

## Mau Mau War, Female Circumcision and Social-Cultural Identity among the Agikuyu of Kiambu, Kenya

Martha Wanjiru Muraya (Corresponding author) Department of Arts and Humanities, Chuka University P.O Box 109-60400, Chuka, Kenya Tel: 254-723-628-518 E-mail: murayamartha@yahoo.com

 Received: June 13, 2015
 Accepted: June 23, 2015
 Published: November 24, 2015

 doi:10.5296/ijch.v2i2.8619
 URL: http://dx.doi.org/10.5296/ijch.v2i2.8619

## Abstract

This paper generates qualitative information on how the Mau Mau war transformed the Agikuyu female circumcision and its implications on women's roles, value and gender relations among the Agikuyu in Kiambu. The Agikuyu people of Kiambu believed that, in the traditional set up, female circumcision defined gender roles and women's power to negotiate space with men. During the Mau Mau war, the practice experienced a considerable changes but it persisted with minimal training and ceremonies. The paper uses a descriptive research design which gives a narrative description of the state of affairs as it exists. The source of information is mainly Oral interviews, Archival information, and cross-checked information from written documents. The transformation that took place in the Agikuyu female circumcision rite during the Mau Mau war is analysed within the concept of gender which gives the study a comprehensive relational platform through which gender roles and relations are interrogated. The study concludes that the persistence of the practice during the Mau Mau war was due to deeply rooted cultural identification, and the need for the Agikuyu women and men to negotiate social space and relations. It is evident in this study that during the Mau Mau war the Agikuyu men and women feared to be victimized and to be rejected by the society and therefore they practiced female circumcision for social-cultural approval and affirmation. Also the practice assisted men to preserve their superior values and dominance role during the period of political uprising.

Keywords: History, Mau Mau, Female Circumcision, Gender roles and relations, Culture



## 1. Introduction

Much as the European "civilizing" mission impacted on African culture, the latter persisted and retained some indigenous features, while at the same time giving in to certain influences from the West. This paper examines the indigenous Agikuyu custom of female circumcision, which was a core transitional practice that was believed to transform young girls to socially acceptable adults with new roles, values, and gender relations. During the Mau Mau war the practice experienced a considerable transformation, which is believed to have had a significant impact on gender roles, values, and relations.

Circumcision is an initiation rite deeply embedded in social psychology, cultural symbolism, values, and norms of the society in question. It is in fact a crucial social-cultural and a religious practice which has a complex meaning that affects the entire society. At its most basic level, circumcision marks a symbolic transition from childhood into adulthood. In many African societies, the act symbolizes a person's assumption of new socially constructed roles and responsibilities, status and gender relations.

A number of discourses on circumcision show that the practice originated thousands of years in antiquity (Lightfoot, 1990 Assaad, 1980). In ancient Egypt, Sudan and Ethiopia, the procedures of this custom were depicted in the pyramid carvings; cave drawings, temple drawings, and paintings (Assaad, 1980). These ancient societies practiced circumcision as a physical mark in the process of socialization. However, the practice differs in procedure and significance from one community to another.

Whereas circumcision is a predominantly male ritual, various communities in the world conduct the operation on the female gender group. They remove a part or parts of the female genital organ as an analogy to male circumcision. Traditionally it was done to symbolically shape the identity, status, roles, and responsibilities of a woman. This study uses the term female circumcision as an appropriate term that was used in the Agikuyu traditional setup.

During the decolonization period in Kenya the freedom fighters were among other things agitating for the regeneration of their cultural values which they believed had been lost during their interaction with the European colonialists. Although Mau Mau war was not fundamentally Agikuyu movement as is so often assumed, it is clear that since the majority of the members were Embu, Meru and Kikuyu, they made a strong appeal to the renewal of the Agikuyu traditional values and customs (Paul Ndirangu Karinga O.I, 5/12/13). Mau Mau fighters mainly wanted to regain cultural freedom and recover their alienated land.

The different explanation on the origin of the Mau Mau movement suggests that no one seems to know precisely when, how, why, who and where the movement started. European scholars like Frost (1978: 141) and others view Mau Mau as a civil war that was not only against European but anyone else who stood between the Mau Mau fighters and the regaining of their lost freedom. They also saw the movement as planted and supported from outside especially by both Indians and Russians (Leigh, 1954:17). The Europeans alleged that Fred Kubai, the then president of East African Trade Union, together with a young Indian communist, Makhan Singh, was spreading inflammatory propaganda against European



capitalist (Leigh, 1954:18, Throup, 1988). However, Barnett and Njama (1966:114) view the movement as simply a tension or a contradiction of ideologies such as secular versus religious, tribal versus national or old versus new. This Eurocentric perception of the Mau Mau movement gives an impression that the fighters practiced tribalism and traditionalists and were not ready to accept change.

Other explanations views Mau Mau as identical with the outlawed KCA (Kikuyu Central Association) movement. The argument was that after the Association was banned in early 1940s, it continued underground and was referred to as an association of three initials (*Kiama kia ndemwa Ithatu*)(Ngumo Muraya, O.I ,7/11/2013). The three initials were "Mau" meaning those things they discussed in secret. At the ethnic level, it is believed that the Mau Mau movement was fighting for the cultural renewal. According to Kinyati (1977:287), Mua Mau largely arose from the shock of drastic change in Agikuyu traditional way of life. He argues that in the face of colonialism, the Agikuyu cultural identities, traditional systems, norms, and values had been greatly interfered with. Thus, the Mau Mau movement was an outlet of the amounting frustrations, bitterness, and anxiety. Kinyati looks at it as a desperate move by the Africans especially the Agikuyu to revert to their pre-colonial cultural practices.

The social- cultural interests of Mau Mau participants has been clearly demonstrated by the involved in singing Mau Mau Agikuyu patriotic songs known as *Muthirigu*. These songs were sung by the Mau Mau fighters and clearly reflected Mau Mau's obsession with the alienated land and cultural freedom (Maloba, 1993). Particularly, the *Muthirigu* song was meant to condemn the supporters of Christian ideologies and adherents especially the uncircumcised girls. The song ridiculously reflected the frustrations and emotions of the Agikuyu people with regard to the abolition of aspects of their culture, land alienation, and government oppression" (Rahab, O.I, 11/11.13).

