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The dark side of Galamsey: Portraying the effects of Galamsey on the environment using metal sculpture

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Abstract---Illegal small-scale mining popularly referred to in Ghana as ‘Galamsey’ has been a serious menace to the society and the environment. Since gold is one of the most valuable natural mineral resources in the country, and legal mining is accompanied by a lot of rules and regulations, a lot of individuals in a bid to get rich quick find dubious means to dig for it. The media houses have stressed the effects of galamsey on the environment. However, it has not made much impact. This paper focused on constructing a metal sculpture to depict the negative effect of galamsey on the environment. It, therefore, adopts the arc welding technique by using metals and scraps to create a conceptual metal sculpture to educate the public about the effects of Galamsey on the environment. Studio-based research method was used for the study. The project was successful and the results were analyzed under the social, philosophical, artistic and intellectual contexts. The finished work was titled “Enkum yEn wiasi”, an Akan expression which means “Don’t kill Our World.”

Keywords---galamsey, environment, mineral resources, mining, sculpture.

Introduction

Coakley (1999) asserts that Ghana is blessed with a lot of mineral resources such as gold, bauxite, and manganese among others. He further states that mining is one of the major sectors in Ghana as it is the second-largest gold producer in Africa after South Africa. Brayan (2008) identifies mining in two categories; large scale and small-scale mining, with the difference being that large-scale mining is usually carried out by large companies with a huge labour force and small-scale mining undertaken by a smaller group of people (usually 5-6) men. This same principle applies to the mining industry in Ghana. According to Yankson and Gough (2019), both scales of mining co- existed in Ghana for decades using the same mineralized land with large-scale handling underground mining and small-scale handling surface mining.

“Galamsey” is the word popularly used in Ghana to refer to illegal small-scale mining and this has grown out of control. Adjei, S. et al. (2012) opined that the term Galamsey is interchangeably used to refer to both small-scale mining and illegal mining. Adjei, et al., (2012) further stated that the phrase “Gather them and sell” explains the term Galamsey and what these workers do. The constant use of mercury (Hg) has seriously affected water bodies near mining areas. Another phrase used by people in place of galamsey is artisanal small-scale mining, which has become an albatross on the neck of Ghana’s government. Wireko-Gyebi et. al (2020) believed that the proliferation of illegal mining in Ghana, coupled with its environmental repercussions, especially on water bodies have compelled the government to ban all artisanal small-scale mining (ASM) activities in the country and therefore any means to educate the public about this menace is well embraced and commended.

Studies in Ghana have shown that artisanal small-scale mining (ASM) activities are often unmonitored and unregulated and as a result have led to the destruction of the environment in diverse ways (Baah-Ennumh, 2010;Hilson, 2017; Hilson & Maconachie, 2020;Veiga & Morais, 2014). A survey done by Oduro, O. W., et al. (2012) discovered that the average dissolved Hg concentration in the main Pra River located in Ghana surpasses the WHO (World Health Organization) guideline due to “Galamsey” operations from mobile rigs. As commonly said, “water is life” and excessive pollution of water bodies tend to affect a country’s ecosystem. Poor combined practices in rudimentary gold mining such as in Galamsey are reasons for the emission, abusive and haphazard discharge of mercury into the ecosystem (Swain et al., 2007; Meech et al., 1998; Pfeiffer and Larceda, 1988).

Hence, Ghana will be at a great loss in terms of restoring water, afforestation, treating disease, among others, even though huge figures are made from mining as stated by Coakley (1999). Amponsah-Tawiah and Dartey-Baah (2011) stated that in 1988, The Environmental Protection Council (Now Environmental Protection Agency) qualified yearly economic losses caused by environmental degradation to be at about \$41.7 billion, tantamount to 4% of total GDP. The negative effects of Galamsey have over the past few years been echoed through a different communication medium such as print, broadcast, Internet etc. However, it has not really made much effect on curbing the negative effects of small-scale

mining. There is thus the need to try another alternative means of communication, as the famous adage goes “there is more than one way to skin a cat” which in this instance would mean to curb the negative effects of small-scale mining. Society due to difference in personality and backgrounds vary in the way each individual would react to what they hear and see, as such communication ought to be designed to extract similar results from the target audience.

