matches for a team reflects similar technical and tactical trends.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1.0 INTRODUCTION

This chapter involves a summary of the findings, conclusions and recommendations to guide policy formulation and further research.

#### 5.2.1 SUMMARY OF THE FINDINGS

This study set out to: -

- (a) Identify the differences in the technical and tactical performance of the national soccer teams of Germany, Argentina and Kenya in international matches.
- (b) Identify the variables that characterise winning and losing teams of Germany, Argentina and Kenya in international matches.
- (c) Establish the level of accuracy of each of the technical and tactical variables in matches involving the national teams of Germany, Argentina and Kenya.

To guide the attainment of the objectives above, the following hypotheses were formulated and tested with the significance level for acceptance or rejection being set at  $P < 0.05$ .

The hypotheses formulated were that: -

1. There was no significant difference in the performance of the selected technical and tactical variables in matches involving Germany, Argentina and Kenya.
- II. There was no significant difference in the performance of winning and losing national teams of Germany, Argentina and Kenya on the selected variables.
- III. There was no significant difference in the successful and unsuccessful execution of the selected technical and tactical variables in matches involving the national teams of Germany, Argentina and Kenya.
- IV. There was no significant difference in the successful and unsuccessful performance of winning and losing teams in matches involving Germany, Argentina and Kenya on selected technical and tactical variables including:-
  - (a) Pass
  - (b) Corner kick
  - (c) Throw in
  - (d) Goal attempt
  - (e) Cross
  - (f) Heading
  - (g) Free Kick
  - (h) Goal Kick
  - (i) Tackle

## 5.2.2 MATCH ANALYSIS FINDINGS

The following is a summary of some of the findings of the study.

- a. There was no significant difference in the number of passes exchanged during matches by the national teams of Germany, Argentina and Kenya although the latter had less.
- b. There was no significant difference in the number of goals scored and conceded by the national teams of Germany, Argentina and Kenya although the latter scored and conceded fewer goals than both the former teams.
- c. There was a significant difference in the number of offsides with the German team having the lowest proportion, behind Argentina and Kenya.
- d. The German team had a significantly higher proportion of corner kicks compared to those of Argentina and Kenya.
- e. The Kenyan team had significantly more throw-ins when compared those of Germany and Argentina.
- f. There was no significant difference in the number of shots at goal between the different matches involving Germany, Argentina and Kenya, although the latter had the highest.
- g. Although the difference was not significant, the matches involving Kenya had more crosses when compared to Germany and Argentina.

- h. The headings in the matches involving the Germany, Argentina and Kenya teams were statistically different with the latter having the highest proportion.
- i. The number of free kicks taken in matches involving Germany, Argentina and Kenya were statistically different, with Argentina having the highest and Kenya the least.
- j. The difference in the number of goal kicks executed was statistically significant when Germany, Argentina and Kenya are compared with the latter having the highest proportion.
- k. There was no significant difference in the number of tackles executed in matches involving Argentina, Germany and Kenya, though the latter had the least.
- l. There was no significant difference in the number of attacks in matches involving Germany, Argentina and Kenya, although the latter had the highest proportion.
- m. The number of fouls and injuries in matches involving Germany, Argentina and Kenya were not statistically different though Kenya and Argentina had the least respectively.
- n. The number of cards shown (cautions and expulsions) in matches involving Germany, Argentina and Kenya was significantly different with Argentina having the highest and Kenya the lowest respectively.

- o. The frequency of substitution of players was basically similar in matches involving Germany, Argentina and Kenya.

**Regarding the winning and losing teams, the following were the findings:**

- a. That the winning teams of Germany, Argentina and Kenya had slightly more passes than the respective losing teams though the difference was not statistically significant.
- b. The matches won by Germany, Argentina and Kenya had slightly more offsides than where they lost. However, the difference was not statistically significant between winners and losers.
- c. Although the difference was not significant, the winners had slightly fewer corner kicks than the losers.
- d. Whereas the difference between the winning and losing Kenyan teams was significant in the execution of the throw-in, the case was not so for Germany and Argentina although losers had more throw-ins than the winners.
- e. For Kenyan matches, they had more throw-ins both in won and lost matches compared to the opponents.
- f. The differences in the shots at goal by the winning and losing teams of Germany, Argentina and Kenya were not statistically significant. However, the teams of Germany, Argentina and Kenya that won had slightly more shots than where they lost respectively.

