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TRADITIONAL POSHO MILL AMONG THE ABAGUSII AS INDIGENOUS INNOVATION IN ENTREPRENEURSHIP

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ABSTRACT

African indigenous knowledge is important in innovations, but due to negative perceptions by foreigners, some were discarded and became extinct due to lack of handover to subsequent generations. This could have been avoided if African culture had been incorporated in western education to bring the young and old together in common task of knowing, bettering and sustaining what was ideal in their environment. The Abagusii invented the traditional posho mill [*etinga*] as an enterprise for the business of grinding cereals. It was widespread in different regions in gusiiland of western Kenya. However, instead of research being done to modify and improve its speed and preservation, it was left to become extinct. This study assessed how the posho mill could be modified and used in modern times. It used both interview and observations in collecting data from older people with indigenous technical knowledge of the invention and operation of *etinga* that can be one of Kenya's and Africa's innovations through branding. It is advantageous as it uses water energy in turning turbines, does not pollute the environment; has readily available water, and minimal maintenance once installed. Thus *etinga* should be modified and used in modern society.

Key words: *Posho mill; Modification; Knowledge.*

INTRODUCTION

The African knowledge was key in innovations, but due to negative perceptions of the foreigners, some important innovations were discarded and the indigenous knowledge became extinct due to deaths and burial of knowledge due to lack of handover to other generations. According to Bogonko[1994], these negative developments could have been avoided if African culture had been considered in the western education. Such policy would have brought the young and old together in common task of knowing, bettering and sustaining what was ideal in their environment. The Abagusii invented the traditional posho mill [*etinga*] as an enterprise for business and used to grind cereals, and were widely spread in different regions in the gusiiland of western Kenya. Innovation is a term applied to mean the creations and revelation of certain works, information and ideas which has never been disseminated to any school of thought. **Innovation** is a term used in this study to refer to both radical and incremental changes to Information Communication Technology ICT products and processes. In the university context, innovation is linked to performances, and growth through improvements in efficiency, productivity, quality competitive positioning market share, etc [Wikipedia, the free encyclopedia].

Epistemology of traditional posho mill [Etinga]

The traditional posho mill [*etinga*] was the second phase of the inventions of the techniques or methods used in grinding cereals among the abagusii. The first phase was the invention of the simple African technology of the available materials. They innovated a rectangular big stone [*Orogena*] sculptured from a special rock and a smaller stone [*Ensio*], which used concurrently by rubbing the cereals against the two surfaces of the big stone intact on the

floor and the smaller stone held by the hands to and fro on the surface of the big stone. The person who grinded knelt down on one side near the end of big stone and held the *Ensio* [small stone] to grind using hands. The cereal was placed on the surface behind *Ensio* [small stone]. small quantity was placed to allow quick grinding, to and fro. The grinded flour falls at the end of the tip of the big stone, and then it was collected from the skin which was placed on the flour for collection after accumulation of flour grinded. As illustrated in Figure 1.

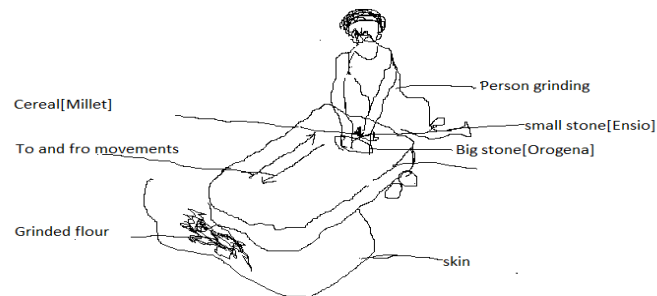


Figure 1. Traditional Method using two stones. Source: Researcher 2014

There were steps made before the grinding started as follows: first, the cereals were to be perfectly dried up; second, the big stone to be knocked on the surface to make it rough so that when rubbed with small stone [*Ensio*], it grinds faster without which, the slippery surface was slow and because the to and fro movements of the hand will also be slippery; third, the small stone [*Ensio*] was also knocked on the surface to be rough so as to be in contact with the surface of the big stone [*Orogena*] and grind faster; fourth, the big stone [*Orogena*] was to be uplifted at the background where the person grinding knelt, so that the gradient was sloppy to enable the faster movement of the hands holding the small stone [*Ensio*]; fifth, the cereals placed on the background surface of the big stone [*Orogena*] depended on the quantity to facilitate quick grinding; therefore, the smaller the quantity, the faster the grinding and vice versa.