Art as a medium of communication through the use of metal sculpture possesses this very ability and can be used as an effective tool of communication. Sculpture through its mostly three-dimensional nature has a way of bringing things to life, passing across a more realistic and relatable information. There are a lot of artists that have used art as a platform and medium of imparting a group of people or a society concerning cultural, political, social and even religious issues. One of the well-known sculptural pieces made of metal, to be specific copper which advocates for slavery hence being a symbol of freedom and democracy is the statue of liberty, a broken shackle and chain at the feet of a woman holding a torch in a raised right hand depicts the national abolition of slavery in the United States of America. Per the statements referenced above, Galamsey has had many negative effects on our environment. These effects include deforestation, water pollution, and land degradation among others. These have not only resulted in economic losses but have cost the health and livelihood of society. Although the government and media have tried to reduce the menace of it through awareness, there are still other ways to address this issue.

Methods

The researchers employed the qualitative studio-based research method during the study. Pathak et al, 2013 opine that qualitative research ‘focuses on understanding a research query as a humanistic or idealistic approach’. They further explain that it is a method of study ‘used to ‘understand people’s beliefs, experiences, attitudes, behavior, and interactions’. Qualitative research, unlike quantitative research, does not employ the use of numeric data or scientific methods of experimentation and research. Studio-based research is a practice-based research, which involves the use of tools, equipment and materials in the creation of artworks accompanied by exegesis that explains or interprets the work. It makes use of typical studio practises in the area of specialization of the artist with an active and systematic documentation of the processes involved in the creative process.

According to de Freitas 2002, a good exegesis locates the work in an appropriate context, discusses methods and theoretical orientations, identifies and discusses the problems encountered in the work, describes practical responses to those problems and provides documentary evidence of the development or evolution of the work. The result of studio-based research is that the artist gains specialized knowledge and skills about tools, equipment, materials, concepts, processes and their applications. Working in their area of expertise, the artist forms an in-depth understanding of their practice.

Design Processes Concept and idea developments

Whenever we take a look at the environment there are three main elements, we as human beings have been graced with; these are the plants, animals and water bodies, which are on or close to the land. Galamsey has been a menace for some time and this has affected the environment in diverse ways; land through constant digging, water bodies by the use of chemicals and plants and animals through deforestation. The concept and idea are to merge all these elements into one abstract piece that will depict the effects of galamsey on the environment. Using this as an inspiration, the researchers thought was to design the artifact with three major sections; the animal, plant and water.