- g. The Kenyan players crossed the ball significantly more in matches they won compared to where they lost. However, though not significant, the losing players of the German and Argentina teams crossed the ball more than those who won.
- h. The players of Germany, Argentina and Kenya headed the ball more in matches they won than where they lost. However, the difference was not statistically significant. A similar trend was found in the execution of the free kick.
- i. There were more goal kicks in matches won by Germany, Argentina and Kenya compared to those where they lost. However, Kenya had the highest proportion of the goal kicks. The difference between winners and losers was not significant. The difference in the execution of the tackles between winners and losers was also not significant.
- j. Comparatively, the players of Germany, Argentina and Kenya fouled more in matches they lost than where they won. But whereas the difference between the fouling rate of the winners and losers showed statistical significance in the German team, that of the others did not.
- k. The Kenya players, contrary to the German and Argentina ones, attacked significantly more in won than lost matches. German and Argentina players attacked more in matches where they lost compared to where they won, although the difference was not statistically significant.

**Regarding the effectiveness of the technical and tactical executions in matches involving the national teams of Germany, Argentina and Kenya, the following were the findings:**

- a. The difference in the successful execution of the throw-ins was not statistically significant, but that of the unsuccessful ones was between the matches involving Germany, Argentina and Kenya. Kenya's matches had a significantly higher number of unsuccessful throws compared to those in matches involving Germany and Argentina.
- b. The successful and unsuccessful shots at goal did not differ significantly among the matches involving Germany, Argentina and Kenya. However, the German matches had a higher success rate, whereas Kenya's had the highest unsuccessful shots.
- c. There were statistically significant differences in the execution of both successful and unsuccessful free kicks in the German, Argentina and Kenyan matches. Matches involving Kenya had the least proportion of successful free kicks but had the highest proportion of the unsuccessful ones.
- d. There was a statistically significant difference in the heading of the ball both successfully and unsuccessfully in matches involving Germany, Argentina and Kenya. Matches involving Kenya had the highest proportion of both successful and unsuccessful heading of the ball.

- e. The number of successful and unsuccessful crosses did not differ significantly among the German, Argentina and Kenyan matches. However, Kenya's matches had more unsuccessful crosses and the least successful ones.
- f. The execution of both the successful and unsuccessful goal kicks was significantly different. The Kenyan matches had a higher proportion of both successful and unsuccessful goal kicks compared to those of Germany and Argentina.
- g. The execution of the corner kick, be it successful or unsuccessful, did not differ significantly between the Kenyan, German and Argentina matches. However, Argentina and Germany's matches had a higher efficiency rate of the corner kick compared to those of Kenyan matches.
- h. All the teams showed maximum efficiency by converting all the penalty kicks awarded.
- i. The execution of both the successful and unsuccessful passes in matches involving Germany, Argentina and Kenya was significantly different. The matches involving Germany and Argentina were more efficient at passing compared to those for Kenya.
- j. The successful and unsuccessful tackles differed significantly in matches involving Germany, Argentina and Kenya. Efficiency wise, Argentina's matches were rated higher followed by Kenya's and Germany's.

### 5.3.0 CONCLUSIONS

Basing on the findings of the study, the following conclusions were made: -

- There was no significant difference in the number of passes exchanged, goals scored, shots at goal, crosses, tackles, attacks, fouls and injuries sustained during matches involving the national teams of Germany, Argentina and Kenya. These features were therefore relatively similar in the different matches.
- There was a significant difference in the number of off sides, corner kicks, Throw-ins, heading, free kicks, goal kicks and cards shown during matches involving Germany, Argentina and Kenya. These teams displayed both defensive and offensive differences pertaining to the execution of offside play, corner-kick, throw-in, heading, free kick, goal kick and disciplinary record.
- The winning teams were characterised by better ball possession, use of the off side trap, had fewer corner kicks, had more shots at goal, headed the ball more and had more goal kicks. However, the losing teams of Germany, Argentina and Kenya tended to cross the ball more, had more throw-ins and fouled more. The German and Argentine players also attacked more when they were losing than winning while the reverse applied for Kenya.
- Kenya's matches had the highest proportion of unsuccessful throw-ins, shots at goal, free kicks, heading, crosses, goal kicks, corner kicks and passes. The

high rate of unsuccessful technical and tactical execution reflects a poor mastery of the playing technique of the players of the Kenyan team.