Roseburg and Nottingham (1966) agree with the informants that Harry Thuku one of the nominated African leaders in the Legislative council from 1944 was also being glorified in *Muthirigu* song as the 'King of the Agikuyu'. Through the *Muthirigu* songs and dances, the Mau Mau fighters articulated their opposition to the ban of female circumcision. The young Agikuyu men who were in the forest were a powerful source of political anxiety during the1950s (KNA PC/CP/8/7/1/22, 1956).

Therefore, it is appropriate to say that Mau Mau was an amorphous movement that symbolized the political, social-cultural, and economic interests of the participants (Kershaw, 1972:205). Nevertheless, despite its shrouded origin and meaning, one thing is certain, that the movement arose from an increased anxiety, anger and uncertainty caused by conflicting ideas and perception between the indigenous people and the colonialists. According Josphat Kariuki, O.I, 22/11/2013), the members of Mau Mau movement were in favor of a new culture based on the Agikuyu custom but not necessarily in its original form.

The colonial regime tried to devalue indigenous culture for their economic motives. This implied that the indigenous social institutions, patterns, and attitudes were going to be affected adversely. In particular, during the Mau Mau war, the Agikuyu practice of circumcision which the community previously looked to for holistic education, gender



identification and power relationship was seriously crippled. Women significantly lost their space for negotiation with men and consequently the traditional division of labour by gender was compromised. Thus, the Agikuyu women found themselves in a dilemma that kept the socio-political and economic powers primarily in the hands of men.

Given this lacuna, this research paper focuses on the rite how the cultural rite of female circumcision among the Agikuyu people was transformation during the Mau Mau war and the impact it had on the gender roles and relations.

## 2. Literature Review

Female circumcision in general has been widely studied worldwide. There is a lot of literature that has been written specifically on female circumcision among the Agikuyu people. This paper reviews various relevant literature of female circumcision in an attempt to shed more light on how the Mau Mau war transformed this rite of passage and its impact on its role in the construction of social-cultural identity among the Agikuyu of Kiambu County in Kenya.

Kenyatta (1938) and Leakey (1977) describe the importance of the pre-colonial Agikuyu customs, traditions, and socio-cultural practices. They state that the Agikuyu socio-cultural practice of circumcision (*irua*) was a very important custom because it marked the boundary between childhood and adulthood and was accompanied by enormous educational, social, moral, and religious lessons quite apart from the operation itself. These works provide the basis of understanding the values of traditional social-cultural practice of female circumcision among the Agikuyu people.

Lambert (1956) and Cavicchi (1977) give a general evaluation of the structure and organization of Agikuyu community. They note that circumcision created the social separation between the circumcised and uncircumcised within the Agikuyu traditional society. To them, the circumcised individuals were considered to have attained human dignity while the uninitiated were not considered as having full 'human' dignity. They were referred to as 'kihii' uncircumcised male and 'kirigu' uncircumcised female. Hobley (1922) similarly reveals that the Agikuyu circumcision was believed to have a religious connotation in the sense that it was conducted to please gods. Hoblely connects "Thahu" a curse with circumcision and argues that circumcision prohibitions were to be observed, failure to which the society could receive a curse from the gods. Similarly, Kamuyu wa Kangethe (1981) and Githige (1982) contend that after circumcision, the initiate qualifies to participate in the hierarchical structure of the Agikuyu. These works are very significant in this study because they explain how circumcision was used to create gender disparities in the Agikuyu society. However, this paper goes a step further to investigate the extent to which the traditional role of circumcision in construction of social identity was changed during the Mau Mau war.

Various scholars use different perspectives to examine the African cultural encounter with colonialism. They argue European interactions and penetration in Kikuyu land disregarded the indigenous economic, political and social-cultural practices. Cora's (1993, 1998) works adopt a feminist approach in analyzing the Agikuyu customs. She indicates that the custom of female circumcision was traditionally used to oppress women and to restrain their sexuality.



To her, the introduction of colonial policies in Kikuyu land impacted negatively on women's values and status. Through their participation in labor activism, and cultural nationalism, their traditional roles and status were impacted on. Likewise, Sandgren (1976) observes that female circumcision was a central religious activity of Agikuyu, however she explains that the European missionaries had a contrasting view on this cultural practice. According to her, the missionaries saw female circumcision as unhealthy, unnatural and incompatible with Christian morals. This triggered a controversy and misunderstanding between the Agikuyu people and the Europeans.

Clayton et al (1974) give an anthropological analysis to the nature and impact of colonial policies on the traditional societies in Kenya. They stress the need to study the colonial labor policies, the experience of African in the reserves and the problem they faced under the colonial rule. However, they do not give details of how the colonial labor policies interfered with the rite of the Agikuyu cultural practices and how division of labor by gender was done during the Mau Mau war. This study will be more specific because it looks at how the this practice was affected by the Mau Mau war.

Ethnographic authors such as Ngugi (1965) Nottingham and Roseburg (1966) Dilley (1966) and Arnold (1974), discuss the impact of colonialism on the African cultural practices in general. They argue that African culture was colonized and moderated by the agents of Europeans such as the Christian missionaries who were actively helped to suppress African customs and cultures such as female circumcision. These agents imposed on the Africans the European values and customs. They also condemned the practice as immoral, health hazards and archaic. The writers also describe the manner in which the indigenous Agikuyu people readjusted themselves to the British colonial systems.

Further, Kanogo (1993) points out that the continued migration of the Agikuyu to the Rift valley before and during the Mau Mau war interrupted the Agikuyu cultural practices. The Agikuyu people transferred their cultural practices in to the re-settlement areas where the practices experienced considerable changes. However, she does not actually discuss the specific changes that took place in this specific cultural rite of female circumcision.

## 2.1 Theoretical Framework

This paper uses the concept of gender as a tool of analysis to interrogate changes that occurred in female circumcision among the Agikuyu during the Mau Mau war. This is a more inclusive relational concept, which is the most appropriate in examining change in women roles, status, and gender relations.

Kelly- Gadol (1984: 10) defines gender as a social relation of sexes (men and women). According to her, gender is usually asymmetrical division of power relations, which favors men and constrains women. However, it should be noted that not all gender relations favor men and constrain women. In addition, Mbilinyi (1996) views gender as a concept that is used to distinguish culture from biology. According to her, masculinity and femininity are not given by biological nature, but are socially constructed reality whose maintenance and practices manifest in the individual's identity in the society. Indeed, the differences in values



and behavior assigned to women and men are embodied in gender roles. Yet, it seems that in most cases, the biological differences between men and women are in most cases used to form the basis for social constructions of identities. This means that the connection between gender and sex seems all the more a fact of nature rather than as a result of social construction. Further, Moore (1988) describes gender as a phenomenon that permeates various social conditions such as race, age, religion, class, and ethnic identities. This means that the designation of a man or a woman changes from one group to another depending on the above- mentioned social conditions.