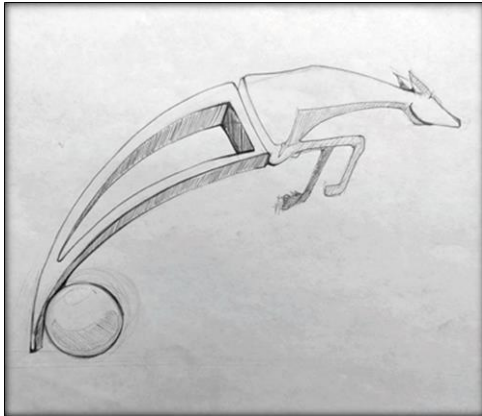


Fig. 1. Design 1



Fig. 2. Design 2

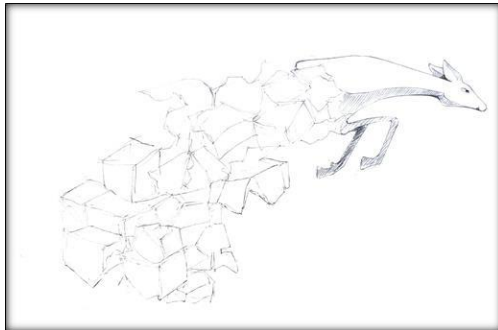


Fig. 3. Design 3

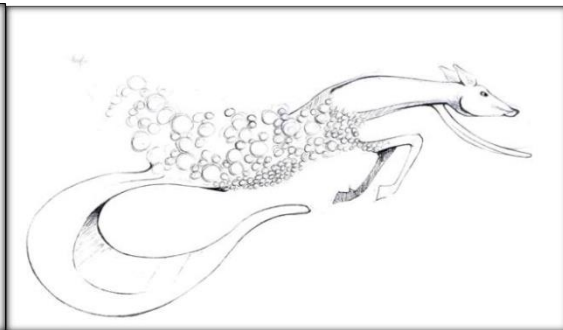


Fig. 4. Design 4

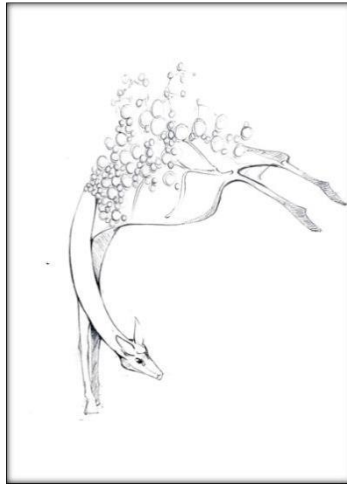


Fig. 5. Design 5



Fig. 6. Design 6



Fig. 7. Design 7

Figures 1 to 7 were further merged, developed and rendered in colour. The final rendered design depicts the cycle of life in the ecosystem and how galamsey affects it. The half representational animal was taken from one of Ghana's common tradition land wildlife; the antelope. This is because it's one of the most commonly known land animals in the country associated with forestry. Since herbivores depend on plants to survive, plants depend on the droppings and carbon dioxide from the animals to grow. We used bubbles to represent the flow of water. The proportion of human figures to the artifact, which represents the environment, shows how small humans are in comparison to other elements in the environment. Yet their actions have huge consequences on the environment, which are felt by all. The final rendered design can be seen below in Fig. 8.

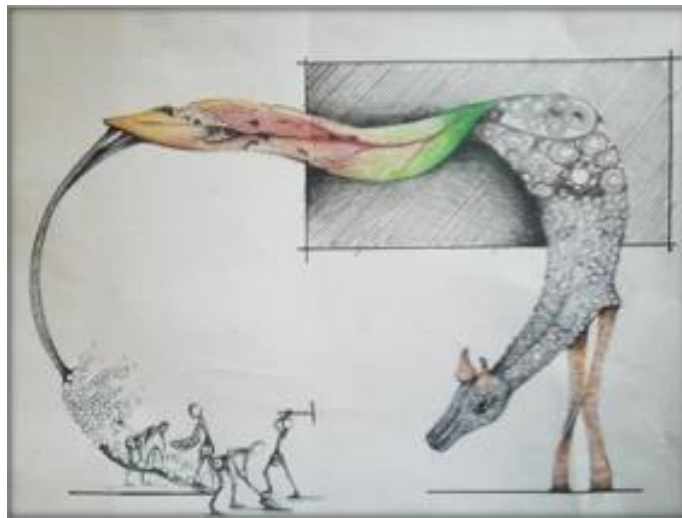


Fig. 8. Final Rendered Design

Final Rendering

The washers used for the main section of the antelope forms a representation of every single cell coming to together to make up a tissue which sums up together to form organs in the organism and is represented with the bicycle cranks. The head is always the main processing unit of any organism that's why the roller chain of the motor and bicycle was used depicting the intense drive it undergoes. The copper wire used on the leg depicts the strong and powerful muscle in the leg of an antelope, which it always presents by jumping whenever it is threatened. All being represented in a circular manner brings back the basic knowledge of the ecosystem, where animals depend on plants, and plants depend on the water bodies, however in an anticlockwise way, still sends the same message. For the finishing of the artifact, the antelope was left in its metallic yet rusty state to show an effect of decay, while the plant was also painted to communicate the same message and the water bodies sprayed black and gold to relay the message of distraction even though the illegal miners are mining gold.

The Fabrication Process

To begin the working process, a drawing was done on a flat surface to build the frame of the design as shown in figure 9.



Fig. 9. Finished sketch on flat surface



Fig. 10: leave

Steel rods were cut to the appropriate sizes using a cross cutter. With the aid of the anvil and hammer, the steel rods were cold-forged to form the frame of the leaf. Short rods were then welded to the edge of a metal table to aid the bending process. Next, the cold-forged steel rods were placed on the drawing to check if the shapes were correct. Then came the construction of the work. To begin the construction, the artist built an armature around serving as the framework around which the parts would be welded. The first part of the armature to be constructed was the leaf (figure 10), which was formed and welded from two bent steel rods.

The rods for the leaf was tacked in order to check the alignment. A steel rod was then welded in the center of the leaf to help keep the artifact stationary, balanced and straight while welding (figure 11). Another steel rod was welded to the left side of the leaf to help with the assembling of the antelope. The base was adjusted and welded to take the weight of the work when it has been fully formed. Rings made of steel rods were cold-forged for the elongated neck of the antelope. The rings were then welded on the steel rod to support the neck, with two other steel rods which were welded to the frame of the leaf to support it and form the upper part of the neck (figure 12).