- It is clear that there is little difference in the way team plays when winning compared to when losing. However, such a minor difference can make a major difference in the outcome of a match.
- Each of the countries of Germany, Argentina and Kenya have technical and tactical characteristics that are unique to each though some apply equally to all. For example, Argentina featured prominently on the high number of passes, fouls, poor disciplinary record and tackles. Germany displayed a more aggressive offense, successful corner kicks, successful shots and efficient passing.
- Soccer matches, irrespective of the level of play, can be compared favorably using a match analysis chart. The differences and similarities in matches reflect the dynamic nature as well as the globalization of the sport.

#### **5.4.0 RECOMMENDATIONS**

Recommendations made as a result of this study have implications for sports policy and further research.

#### **5.4.1 POLICY AND PRACTICE**

From the findings of this study, it is recommended that: -

- a. The Department of Sport and the Kenya Football Federation should take steps to strengthen the research component in the coaching of the national team.

- b. The Department of Physical Education at Kenyatta University being the only centre for training higher level manpower in sport should lay emphasis on applied researches in the area of sport especially soccer.
- c. The Government of Kenya should formulate a sports policy to spell out the role and practice of research in the enhancement of national and international sports programmes with special reference to soccer.
- d. An early introduction of footballing skills should be introduced to the youth of the country in order to improve on the technical and tactical requirements of the game.

#### **5.4.2 FURTHER RESEARCH**

It is suggested that further research be carried out to:

- a. Comparatively analyse the soccer matches in Africa with a view of establishing any technical and tactical differences and similarities between the different geographical regions.
- b. Establish the key technical and tactical features of the national premier league to improve national coaching and training programmes.
- c. Establish the extent to which video assisted as well as manual match analyses are utilized to improve on performance by coaches and ensure that players get the appropriate feedback regarding performance.

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## APPENDICES

### APPENDIX A: MATCH ANALYSIS CHART

VARIABLES	TEAM A	TEAM B
Throw-in - Successful		
Goal Attempts - Successful		
Corner Kicks - Successful		
Crosses - Successful		
Headers - Successful		
Free Kicks - Successful		
Goal Kicks - Successful		
Passes - Successful		
Penalties - Successful		
Tackles - Successful		
Preferred Attack Side - Left		
Goal (Number)		
Offside (Number)		
Injury (Number)		
Cards (Number)		
Substitutions (Number)		
Fouls (Number)		
Remarks		

**APPENDIX B: LIST OF OBSERVED MATCHES**

TEAMS	YEAR	OUTCOME
GERMANY VS HOLLAND	1990	WON
GERMANY VS BULGARIA	1989	WON
GERMANY VS CHESLOVAKIA	1990	WON
GERMANY VS HOLLAND	1992	LOST
GERMANY VS DENMARK	1992	LOST
GERMANY VS HOLLAND	1988	LOST
GERMANY VS SPAIN	1994	DREW
HOLLAND VS HOLLAND	1989	DREW
GERMANY VS ITALY	1988	DREW
ARGENTINA VS ITALY	1990	DREW
ARGENTINA VS BULGARIA	1994	LOST
ARGENTINA VS BRAZIL	1995	DREW
ARGENTINA VS ROMANIA	1994	LOST
ARGENTINA VS GREECE	1994	WON
ARGENTINA VS NIGERIA	1994	WON
ARGENTINA VS YUGOSLAVIA	1990	DREW
ARGENTINA VS GERMANY	1990	LOST
ARGENTINA VS BRAZIL	1990	WON
KENYA VS LIBERIA	1989	WON
KENYA VS ERITREA	1994	WON
KENYA VS ALGERIA	1996	WON
KENYA VS ZAMBI	1990	LOST
KENYA VS SENEGAL	1992	LOST
KENYA VS CAMEROUN	1990	LOST
KENYA VS MALAWI	1989	DREW
KENYA VS EGYPT	1989	DREW
Kenya VS SENEGAL	1990	DREW

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