Female circumcision should therefore be understood in this context. It should be conceptualized as a symbolic rite of passage that culturally constructs women roles, values and gender relations, which goes beyond the physical cutting of women's genitals. This paper considers the Agikuyu female circumcision as a tradition that functioned as a rite of passage for girls from childhood to adulthood. It was an initiation practice, which had an ultimate aim of imparting knowledge of the expected adult gender roles, of expected manners and gender relations. Gender relations in this case are the ways in which social categories of men and women or male and female relate, share power, and participate in the whole range of social organization, activities and in sexual behaviors.

Consequently, the gender hierarchical image that was created through circumcision also fashioned the society's perception of male and female roles, values and relations. This paper argues that the traditional meaning and purpose of female circumcision rite such as instilling new roles, values, and gender relations to the initiates has not been static. It has been moderated and redefined as the community interacted with the foreigners particularly the Europeans and the Africans reaction to the European modernization through the Mau Mau war. Thus, this paper identifies the transformation of female circumcision during the Mau Mau war in a platform of social construction of identity.

## 3. Research Methodology

## 3.1 Research Locale

This research was carried out in the Southern part of Kikuyu land that is, South of Chania River (initially referred to as Southern Kikuyu land in the colonial days) or Kiambu District. According to the Kiambu County Integrated Development Plan (2013-2017), Kiambu County is located in Central Kenya and it comprises of 12 constituencies namely: Lari, Juja, Ruiru, Kikuyu, Limuru, Kabete, Kiambaa, Githunguri, Thika Town, Kiambu Town, Gatundu North, Gatundu South. The area lies between latitudes of 0°75" and 1°20"south of the Equator and longitudes 36° 54" and 36°85" East (Kiambu District Development Plan, 2004). Rainfall in the area is reliable and favorable for agricultural activities. The rainfall pattern is bimodal with the long rains falling between April and May followed by a cool season during July and August, which culminates into the short rains between October and November. According to the 2009 Kenya Population and Housing Census, Kiambu County population for 2012 was projected to be 1,766,058 with 873,200 males and 892,857 females. The area is divided into four broad topographical regions; Upper Highlands, Upper Midlands, Lower Highland and Lower Midlands. Upper Highland is found in Lari and Githunguri divisions that lie at an



altitude of 1,800 metres. Lower Highland is mostly found in Limuru, Kikuyu and Kiambaa divisions that lie below 1,500 metres above sea level (see pg 12).

## 3.2 Research Design

The research will use descriptive research design which is based on historiography, and historical explanation. Specifically, the study will use a descriptive case study of Kiambu County to give precise descriptive analysis of the situation

## 3.3 Sampling Procedures

Given the complexity and the expansiveness of this proposed area, it was necessary to narrow down the research locale into a manageable research area. The researcher therefore randomly sample four constituencies and then selected two locations from the sampled constituencies using a sampling table. Stratified sampling procedures will be used to choose respondents age bracket strata of 40-70 years, 70-105 years and the men and women strata category. They were identified using the snowball and purposive sampling technique. The researcher interviewed a higher ratio of elderly people because they were in a better position to provide appropriate information with regard to the lives of the Agikuyu people

## 3.4 Data Collection Procedures

Data for this research was obtained from different sources using different methods. Both primary and secondary data were gathered to inform. The primary data included the archival and oral information. Since archival documents may have weaknesses due to their bias, subjectivity of the producer, the researcher corroborated them with other primary and secondary data. Oral interviews were also conducted. These comprised a crucial source of primary data. An interview guide was used to interview both female and male residents of the area in line with the objectives of the research.

## 3.5 Data Analysis and Interpretation

The researcher undertook a qualitative data analyses through historical explanation and thematic analysis. This involved a rational historical criticism, data evaluation, data contextualization and colligation of the events in descriptive and systematic manner. The researcher engaged in an exhaustive and exhausting review of all the information that was conceivably necessary. The recorded interview (in Kikuyu language) was transcribed and translated into English. It was also compared with other sources of information in order to verify their validity and finally the data from various sources was corroborated chronologically. Data was then interpreted within the Bem's concept of Gender. This helped to conceptualize the information within this framework

## 4. Findings and Discussions

## 4.1 The Mau Mau Oath-Taking and Agikuyu Female Circumcision

The Mau Mau leaders fully used the fear underlying the Agikuyu traditional oath ceremony to achieve their political objective. The first recorded use of the oath for modern political purposes in Kenya was the oath taken by members of Kikuyu Association in 1920 (Githige,



1978). This was a simple oath binding the members not to sell their land to European or Indians and was taken holding soil in one hand and the Bible in the other (KNA/GO/3/2/74, Vol ii, 1968). However, it should be noted that the Agikuyu, like other tribes, had many different traditional forms of oath ceremonies that they took very seriously. The process of recruiting the Mau Mau members involved the taking of oath of unity, which was an elaborate initiation ceremony that united all members of the movement (Leakey, 1952; Carother, 1955; Ng'ang'a, 1977).

The ceremony incorporated a synthesis of modern of Christian features such as the Cross, the traditional oaths features, and taboos (Ndegwa Muita O.I, /8/11/13). It also contained modern political objectives that contained vows to fight for land and freedom (Barnett and Njama, 1966). Informants described features of the oath particularly those that involved sexual symbolism as horrible. In particular, Margaret Njeri (O.I, /0/11/13) and Ndegwa Muita (O.I, /8/11/13) observe that the Mau Mau used women's menstrual blood and public intercourse with sheep and young women during the oath taking. Although these claims are doubtful because there were very few women who were in the forest during the Mau Mau war, they could give an insight of how the Mau Mau fighters were acting out of anger and they were capable of doing scary things. Furthermore, the Native Affairs General Policy also reveals that the Mau Mau used the women's under clothes in order to illustrate disgust and annovance (PC/CP/6/4/6/ 1952). According to the written documents by Barnett and Njama (1966: 119) and Kenyatta (1953: 273-279), "the blood that was used by Mau Mau rebels in the forest was goat's blood that was slaughtered specifically for the ceremony". However, if we take the informants revelations and the archival information that suggests that female private items were being used in Mau Mau Oath as factual, this was a real repugnant to the Agikuyu traditional norms and values. It meant that Mau Mau war adversely impacted on the Agikuvu traditional values and norms.