Fig. 11. Adjusting the center rod



Fig. 12. Completely welded rings

In forming the armature for the head, steel rods of different lengths were forged and used in forming the head. The cut and forged parts were assembled and welded together to form the head and bearing balls were welded to depict the eyes of the antelope. Another rod was welded to the left side to form the leg and to further support the figure. In addition to the steel rod, four other steel rods were added to form the legs of the antelope as shown in Figures 11 to 12.



Fig. 13. Completely welded head armature



Fig. 14. Welding the legs completely

To form the body of the antelope, washers from bolts and nuts were individually welded to bring out the structure of the antelope, and as the welding progressed, grinding was done intermittently to eradicate excess oxides forming on it. Bicycle cassettes and cranks were welded to form the upper part of the antelope (figures 14 to 15).



Fig. 16. Welding of washers



Fig. 17. Welded Bicycle cassettes and cranks

Next was the forming of the leaf. A cardboard was used to take the exact shape and size of the leaf. The shape and size were traced onto a metal sheet, which was then cut out with the aid of a chisel and hammer. With the aid of chasing tools and a chasing hammer, the cells of the leaf were traced onto the metal sheet. The traced metal sheet was placed on the frame and welded to it. Three curved steel rods were then welded to the tip of the leaf, curved inside to face the antelope to form the cycle, as shown in figures 16 to 17. Both motor and bicycle chains were used in the construction of the head. They were placed vertically, running from the top of the head, down the mouth and under the chin to the neck. When set, they were welded to hold them in place, as illustrated in Figure 17.



Fig. 18. Measuring the leaf with cardboard



Fig. 19. Cutting out the shape of the leaf



Fig. 20. Welding the sheet



Figure 21. Forming the head using the motor and bicycle chains

The next step was the construction of the part representing the water body. Bearing balls were used to represent water and the bubbles it creates. Three steel rods were welded from the extension of the leaf to hold and support the bearing balls (Figure 21). To construct the human figures, the artist first made drawings of human stick figures on a flat surface to be used as a guide when welding. Bolts, screws and nuts were welded and used in the construction of the human figures depicting the activities of gamamsey. Sections of the bolts, screws and nuts were split, bent and welded to depict men practising gamamsey. The waist joint made using the hub of a bicycle was welded to the upper side of the figure. The legs for the figures were welded to both sides of the hip, and welding bent screws to the figure to make the arms. Additional bearing balls were welded to fill the space between the three-steel rods. The human abstract figures were welded in and on the bearing balls to illustrate men at work (fig. 22). Having finished with the welding of the human figures, the legs of the antelope were made by winding copper wires around the armature of the legs as shown in fig. 25.



Fig. 22. Welding of ball bearings



Fig. 23. Welding of figures



Fig. 24. Figures welded to bearing balls



Fig. 25. Completely weaved legs

Finishing

To begin the finishing process, filler was prepared by combining the filler and hardener. The filler was then used to cover dents and holes on the work. To ensure neatness, the filler was sanded using grade 80 sandpaper so that it blended with the work. The artifact was sanded to fill most dents and holes. Next came spraying. The researchers began the spraying process by first covering the animal part of the work with old newsprints in order to prevent the antelope from being stained with primer. Once the animal part was secured, the leaf and the bearing balls were sprayed in primer. Primer prevents the artifact from rust and serves as a base coat for the main colours to be sprayed. Once that was done matt black was applied on both the leaf and bearing balls.

For the antelope, lacquer, which was a combination of it and hardener, was used to keep the natural metal from rusting. After the spraying of the matt black on the leaf as a second coat base, the acrylic paint was painted using a painting brush. The first colour to be applied was green. Yellow was added and blended with the green in harmony. The next to be harmonized with the other colours was brown. Lastly black was used to draw out the cells of the leaf. Metallic gold paint was used on the human figures and bearing balls. This is also shown from figures 26 to 31.

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Fig. 26: Sanding of filler



Fig. 27. Application of primer on bearing balls



Fig. 28. Completely sprayed leaf in matt black



Fig. 29. Application of lacquer



Fig. 30. Application of black colour in cells.