Statement of the problem

The problem is instead of researches done to modify and improve the speed and preserve the knowledge, it is in extinction.

Objective of the research

The objective is to study how the posho mill can be modified and used in modern times.

METHODOLOGY

The research will use both interview and observation in collecting data from the old people surviving having the indigenous technical knowledge [ITK] of the invention and operation of *Etinga* [posho mill].

Data collection and Analysis

Data collected from the surviving old people in Gusiiland having the Indigenous Technical Knowledge [ITK] and Know-How [KH] of the innovation and operation of *etinga* [posho mill], gave the information in the oral form and recorded down by the research for academic and reference purposes. The data collected was tabulated and illustrated by use of diagrams.

The traditional posho mill [*Etinga*] was the second phase of the inventions of the *techniques or methods* used in grinding cereals among the abagusii. The first phase was the invention of the simple African technology of the available materials. They innovated a rectangular big stone [*Orogena*] sculptured from a special rock and a smaller stone [*Ensio*], which are used concurrently by rubbing the cereals against the two surfaces of the big stone intact on the floor and the smaller stone held by the hands to and fro on the surface of the big stone. Since the person grinding used energy as a method of propulsion, the hands became tired and required several people to grind so that to grind the quantity required to be cooked to satisfy the whole family members. The traditional Technique or Method, although helped in grinding the subsistence food in the family, it could not be used as an enterprise for commercial purposes because it had a lot of challenges and shortcomings as follows: it was very slow; it used people's energy as a method of propulsion; the quantity of the flour grinded was smaller or low; it was cumbersome to grind the flour during the special occasion like during ceremonies when plenty of flour was needed to prepare food to satisfy many people in

the ceremony such birth, circumcision, marriage, and death ceremonies; it caused health hazards to the person who grinded such as backaches and fatigues; it was not used for commercial and entrepreneurship.

Since the first phase of the traditional posho mill method or technique had shortcomings or drawbacks, the abagusii invented the traditional posho mill which was faster because was using water as source of energy to grind the stuff. The traditional posho mill could be used for commercial purposes and it had the following advantages as compared to the first method of grinding cereals:[i]it used water as source of energy for grinding; and [ii] because it was water energy to rotate the turbines, the speed was high and it grinded faster;[iii]the quantity of flour grinded was high to cater for preparation of food to satisfy the whole members of the family;[iv]it was used to grind a high quantity of flour used during important occasion such as ceremonies;[v]it never caused health effects to the operator or attendant;[vi]it was used for entrepreneurial purposes in the ancient times;[vi]Led to economic growth and development by improving the standards of living of people who owned *etinga*[Posho mill].

It is not clearly known who invented traditional posho mill [*Etinga*], where was it invented among the abagusii region and when was it invented. But from the Anthropological studies indicate that it was probably invented in early 1800. Because of poor records and lack of handing over information from one generation to another, it is not possible to trace and track sufficiently and effectively the origin of its innovation.

Traditional posho mill [*Etinga*] was invented and used for grinding cereals. It was a form of enterprise or business among the abagusii in the medieval period. Whoever who owned the posho mill [*etinga*] in the village, became a source of business and a source of accumulation of wealth. The posho mill [*etinga*] was not placed or located anywhere, but in special areas or regions where it was viable and strategic for its operation. The prerequisites for its location included steep gradient to enable the water directed to the turbine run faster and with high pressure; a river nearby with required volume of water to run the turbine; the stones from special rock[marble] used for grinding and installation. Because of the factors, people could come from very far for grinding purposes, and led entrepreneur purposes. The people who came for grinding paid through money currency method and others who could have used commodity [barter] method. Some of the items of commodity used were some of the quantity of stuff was scooped from the cereal to be grinded or eggs and so on.

RESEARCH FINDINGS

The preparation and installation of posho mill [*Etinga*] takes different steps sequential for its operation. The installation took seven phases or stages or steps as: preparation of the grinding stones; digging of the trench for installing the turbines and grinding stones and the channel diverted from the main river directed to the turbines; The preparation of turbines; the construction of the building where the grinding stones to be placed for operation or grinding; the preparation of the gear to control the speed of grinding stone during grinding or production process; the preparation of the trough[Orotuba]for directing water to the turbine and finally preparation of funnel shaped trough [Orotuba] for placement of food stuff to be grinded directed to the grinding stone. There was a stick suspended to the trough, as the grinding stone was rotating, shaking the funnel shaped trough for cereal and dropping slowly to nozzle of grinding stone and as being regulated by the rectangular trough. Findings are vital to Kenyans because it's one of our own innovations as Kenyans and Africans at large and make Kenya proud of its own innovation as it would be 'branded'kenyan, not Chinese or Japanese nor American and England made.