In the traditional Agikuyu setup it was a taboo to even think of women's inner garments being used in a traditional religious ceremony like oath taking. The Agikuyu people were traditionally very puritanical regarding this biological process. They had sexual taboos, regulations, and expectations that were instilled in the individuals during the initiation rite of circumcision (PC/CP/6/4/6/ 1952). It was believed that the breaking of these rules could bring disgrace not only to the victim but also to the whole initiated group. Hence, the sexual symbols used during swearing of an oath were a sign of violation the traditional instructions that were given to the initiates during circumcision ceremonies. During the Mau Mau war, emphasis on the traditional training during the circumcision rite on gender roles and values was rarely adhered to (Ndegwa Muita, O.I 6/11/13)

Since Mau Mau oath involved people from almost all age groups, Agikuyu circumcision became the main factor in administering the oath (Jecinta Waithera, O.I, 28/11/2013). For an individual to be permitted to take the oath of Mau Mau movement he or she ought to have been circumcised. The Agikuyu believed that an uncircumcised person could not keep secrets. Thus, the Agikuyu proverb that goes; *"muici na kihii akenaga kia rua"* meaning that the one who steals with the uncircumcised boy will be reassured of secrecy the day the boy will be circumcised or die (Ruth Mwangi, O.I 6/11/13). The same perception was with the Mau Mau



fighters. Hence, the first step during the oath taking was to pass through an arch of sugar cane stems and banana leaves naked for a thorough check up on whether one was circumcised (Githige, 1978).

It is argued that the oath was a concoction of almost unimaginable ingredients. Barnett and Njama (1966:133) note that the oath was horrible, though typical like the traditional Agikuyu oath. It was a mixture of goat's blood, dung from the intestines of a cow or a goat, and water. There were other animal products such as milk, fat and blood and intestines, goats' eyes, and a mixture of lion and leopard fat. The ceremony that took almost a day in deep parts of the forest had effects that were overwhelming. The oath was supposed to cleanse away all self-consciousness under all circumstances. The effects ranged from mutilation of bodies, drinking of human blood, eating petrified flesh, rapping pregnant women apart, and slashing of the babies in front of their mothers. The rebels also raped women using bottles. This was especially the case in Lari massacre of March 1953(KNA CCK/R11/7/6, 1952-1954, Waringa Wagenia, O.I 4/11/13).

However, it should be noted that these cases were not typical Mau Mau behaviour in general, not all the Mau Mau fighters were bloodthirsty killers. According to the majority of the respondents, some unfocused young and less educated men in the forest conducted such subversive activities and killings (Gathoni Mbugua, O.I, 4/11/2013 Githige, 1978).

The oath itself emphasized against disclosure of the Mau Mau undertakings to the government or any European and the sale of land to any European (Carother, 1955:15). During 1950s, the administration of Mau Mau oaths increased significantly. Beer drinking ceremonies, the Independent Schools and Churches became meeting points for oath administration and dissemination of nationalistic sentiments (Elizabeth Wanjiru, O.I, 25/11/2013). All the District Commissioners in Kiambu and Naivasha reported an increased forced oath and intimidation especially on women. This is what brought Mau Mau to the public, following complaints by unwilling recipients of the oath (KNA DC/KBU/ADM 2/2/81-16,1953).The movement was then declared unlawful.

The Mau Mau oath taking was soon faced with a fundamental dilemma. It proved difficult for the non-Agikuyu fighters in the Mau Mau to recognize themselves in the mirror of Mau Mau as its oath symbols and values were mainly Agikuyu. In particular, the communities that did not practice circumcision as their cultural custom found the idea of oath unappealing to them (Barnett and Njama 1966:122).

# 4.2 Female Circumcision during the State of Emergency and Impact on Gender Roles and Relations

Thus, between 1952 and 1956 the Mau Mau intensified the practice of the Agikuyu traditional ritual (KNA DC/KBU/I/6, 1953). The main reason for this was that the declaration of the State of emergency had pushed the movement into a position of extreme isolation in the forest. The only visible aspects of Mau Mau fighters were its subversive activities in form of guerrilla war, scorched-earth policy, massive killing of those who did not abide by their commands.



In Kiambu, the situation deteriorated rapidly after the declaration of the State of Emergency in May 1952. Mass assassination and anxiety had already begun in most of the Agikuyu reserves. Those who refused to take the Mau Mau oath were threatened and subjected to ruthless physical violence (Githige, 1978). By 1952, most of the Mau Mau fighters had established close links with the revolutionary political leaders and trade unionists. The group organized strikes, guerrilla strategies, and physical intimidation against the Europeans and their supporters. Mutilated bodies of Africans and some of the Europeans were discovered in various parts of Kikuyuland.

According to Carothers (1955:26), the police report indicated that between May and October 1952, at least 40 people had been brutally murdered. Majority of them were loyalists to the Europeans and those who witnessed against Mau Mau members. African chiefs and government soldiers were ruthlessly killed. Animals in the European farms were maimed, brutally slashed and others beaten with nail studded sticks. Gangs of men and women walked from one village to the other singing the abusive *Muthirigu* dances and songs. The climax was the assassination of one of the colonial loyalists the senior Chief Waruhiu (Roseburg and Nottingham, 1966).

The Mau Mau fighters were very strict with regard to the issue of Agikuyu Female circumcision. They demanded that the Christian adherents must declare their stand on the issue of female circumcision. They ordered them to state if they were Agikuyu *(Karing'a)* meaning pure or Europeans in black skin (Frost, 1978:148). Those who refused to declare their stand were brutally murdered and their daughters circumcised by force (Joseph Mwaura, O.I 13/11/13). The Christian adherents were strongly opposed to the Mau Mau subversive activities and saw it as violation of their Christian beliefs and violence against female sexuality. The Europeans did not see any rational justification behind the practice of female circumcision and they therefore opted to circumcise their girls out of fear of condemnation and intimidation by the Mau Mau rebels.