Fig. 31. Applied metallic gold



Fig. 32. Final work ("Enkum yɛn wiasi")

Appreciation

The artifact was named in the Akan language; "Enkum yɛn wiasi" which translates "Don't kill our World" in English. The effects of galamsey on the natural environment inspired the name "Enkum yɛn wiasi". The artifact is a full metallic piece, which stands at 6 feet and 8 feet on a metal steel plate. The design was made in relation to the main elements of the environment, which are the animals, plants and water bodies. All were merged in a circular shape to depict the cycle of the effects of galamsey on the environment. It is a project that can be immediately identified by the vibrant green, yellow and brown acrylic colours of the leaf. The veins of the leaf were emphasized with black lines, creating a sharp contrast, which makes it stand out above the other parts of the work. On the left side of leaf is the antelope, representing animals. To the right, bearing balls have been welded to represent water bodies where galamsey operations are usually carried out. Men can be seen at work on the bearing balls, as shown by the human figures in different galamsey postures.

The antelope was made using 2.5cm washers, bicycle cranks and cassettes, and motorbike and bicycle chains. The head was made using the chains, and this depicts the head as the central place where thoughts are formed and all actions begin. Plated copper wires were used to form the ears. The washers form the neck to about the belly of the antelope; they have been arranged in a harmonious pattern, going side-by-side around the antelope. The holes in the washers add texture to the work as well as contribute to its aesthetic qualities. Cranks and

cassettes were used to form the upper part of the animal. By using metal scraps, the work depicts the need to not only save the environment from galamsey, but also encourages the need to recycle, which is another form of preserving the environment, hence, it can be said that the work arouses environmental consciousness. The antelope is in a jumping position; therefore, it is standing on its forelegs, showing an antelope on the move when it is being attacked. The legs have been made using copper wires too. The plated copper wires make the legs stand out, depicting the strength in the muscles.

A single leaf connected to the animal was used to represent plants. It is a flat sheet of metal and the veins have been chased. The leaf has been coloured using acrylic paint. The colours have been well blended from a rich green, slowly fading away into a yellow and brown colour. The image created is that of a dying leaf, affected by the activities of galamsey. The leaf goes down into the water depicted in the work by bearing balls. Bearing balls were used to represent water as they carry a semblance to the bubble effects seen in water bodies. Miniature stick human figures can be seen working the waters in search of gold. Hence the gold dust made by painting metallic gold paint on the human figures and bearing balls. It is worth noting that the human figures are much smaller in comparison to the rest of the work. This can be seen as quite ironical. As humans are so small as compared to the whole environment, yet their activities can have dire effects on almost every aspect of the environment.

The circular shaped project represents the ecosystem where all the elements depend on each other both in a clockwise and anticlockwise way. So we see the unfortunate cycle of galamsey; man works the water bodies in search of gold. By ignoring the rules and regulations of mining, the water bodies are affected. Plants depend on the water to survive and poisonous water affect vegetation. In turn, the animals depend on plants for food. Eating affected vegetation affects the animals. The animals also depend on water for survival, as do humans. Water poisoned by improper disposal of chemicals used during galamsey affect the animals and the cycle goes on if not checked and stopped.

Summary and Conclusion

Galamsey has been a menace, which has been on going for sometimes in the country Ghana. Owing to the fact that gold has a high value, a lot of people find ways and means to escape the right way to mine gather and refine them. Galamsey affects the environment when water bodies are polluted by the improper disposal of harmful chemicals, land and plants are degraded by deforestation and animals are affected because they depend on plants and water. Even though the effects have been echoed through different communications mediums it has not had much impact on reducing the negative effect it has on the environment. Since there are different ways to address issues, the project was geared towards the use of art; specifically metal art to buttress the points of the negative effects illegal mining has on the environment.