Preparation of the grinding stones: In this first phase preparing of the two stones was very significant, because it was the starting point of the posho mill after surveying the appropriate area of the location. The two stones were made from a special rock, marble type, which does not break or crack easily, sculptured in a circular shape. Stone A was placed on the constructed floor of timber inside a constructed house/building where *etinga* was placed. Stone A had a hole/nozzle wide which could allow rotation of the piston [wood] fixed into the turbine (Figure 2).

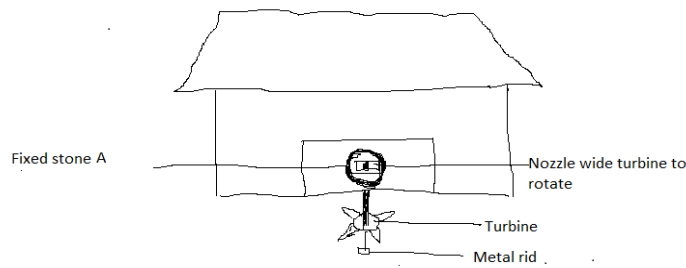


Figure 2. Stone to the floor: Source researcher 2014

The second stone B of a light surface and weight to enable the turbines rotate it, is designed to be fixed to the turbines to make it rotate anticlockwise as the turbines rotate by the force of water as illustrated in figure 3. The stones A and B, stone A is fixed permanently on the floor of timber and not to rotate and stone B which is fixed to the turbine rotates on the surface of stone A. The cereals were dropped from above placed trough in small quantities. This was the one rotating and grinding the cereals and dropped the flour in the circumference of the stone. The flour was accumulated and collected by a broom and put into the bag, sack or any container.

Digging of the trench and channel:

A deep trench is dug on the gradient of the slope which confirmed viable for installing posho mill. The dimensions of the trench are at least 7 feet deep, 5 feet width and 7 feet length decreasing with decreasing gradient of the slope as illustrated in Figure 4a. The trench is where the turbine is installed and the water from the trough [Orotuba] is directed under the floor of timber where the two stones grinding attached to the turbine are installed. The digging of the channel is for the purpose of diverting water from the main river towards the direction where the posho mill is installed. It is important to note that there are three channels dug for controlling and regulating water to the posho mill; channel 1 from the main river to the trough direct to the turbine. Channel 2, from control A [door] opened to allow flow of water directing to the main river when *etinga* [posho mill] is not operating, in other words closed, and control B [door] is closed to allow flow to channel 2. It is vital to note that the two control A and B were the “keys” for closing and opening *Etinga*. The last channel three is dug from the trench to allow water used from the turbine flow to the main river. The three channels MUST be in place for the posho mill [*etinga*] to operate. As illustrated in Figure 4b.

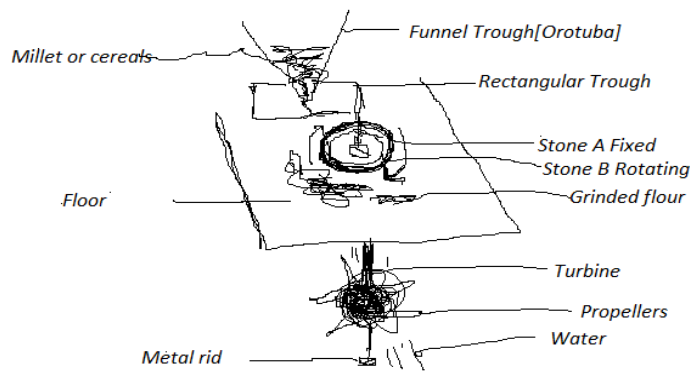


Figure 3. Stone B fixed to the turbine, rotates to grind. Source: Researcher 2014