Following the declaration of the State of Emergency in December 1952, Mr. Saga, the then District Officer Githunguri, sent a circular to all Chiefs in Kiambu. The letter instructed the Chiefs to notify all locals that no circumcision ceremonies would be held in areas that were believed to be Mau Mau strongholds. The reason was that the ceremonies could be used as channels of oath administration and organizing other subversive activities. He therefore recommended that if such ceremonies must be conducted, they should take place during daytime for security purposes (KNA PC/6 /4/2/ 1952). In addition, each circumcision ceremony should be conducted in the presence of a reliable government officer to ensure that no criminal activities occurred during the ceremonies. Besides, the ceremony was supposed to take the shortest time possible, meaning that no time was set aside for the psychological preparation and instruction on expected gender roles, values and relations. Therefore circumcision was slowly being reduced to physical cut only without much celebration (Koinange Njeria, O.I, 22/ 11/2013).

According to Chief Kamau Mwai of Ndumberi in Kiambu, from this time onward circumcision was only going to be allowed every end of the year in order to stop interrupting



the school programs in the reserves (KNA PC/CP 1/4/4, 1955). Consequently, in November 1955 the Kiambu District officers prepared a timetable indicating the dates of circumcision ceremonies to be held in the month of December 1955.

Limuru	12 <sup>th</sup> Dec and 15 <sup>th</sup> Dec
Ndeiya	18 <sup>th</sup> Dec and 19 <sup>th</sup> Dec
Lari	10 <sup>th</sup> Dec and 17 <sup>th</sup> Dec
Ngecha	17 <sup>th</sup> Dec and 19 <sup>th</sup> Dec
Dagoretti	11 <sup>th</sup> Dec and 16 <sup>th</sup> Dec

Table 1. Circumcision timetable of 1955

Source: KNA PC/6 /4/2/ 1955, Native Affairs General Policy, file.

The above circumcision timetable had a lot of implications on this cultural practice and its subsequent ceremonies. Circumcision ceremonies, which traditionally took almost six months, were now reduced to a process of less than one month only. The confining of circumcision to particular dates demystified the indigenous female circumcision as a code to be obeyed without wavering. It also implied that there was very minimal closeness, training and interaction between the initiates and their parents, grandparents and sponsors, who prepared them for the circumcision (KNA CCK/R 11/7/6,1952).

Indeed, very little instruction on gender power relations, roles, and sexuality was given to the Agikuyu initiates to shape their interpersonal relationship. The little that was learnt could not be put in to practice immediately because of political instability, school attendance, communal work and working on European settlers farms (KNA PC/6 /4/2/ 1952). Lack of proper guidance led to negligence of the traditional function of circumcision in shaping gender roles, values and relationship.

Apparently, with the absence of the extensive circumcision preparation and character training, young circumcised girls became very irresponsible. As Peter Gateru from Limuru observed,

"Those who were circumcised during the State of Emergency were not given extensive instructions on the expected roles, values, and relations. Majority of them went through a hurried operation since there was no time set aside for the rite, and ceremonies were prohibited" (O .I, 3/11/2013).

Lack of attention and proper character training during this rite of passage had far reaching consequences on the initiates. Over fifty percent of the informants related this increase to lack of thorough preparations, instruction on sexuality, and age group system values during circumcision to the increased cases of young men and women indulging in sexual intercourse became increasingly alarming (Njori Wamagara, O.I, 28/ 11/2013).



Given this scenario it was reported that by 1957 a considerable number of girls did not know how relate with the opposite sex and other social skills and therefore they were tempted to engage in irresponsible pre-marital sexual relations (Josphat Kariuki, O.I, 22/11/2013). Evidence shows that the post Mau Mau war period registered an increased number of unwanted pregnancies and children born out of wedlock in Kiambu District (Thompson, 1985). Such trends prevented girls from attending Schools and from participating in economic activities that would improve their social status as women.

During the State of emergency, government also introduced a special tax on circumcision to combat the cost of government expenditure caused by the increased Mau Mau hostilities. In the Minutes of the Local Native Council 13/52, it was recommended that boys' circumcision to be charged six shillings and girls five shillings per an individual person. The colonial government thought that by imposing a higher circumcision fee, circumcision ceremonies would reduce or be controlled (KNA CCK/R 11/7/6,1952). In 1951 a Circumcision By-Law that was passed by the government emphasized that no person could circumcise a male or female unless with their consent or approval from either the parent or a lawful guardian. Under these circumstances, circumcision became very expensive, far beyond the local people's reach, given that majority were living under impoverished conditions in the villages and in reserves. Only a few who could afford to pay such amount, a good number of people were forced by the circumstances to conduct both male and female circumcision secretly with a concealed circumciser in order to avoid the circumcision payments (Jecinta Waithera, O.I, 28/11/2013). Consequently, the publicity and material wealth associated with the Agikuyu circumcision decreased considerably during the Mau Mau war.

Some Mau Mau rebels and home guards forcefully circumcised the girls from Christian families who had reached the initiation age. Those who were supporters of Mau Mau continued to circumcise their girls secretly in the bushes and deep forests. The operation at this time was done more crudely and severely than before as a sign of protest and disapproval of colonial rules. Rahab Wanjiru Mungai (O.I, 21/11/13) observed that some destructive Mau Mau fighters and home guards mercilessly mutilated some women as a sign of protest. She pointed out that one of the Mau Mau rebels in Ndeiya circumcised his Christian relative's girl. Although majority of the Mau Mau fighters observed the oath's restriction that prohibited them such acts, this single case was contrary to the traditional setup where men circumcising women was unheard of.

The scenario during the State of Emergency demonstrates a gender power relation that privileged men and undermined the value of the Agikuyu women. The situation created a context within which the Agikuyu women and men defied the ban on circumcision, and circumcisers went on to cut a large part of genitals as an act of resistance. Some Mau Mau and home-guards men took the advantage of the situation and used their male chauvinistic reasons to express their displeasure (KNA PC/CP/8/7/6:1950-53). They sought to be involved in female circumcision as a way of pushing their male dominated political movement and plans. Furthermore, even in the1950s most Agikuyu men who were well educated could not marry uncircumcised girl, Njoki Wamagara (O.I, 28/11/2013). Thus, the European colonial ban and restrictions on female circumcision in Kiambu could have been successful to a larger



extent but was hindered by the resistance from male egocentric attitude towards women's sexuality and activities of Mau Mau male dominated political agenda. The Mau Mau created a political context out of the ban on female circumcision. Elsewhere in Meru, it is recorded that the Mau Mau movement provided a political context in which girls and women decided how to defy the ban on female circumcision by circumcising themselves-*Ngaitana* (Lynn, 2003:95).