References

- Abdul-Gafaru, A. (2017). The Galamsey Menace in Ghana: *UGBS Policy Brief*, 5, 2
- Adjei, S., Oladejo, N. and Adetunde, I. (2012). The Impact and Effect of Illegal Mining (galamsey) towards the Socio-economic Development of Mining Communities. *International Journal of Modern Social Sciences*, 1, 38-55
- Amponsah-Tawiah, K. and Dartey-Baah, K. (2011). The Mining Industry in Ghana: A Blessing or a Curse. *International Journal of Business and Social Science*, 2(12), 62-69
- Baah-Ennumh, T.Y. (2010). *Sustaining livelihoods in artisanal small-scale mining communities in the Tarkwa-Nsuaem Municipality* [Unpublished doctoral dissertation]. Kwame University of Science and Technology.
- Barney, K. (2018). Reassembling informal gold mining for development and sustainability? Opportunities and limits to formalisation in India, Indonesia and Laos, In Lahiri-Dutt (Ed.) *Between the Plough and the Pick*, p.335 – 369. ANU press
- Brayan, P. (2008). Large Scale Mining Vs Small Scale Mining. *Ezine articles*, 28 November 2008.
- Coakley, G.J. (1999). *The mineral industry of Ghana*. Minerals Yearbook, Vol. III, United States of the Interior, Geological Survey
- de Freitas, N. (2002). *Towards a definition of studio documentation: working tool and transparent record*. Working Papers in Art and Design 2 ISSN 1466-4917
- Ghana Chamber of Mines (1998). *States of the Interior, Geological Survey*. Accra: Annual chamber of mines report.
- Ghanaweb (2017). *Galamsey menace: Causes, effects and solutions*. [Online]. Available at: <https://www.ghanaweb.com/GhanaHomePage/features/Galamsey-menace-Causes-effects-and-solutions-538404> [Accessed 02 August 2019].
- Hilson, G. and Maconachie, R. (2020). For the environment: An Assessment of recent military intervention in informal gold mining communities in Ghana. *Land Use Policy*, 96 (104706). <https://doi.org/10.1016/j.landusepol.2020.104706>
- Hilson, G., Hilson, A., Maconachie, R., McQuilken, J., and Goumandakoye, H. (2017). Artisanal and small-scale mining (ASM) in sub-Saharan Africa: Re-conceptualizing formalization and “illegal” activity. *Geoforum*, 83, 80–90.
- Kay, A. (2018). *Investing News Network*. Available at: <https://investingnews.com/daily/resource-investing/gem-investing/diamond-investing/alluvial-mining-gold-diamonds-and-platinum/> [Accessed 2019 10 13].
- Kesse, G.O. (1985). *The mineral and rock resources of Ghana*, Balkema, Rotterdam, 32-41.
- Meech, J.A., Veiga, M. M., and Tromans, D. (1998) Reactivity of Mercury from Gold Mining Activities in Dark Water Ecosystems. *Ambio.*, 27 (2), 92-98
- Oduro, O.W., Bayitse, R., Carboo, D. and Kortatsi, B. (2012). Assessment of Dissolved Mercury in Surface Water along the Lower Basin of the River Pra in Ghana. *International Journal of Applied Science and Technology*, 2(1), 228-235
- Pfeiffer, W.C. and Lacerda, L D. (1988) Mercury Inputs into Amazon Region, Brazil. *Env. Techn. Letters*, 9, 325-330.

- Swain, E., Jakus, P., Rice, G., Lupi, F., Maxson, P., Pacyna, J., Penn, A., Spiegel, S.J. and Veiga, M.M. (2007) Socioeconomic consequences of mercury use and pollution, *Ambio.*, 36, pp. 45–61.
- Veiga, M. and Morais, H. (2014). Backgrounder: Artisanal and Small-Scale Mining (ASM) in developing countries. Accessed at https://static1.squarespace.com/static/5bb24d3c9b8fe8421e87bbb6/t/5c2a832988251b499681df64/1546289962450/CIRDI-ASM-Backgrounder_2015Apr10.pdf
- Wireko-Gyebi, R.S., Asibey, M.O., Amponsah, O., King, S., Braimah, I., Darko, G. and Lykke A.M. (2020). Perception of Small Scale-miners on Interventions to Eradicate Illegal Small-Scale Mining in Ghana. *SAGE Open* 10 (4), 2158244020963668.
- Yankson, P.W. and Gough, K. V., 2019. Gold in Ghana: The effects of changes in large-scale mining on artisanal and small-scale mining (ASM). *The Extractive Industries and Society*, 6(1), 120-128.
- Arnawa, I.K., Sapanca, P.L.Y., Martini, L.K.B., Udayana, I.G.B., Suryasa, W. (2019). Food security program towards community food consumption. *Journal of Advanced Research in Dynamical and Control Systems*, 11(2), 1198-1210.
- Rinartha, K., & Suryasa, W. (2017). Comparative study for better result on query suggestion of article searching with MySQL pattern matching and Jaccard similarity. In *2017 5th International Conference on Cyber and IT Service Management (CITSM)* (pp. 1-4). IEEE.
- Exposto, L. A. S., & Januraga, P. P. (2021). Domestic waste characteristics and the management systematic review. *International Journal of Health & Medical Sciences*, 4(2), 253-259. <https://doi.org/10.31295/ijhms.v4n2.1731>