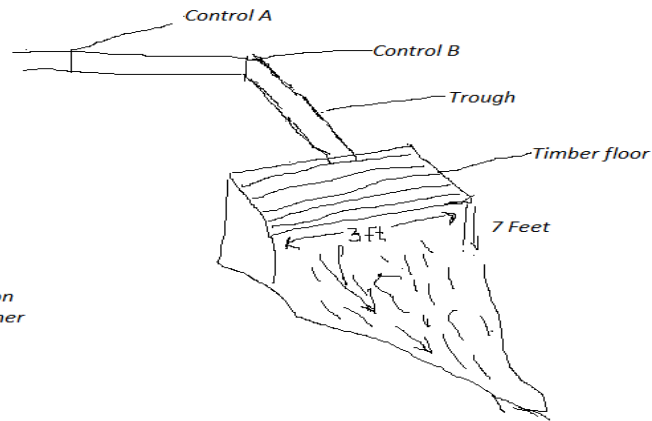


Figure 4 A. Construction of the trench. Researcher 2014

The construction of the building: a house is designed and constructed on the sides of trench so that to cover the grinding stones and the cereals for shelter and security purposes. The house is constructed one meter [3 feet] along the sides of the trench. As illustrated in figure 5.

The gear attached to the turbine

The gear was fixed connecting the tip of the turbine, which was a metal rid where the turbine rotates and since the turbine was attached to the grinding stone, when the gear is changed by raising it upwards, the grinding stone become lighter and rotates faster and grinds faster but the flour would not be ‘very fine’. When the gear is changed downwards the grinding stone becomes heavy as it’s in contact with fixed stone not rotating. The speed is slow and grinds fine flour.

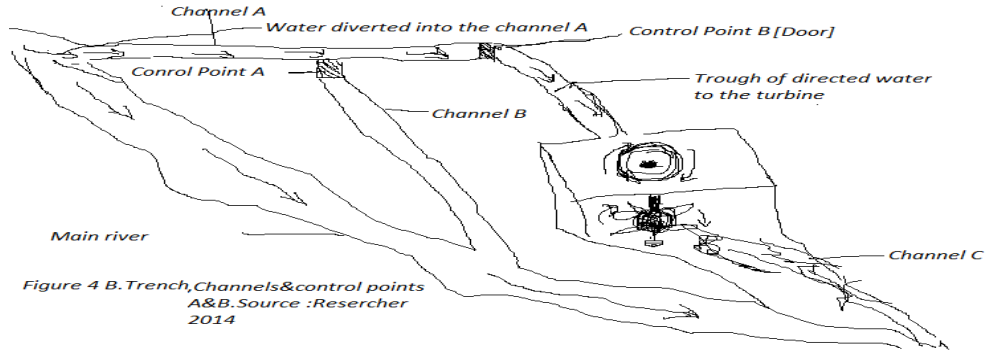


Figure 4 B. Trench, Channels & control points A&B. Source :Researcher 2014



Figure. Constructed house where posho mill is installed. Source: Researcher 2014

The preparation of the turbine

The turbine was prepared from a special tree [*Omotembe*] which does not break or crack once the turbines are fixed. They could have a minimum of 4 propellers and maximum 8 propellers depending on the weight of the rotating stone. The “lighter the grinding stone, the less the propellers and vice versa”.

Preparation of the trough [Orotuba]

The trough directing water to the turbine was prepared from timber. It is designed to have a wide space from the side of approaching water reducing to the side of water approaching the turbine. It is so designed deliberately to allow large volume of water at top to fall and compressed to narrowing opening to the turbine to make it rotate. The water ran in high speed as in “water fall” of river, because of the steep gradient and facilitated the turbine to rotate as illustrated in figure 6.

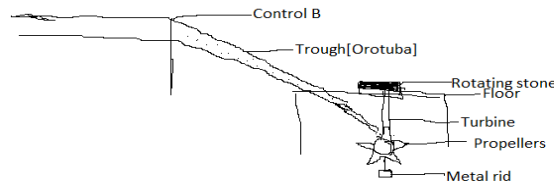
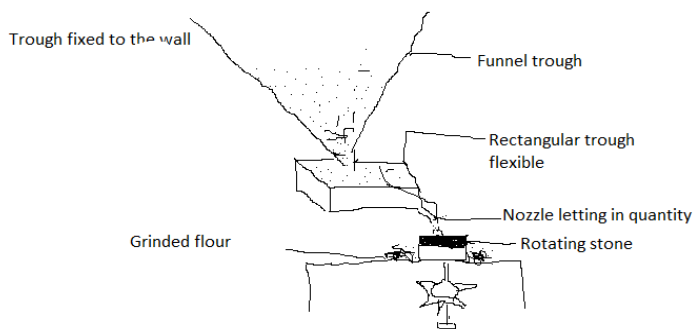


Figure 6. Trough [Orotuba]: source-Researcher 2014.