However, it should be noted that the majority of the circumcisers who circumcised women in secret places were women themselves. They were the majority who were molesting and abusing the uncircumcised girls. These women who were taking part in female circumcision claimed that practice made girls mature, marriageable and able to negotiate their social space with men. Most of the girls feared if they don't undergo female circumcision they would be denied adulthood rights and privileges to marriage while the elder women feared if their girls were not circumcised the women would be intimidated and harassed by their Agikuyu male age group counterparts. Thus, Agikuyu women continued with female circumcision in secret ignoring its health and moral implications of the practice as a way of social acceptance and (Mary Mukura, O.I, 3/11/ 2013).

The transformation that took place on female circumcision during the State of Emergency had diverse implications on women's social roles, values and gender relation. Traditionally, expected Agikuyu gender division of roles, social values, and power relationships were defined clearly during the circumcision rite (KNA ADM/15/8/2 in MA/1/13,1953).

This was perhaps the reason why at the initial stages of the State of Emergency, the circumcised women in Mau Mau were only allocated domestic roles in accordance to their perceived traditional expectations(Ngumo Muraya, O.I,7/11/2013). Women's voices were notably absent in the early stages of Mau Mau war but in the course of the war, women duties went beyond domesticity. The Mau Mau women combined domestic tasks with military duties like cleaning guns, and helping in making weapons, carrying information and transporting weapons from villages to the detention camps. It is also known that some women participated in the actual guerrilla fighting in the forests. A number of women were commissioned up in high military posts such as the rank of colonel while others joined Mau Mau men and women councils (Achola et al, 1975; Likimani, 1984; Wamue, 1999).

While the women who participated braved the cold, rains, and darkness in the forest, the loyalist's men were enjoying their sleep. Women also gave the Mau Mau fighters' moral support and nursed their wounds (Elizabeth Wanjiru, O.I, 25/ 11/2013). However, in most cases they were viewed as a source of conflict in the movement. There was a constant debate on whether they should be given warrior status. According to Acholla et al, (1975:215-216) "only a few like Field Marshal Muthoni who raised to prominence and leadership of other women gangs". The initial singling out of women's participation in Mau Mau fighting in the forest was led by the popular stereotype held by Mau Mau warriors who thought that women would become an unnecessary burden within the movement. Secondly, until this time politics was seen as a male domain and so it took a lot of bravery for women to participate in the male dominated Mau Mau movement (Lynn (2003), Eliud Njoroge, O.I, 25/11/2013).



In most cases, women also acted as go-betweens and carriers of food and firearms to the freedom fighters and provided a rough system of intelligence. The majority of the Mau Mau fighters were forced to receive most of their food from children and women back in the reserves (Women's League, 1953). These tasks were very risky and dangerous and majority of women lost their lives in the process while others were imprisoned. Although it is notable that the circumcised Agikuyu women were given some opportunity to participate in the political agitation during the Decolonization period, they still lagged behind their male counterpart. It was even worse for the uncircumcised women whose values, status and gender relations continued to deteriorate (Ruth wa Waihera, O.I,  $10^{/11/2013}$ )

It is unfortunate that the Mau Mau women were hardly known or recognized. They were overburdened and suffered greatly during the war but were never acknowledged like men. Their male counterparts managed to make their ways into the post-independence political arena and were given land title deeds. Women were more-less forgotten and dispossessed by male dominated post-colonial government during the dishing out of the "fruits of the struggle". Nevertheless, the Agikuyu women had considerably begun to participate in the political arena. According to Ahlberg (1991), the tenacity of the Mau Mau inspired various women's collective role and had to adopt new bases of group control, especially in self-help groups and development groups (*Maendeleo ya Wanawake*). Through the experience of the communal land terracing and public works, the Agikuyu women had once more learnt the benefits of working in a group other than individually. The traditional spirit of cooperation (*ngwatio*) was still in their minds. When the *Manedeleo Ya Wanawake* Organization was formed 1n 1952, it provided a forum for women to work together to improve their standards of living and to work directly with the colonial government Wipper (1975:99-119).

## 4.3 Impact of the Colonial Counter Measures on Female Circumcision and Its Implication on Gender Roles and Values

During the Mau Mau state of Emergency, the colonial government used various measures to combat the Mau Mau rebellion. For instance, it came up with the 'Swynnerton' plan that introduced in late 1952 to counter the Agikuyu participation in the Mau Mau rebellion. The plan was theoretically aimed at improving Africans agriculture through land consolidation and increased cash crop production (Roseburg and Nottingham, 1966:304). This plan together with other economic changes excluded Africans from direct participation in the growing colonial economy and prevented their participation in the Mau Mau war. The plan suggested the terracing of land for soil conservation through communal labour before the cash crops could be planted. Given that women were the majority in the reserve and in villages, they were mostly involved in this communal terracing and public works. They had organized themselves in working groups (*mwethya*), which went from farm to farm digging terraces. According to Njehia, many women in Kikuyuland were landless, unemployed, overburdened, and malnourished (Njehia wa Koinange O.I, 10/11/2013).

The plan also involved land consolidation into a single holding and issuing registered title deeds to individuals. The report by Secretary of Trust Land Board shows that in Kiambu, Fort Hall and Nyeri a total of 666,525 acres were consolidated into 145,779 farms and registered



under 126,713 Titles Deeds. This plan considerably displaced the former land tenants (*ahoi*) within the Agikuyu traditional land tenure systems. Thus, the years between 1953 and 1955 saw thousands of Agikuyu homesteads all over the countryside destroyed and about 950,000 people moved into villages and reserves (Nottingham, 1966:304). The colonial land consolidation made the Agikuyu pre-colonial communal land ownership by clan (*mbari*) irrelevant. Though some benefits accrued from land consolidation such as effective soil conservation and increasing individual enterprise, the Agikuyu women were greatly marginalized and impoverished given that they relied on this land for the household food production.

Land consolidation was then followed by their provision of extension services and credit facilities. The idea of the provision of extension services and credit facilities to the male landholders was also introduced. Women became increasingly dependent on their husbands whose names were used to register land and as a security for acquiring credits and loans. As a result, women considerably lost their traditional control over land use for food production and distribution (Shannon, 1957, Wipper, 1975). The process of land consolidation also encouraged production of cash crops than food crops. This significantly decreased their traditional economic independence that the Agikuyu women enjoyed. The emerging social structure was not only male-dominated, but also ensured that women lagged behind in the new European patriarchy institutions.

Closely related to land consolidation was the "villagization" scheme through which the War Council Decree of June 1954 forced people into massive population movements, with houses being burned and others abandoned (Colonial Annual Report, 1954). In addition, Sorenson (1967:110) observes that "by October 1955 1,077,500 Kikuyu and Embu had been moved into 854 villages. Each village got its own home guard. In these villages curfew was imposed, strong fences created and deep trenches dug all round. Villagers lived in absolute poverty, providing the colonial government with a chance to pursue forced labour. The villagisation plan adversely affected food production so that it became increasingly hard for women and children to sustain themselves. It also made it extremely difficult for people to engage in massive communal feasting and ceremonies such as circumcision. People did not have time to attend such occasions due to the government's restriction and curfews.

The colonial rehabilitation measures denied women their considerable authority over the traditional rites. Under the supervision of home guards, women were forced into communal labour for long hours from six in the morning to six in the evening (Rahab Wanjiru Mungai O.I, 21/11/06). This work included clearing bushes to prevent the Mau Mau fighters from getting hideouts close to the villages. Many of women were seen in large groups leaving the villages very early in the morning and coming back late in the evening. Only little children were often left in the village. In the evening, the villagers were allowed to attend to their small piece of land but only very little could be accomplished because people were very tired (Gachuhi, 1999).

According to Peter Gateru (O .I, 3/11/2013), the circumcision ceremonies and their vigor reduced significantly during this. This could be related to the fact that during this time, many



of the Agikuyu people had been forced into villages, while others were displaced. Secondly, many men were in detention camps and others were in the forest far from their homes. Evidence indicates that there were about 1,700 convicts and 50,000 detainees in various detention centers in the country by 1954 (Sorrenson, 1967:128). The detainees were harshly treated. They were subjected to poor diet and terrible hygienic conditions, hard labour for long hours, and physical injury during the12 interrogation processes. Those women who supplied food, money, ammunition clothing, and information risked being arrested and put in detention camps (Gachihi, 1986). During this time, majority of the people who had been left in the reserves were women, children, and few old men (KNA PC/CP/6/4/16: 1957). These people concentrated on solving urgent needs like looking for food in order to survive. Consequently, circumcision ceremonies were left for some time and only a hurried operation was conducted in hospitals, homes, and banana plantations or in bushes. After the procedure, one woman was left in the village to cook and give food to the initiates while the other women went away to play various roles in Mau Mau protest or in communal forced labour.

In addition, through the Deportation Ordinance of 1954, leaders of Mau Mau were deported and detained without trial. Given that a woman's major role in Mau Mau war was that of smuggling food, money, ammunition, and information, increasingly number of them were imprisoned and detained in the process. Shannon (1957: 276-84) estimates that by October 1955, 6,800 Kikuyu women were in prison, detention, or work camps. Many of their children survived without parents to take care of them. Moreover, Shannon reports that in the camps, women were forced to communal labour and experienced all sorts of sexual harassment. Indeed, by the end of 1950s the colonial government had largely completed most of its 'rehabilitation' programs in most of Kikuyuland.

## 5. Conclusion

In conclusion, it is notable that the activities that took place during the Mau Mau war in Kenya considerably disrupted the practice of circumcision in Kikuyuland. This had significant implications on the Agikuyu women's roles, and gender relations. Particularly, preparation of the ceremonies and feasting decreased greatly due to lack of wealth and foodstuffs because of the political instability. The circumcision procedure was also affected by the colonial restrictions, ban enforcement, and the war counter measures. Thus, it was extremely difficult for the community to assemble for the ceremonies due to the fear of being suspected as a subversive Mau Mau group. The colonial government also applied various strategies of regulating the Agikuyu circumcision and they made sure that those who defied the regulations were severely castigated and punished. In addition, the efforts by the Agikuvu people to liberate their culture from colonial restraints through hostility also affected the initial value and meaning of Agikuyu circumcision. Indeed, because of frustrations, the Mau Mau fighters did anything to draw colonial attention by showing defiance to the circumcision restrictions and ban. In the process, most of the traditional gender roles and relations that were fashioned through the practice of circumcision were lost. The main disadvantage of this loss was that no valuable alternative rite of passage was put in place of the highly valued traditional female circumcision. This paper concludes that, an alternative rite of passage would be introduced in way that it eliminates the harmful aspects of the female circumcision



to women's health and retains all the positive character training aspects of the tradition. But evidence indicates that the important aspects of the tradition such as character training vanished in the process of colonialism leaving only a hurried physical 'cut' that was in most cases conducted in secret and more often than not in unhygienic conditions. Thus, by the time Kenya got independence, female circumcision did not emphasize on character training, socialization, and sexuality guidance process. In most cases, all that was being done was a hurried physical operation in secret and in hospitals. The overall observation is that with the lack of instructions and proper guidance on roles, values, social relation, and sexuality, the Agikuyu women went by far out of their control. It is apparent that they increasingly engaged in premarital and extramarital sexual relations. This amounted to a higher rate of unwanted pregnancies and lake of proper life skills, which prevented the victims from improving their social, economic, and political status. Thus, the changes in the circumcision process and procedures during the Mau Mau continued to put the Agikuyu women in a more underprivileged position and intimidated social status. Nevertheless, the practice still continued even after the formal political independence but had a blend of western culture.

## References

Achola, P., & Awori, T. (1978). *The Participation of Women in Kenya society*. Nairobi: Kenya Literature Bureau.

Ahlberg, B. (1991). Women sexuality and the Changing Social Order, the Impact of Government Policies on Reproductive Behaviour in Kenya. Philadelphia: Gordon And Breach.

Anfrend et al.(2004). Concept, Methodology and Paradigms. CODESRIA, (Gender Series 1).

Arnold, G. (2015). Kenyatta And Politics of Kenya. Nairobi: Tran Africa.

Barnett, & Njama. (1966). *Mau Mau from within: An Autobiography and Analysis of Kenya's Peasant Revolt*. New York: Lodon.

Bonareri, M. (1997). *Female Circumcision, and its Impact on Women's Role in Society* (Masters). Kenyatta University.

Cavicchi, E. (1977). Problems of Change in Kikuyu Tribal Society. Italy: Bologna.