The preparation of the funnel trough

The funnel was prepared by use of timber had four sides and fixed to the wall to hold the cereal to be grinded. It was designed to be wider at the surface to accommodate enough food stuff to be grinded at least five kilograms. It was decreasing downwards to the tip in the bottom, to allow sequential quantity to be grinded. At the bottom of the funnel trough, there is a flexible rectangular trough with a nozzle dropping the quantity of cereals to the nozzle of the grinding stone. The rectangular trough fixed to the funnel trough could be raised up not allowing too much quantity depending on the type of cereal for example maize, it is adjusted downwards and for finger millet, it adjusted upwards by the string attached to it. As illustrated in figure 7.



researcher 2014

DISCUSSION AND CONCLUSION

In conclusion the posho mill is advantageous, first it uses water as a source of energy in turning the turbine, second does not pollute the environment; third, water is readily available in rivers and some quantity diverted and channeled to be used in the posho mill and fourth, there is minimal maintenance once installed.

According to Watkins and Ehst [2008], when should countries focus on building their research and development capacity and what sort of research and development should they strive to build-one that is focused on applied research

or one tends to emphasize basic research? In fact the according Arnold et al [2000],there are nine dimensions of technological capability:[1] awareness, [2] search [3] core competence [4] strategy [5] assess and select [6] acquire [7] implement [8] learn [9] linkage.

In the first dimension of awareness-among the abagusii and the rest of Africans, for achievement of innovation, the usefulness of every member of the group was of paramount importance; in the second dimension of search-was done in practical nature, the learning-by-doing as was a value of innovation techniques among the Africans; the third dimension of core competence was demonstrated by talents and gifts of people displayed by people in performance in any aspect in that particular community; the fourth dimension of strategy, is emphasized and encouraged by almost static and general knowledge of the people; the fifth dimension of assess and select in relation to the posho mill [*etinga*] viable place was assessed and selected for installation; the sixth dimension of acquire-the materials for the preparation posho mill were acquired for the installation purposes; the seventh dimension of implement-the indigenous education can borrow literacy, numeracy and formalism from western education the latter could borrow functionalism, environment-centredness and practicalism from the former [Bogonko,1994;4], for implementation; the eighth dimension, learn-there was no specialized training to operate the posho mill [*etinga*], it was practical approach for the purpose of general knowledge and education; and the ninth dimension of linkage-since that education was largely conservative, there was little room for innovation and therefore, the scope for experimentation with ideas and techniques was extremely limited [Bogonko, 1994;4], and there was linkages of knowledge and dissemination of skills.

Recommendation

It is recommended *etinga* should be modified and used in modern society, following the nine dimensions of technological capability of:

- (i) **Awareness** dimension of traditional posho mill[*etinga*] to be modified through scientific techniques and improve the speed;
- (ii) In **search** for relevant skills and knowledge in science and technological universities for modifications;
- (iii) **Core competences** of experts of the indigenous knowledge and know-how are important for modification;
- (iv) In **strategy** dimension, of making *etinga*[posho mill] permanent in use as a source of business enterprise in Kenya; **assess and select** dimension the excellent and effective modality of modification by use of electricity and metal material where wood material is used;
- (v) **Acquire** dimension, the relevant knowledge from the surviving experts and use for modifications;
- (vi) In **implementation** dimension-the introduction of technology is often cited as one of the justifications for the development of interactions between education and productive work. These justifications are based on the increasing interest taken in the study of the impact of technology on the levels of the government, on the appearance of new concepts such as those of alternative, intermediate, soft, appropriate and other technologies, and on the problems raised by the transfer of technology [Carton, 1984;15];
- (vii) In **learn** dimension, a scientific instrument is only developed at the meeting-point between some device and a scientific need-such a measure movements with precision. As soon as Galileo learned of the existence of the telescope invented by Lippershey and Janssen, he could calculate the grinding and the strength of lenses. The technical result was therefore maximum accuracy in prescribing-and therefore manufacturing-lenses, hence the need for accurate and mathematical grinding tools[Carton,1984;15];
- (viii) In **linkage** dimension-this presupposes the ability to theorize certain technical problems on the basis of scientific concepts, thus creating an organic link between science and technology[Gille,1978],and link to the indigenous African technical knowledge[IATK] as displayed by the *etinga*[posho mill] among the abagusii of Western Kenya.

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