Dilley, M. (1966). British Policy in Kenya Colony. Nairobi: Government Printer.

Frost, R. (1978). Race Against Time, Human Relations, and Politics in Kenya Before Independence. London: Transafrica.

Gachihi, M. (1986). *The Role of Kikuyu Women in The Mau Mau* (Masters). University of Nairobi.

Githige, R. (1978). *The Religious Factor in Mau Mau Oaths; With Particular Reference to Mau Mau Oaths* (Masters). University of Nairobi.

Kelly, G. (1984). The Social Relation of the Sexes; Methodological Implications of Women's History. Califonia: Stanford.



Kenyatta, J. (1938). *FacingMount Kenya; The traditional life of the Gikuyu*. Nairobi: Martin Secker.

Kershaw, G. (1992). Mau Mau from Below. London: Ohio University Press.

Kinyati, M. (1980). Thunders from the Moutains, Mau Mau patriotic Songs. London: Zed press.

Lambert, H. (1956). Kikuyu Social and Political Institutions. London: Oxford.

Leakey, L. (1952). Mau Mau and the Kikuyu. London: Methuem.

Leigh, L. (1954). In the Shadow of Mau Mau. London: W.H. Allen.

Likimani, M. (1985). Women and Mau Mau in Kenya. London: MacMillan Publishers.

Lynn, M. (2003). *Politics of Womb; Women, Reproduction and the State In Kenya*. Kampala: Fountain Publishers.

Maloba, W. (1993). Mau Mau and Kenya, an Analysis of the Peasant Revolt. London: Oxford.

Mbilinyi, M. (1984). Research Priorities in Women Studies in Eastern Africa. *Women Studies International Forum*, 7(4), 289-300. http://dx.doi.org/10.1016/0277-5395(84)90054-2

Moore, H. (2015). Feminism and Anthropology. Cambridge: Policy Press.

Ngugi, T. (1965). The River Between. London: Heinemann.

Nottingham, R. (1966). The Myth of "Mau Mau"; Nationalism in Kenya. London: Stanford.

Robert, G. (1954). The Mau Mau in Kenya. London: Stanford.

Said, E. (2015). *Identity Negation, and Violence; Politics and Dispossession*. London: Vintage.

Sandgren, D. (1976). *The Kikuyu, Christianity, and the African Inland Mission*. Madison: University of Wisconsin.

Savage, C. (1974). Government and Labour in Kenya 1895-1963. London: Frank Cass.

Sorrenson, M. (1967). Land in the Kikuyu Country, A Study in Government Policy. Nairobi: OPU.

Spencer, J. (1977). Some Perspectives of Mau Mau Movement. *Journal Of Kenya Historical Review*, *5*, 57.

Thompson, J. (1985). *Learning Liberation, Women's Response to Men's Education*. London: Helm.

Wallerstein, E. (1980). *Circumcision, an American Health fallacy*. New York: Springer Publishing Company.

Wamue, W. (1999). Gender Roles and Status Of Agikuyu Women, A religion-Cultural



approach (Ph. D). Kenyatta University.

Wipper, A. (1975). African Women, Fashion, and Scape Goating. *Canadian Journal Of African Studies*, 62, 111.

## Appendix

Appendix 1: Primary Sources
A. Archival Sources
KNA DC/KBU/I/6, 1943 Colonial annual Report by H.E Lambert,1943.
KNA PC/CP/8/7/6: Political Situation, The Kikuyu Province, 1950-1953.
KNA PC/CP 1/4/4, 1955: The Kikuyu District Political Record, 1955.
KNA PC/CP 1/4/4, 1955: The Kikuyu District Political Record, 1955.
KNA DC/KBU/ADM 2/2/81-16: Circumcision General, 1953.
KNA PC/CP/8/7/1/22, 1956): Female Circumcision, November 10th, 1956.
KNA PC/CP/6/4/16: Native AffairsGeneral Policy, file, 1955
KNA PC/CP/6/4/16: Native Affair General Policy, 1957.
KNA GO/3/2/74 vol ii: Historical Survey of the Origins and Growth of Mau Mau, 1968.
KNA ADM/15/8/2 in MA/1/13): Native Customs- Circumcision, 1953.
KNA CCK/R11/7/6,1952-1954: Mau Mau Memorandum, 1952-1954.
KNA CCK/R 11/7/6, Mau Mau Memorandum, 1952-1954

D. Orai Sources			
Name	Division	Date	Occupation
Eliud Njoroge	Gatundu	25 <sup>th</sup> Nov/2013	Elder
Elizabeth Wanjiru	Gatundu	25 <sup>th</sup> Nov/2013	Teacher
Gathoni Mbugua	Limuru	4 <sup>th</sup> Nov/2013	Farmer
Jecinta Waithera	Gatundu	28 <sup>th</sup> Nov/2013	Cobbler
Joseph Mwaura	Kikuyu	13 <sup>th</sup> Nov/2013	Farmer
Josphat Kariuki	Lari-Ndeiya	22th Nov/2013	Farmer
Paul Ndirangu Karinga	Kiambaa	9 <sup>th</sup> Nov/2013	Churh elder
Koinange Njeria	Kiambaa	11 <sup>th</sup> Nov/2013	Famer
Margaret Njeri Ngugi	Kikuyu	11 <sup>th</sup> Nov/2013	Farmer
Mary Wanjiru Mukura	Limuru	3rd Nov/ 2013	
Ndegwa Muita	Githunguri	7 <sup>th</sup> Nov/2013	Shopkeeper
Ngumo Muraya	Githunguri	7 <sup>th</sup> Nov/2013	
Njori Wamagara	Kikuyu	21 <sup>st</sup> Nov/2013	FormerCircumciser

## B. Oral Sources



Peter Gateru	Limuru	2nd/Nov/ 2013	Chief
Rahab Mukami	Gatundu	28th Nov/2013	Farmer
Rahab Wanjiru Mungai	Kikuyu	11 <sup>th</sup> Nov/2013	Farmer
Ruth wa Waihera	Kiambaa	10 <sup>th</sup> Nov/2013	Chief
Waringa Wangeria	Limuru	3rd Nov/2013	
Zipporah Nyambura	Kahawa	27 <sup>th</sup> Nov/2013	Business lady

Appendix 2: Map of Kiambu District



Source: Kiambu District Development Plan 2000/2004

## **Copyright Disclaimer**

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (http://creativecommons.org/licenses/by/3.0/).