



## Research Article



# Gum Arabic Producers' Opinions and Views towards Gum Arabic Marketing Policies-and Strategies, Sudan

Mohammed O. Hassan<sup>1</sup>, Ali A. Salih<sup>2</sup>, Ibrahim E. Ibrahim<sup>3</sup>, Muneer Elyas Siddig Eltahir<sup>1\*</sup>, Hanan E. Alhabeeb<sup>3</sup> and Mohmoud A. Amassaib<sup>3</sup>

<sup>1</sup>Institute of Gum Arabic Research & Desertification Studies, University of Kordofan, P O. Pox 160, Elobied, Sudan

<sup>2</sup>Faculty of Agriculture, University of Khartoum, Shambat, Khartoum North, Sudan

<sup>3</sup>Faculty of Natural Resources & Environmental Studies, University of Kordofan, P O. Pox 160, Elobied, Sudan

\*Corresponding author e-mail: [muneersiddig88@gmail.com](mailto:muneersiddig88@gmail.com)

(Received: 25/01/2024; Revised: 25/03/2024; Accepted: 01/05/2024; Published: 20/05/2024)

## ABSTRACT

The study aimed to conduct a comparative analysis of the opinions and views of gum Arabic producers towards Gum Arabic marketing policies in Sudan. Primary data were collected in 2016, using a structured questionnaire and 150 gum Arabic producers were interviewed, representing 20% of the targeted population in the study. Secondary data were collected from related official documents. Descriptive statistical analysis was used to investigate the opinions views and socio-economic characteristics of the stakeholders. The results indicated that about (97%) of the respondents preferred the free-trade policy to concession as it gives more price incentives to producers (98%), encouraging producers (98%). There are 98 % of the producers conserve and reforest instead of cutting *Hashab* trees. All the respondents confirmed the prices are higher post-free-trade than pre-free-trade period. 74% of the gum producers were economically active including the young; this indicated continuing to preserve indigenous knowledge techniques of gum Arabic production across generations. The study recommended continuing the free-trade policy in the production and marketing of gum Arabic, involving the private sector to provide credit to the gum Arabic producers to expand their gum production area. Improve infrastructure and basic services in the gum Arabic production areas

**Keywords:** Gum Arabic Production, marketing policies, producers' views

## INTRODUCTION

Having been acknowledged as Sudan is the world's dominant leader in gum Arabic production; as it contributes to about 95% of the total world gum Arabic production (Abu Ali, 2011). It effectively controls almost 80% of the world market (Anderson, 1993; Abu Ali, 2011). Gum Arabic (*Acacia* species) is the dominant leguminous tree crop that belongs to the family *leguminaceae*. It includes over three hundred species of which *Acacia senegal* and *Acacia seyal* represent commercially traded species (Wuranti, 2010). The density of gum Arabic-producing trees varies from one area to another but the main zone of production of gum Arabic is located in West and North Kordofan States (Habish, 2012). The best gum Arabic quality is produced from *Acacia Senegal* (L.) Willdenow (*Hashab*). Most of the gum is produced by smallholders on individual farms where the trees grow. To get the gum, the tree bark is partially removed, and the gum is exuded in droplets from the wound. These droplets grow to nodules 2–5 cm in diameter and then picked. (Seifel Din and Zrroug, 1996). Gum production begins to decline when the tree is about 15 years old. When the land is taken back into

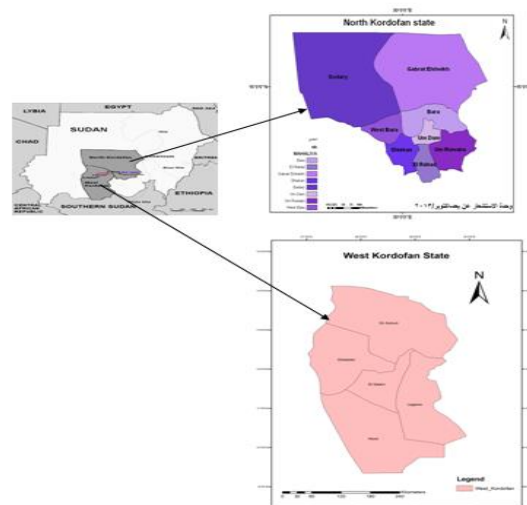
cultivation, the tree is coppiced. The land is then cultivated until its fertility falls below an acceptable level. During this time most of the trees regenerate naturally by coppice growth. Three to five years after cutting, trees tapped again. (Badi *et al*, 1989). The *Acacia Senegal* tree is tapped after the end of the rainy season. The suitable time depends on the end period of rain. The best time for tapping is usually recognized by the shedding of leaves and changes in the color of the inner bark from white to red (Hassan, 2008). Tapping is practised during two different periods. Early tapping is conducted from October until the end of November. Late tapping is done only for trees in agro-forestry system where *Hashab* trees were grown and the crops were cultivated between the trees, or for those trees in water collecting sites, from December till the end of February. The tools for tapping *Hashab* trees were the traditional axe and the developed 'Sunki (Adam *et al*, 2016). Gum exudation takes place a few weeks after tapping and is enhanced by hot weather whereas the yield of gum is delayed and decreased by cold weather. The gum is collected in several pickings depending on the time of

tapping. The first picking is collected five to six weeks after tapping. Then, the gum is collected in a series of subsequent pickings, until the end of picking season. Up to seven pickings could be reached if the tapping is done early. An average tree can yield about 100-300 grams per year. On a scattered wooded stand it was possible to collect 12-16 Kg per feddan one feddan is equal to (.44 hectare), while on a densely wooded stand, the yield can increase to about 40 Kg per feddan. The peak of production is obtained from the third, fourth and fifth pickings (Taha, 2000). The gum Arabic productivity differs from one tree to another tree and from one area to another, depending on a number of environmental and socio-economic factors such as high temperature, good rainfall in quantity and distribution, suitable time for tapping, free grazing, insect pests and diseases, and good prices. Accumulated indigenous knowledge about *Hashab* husbandry represents the major support for the production potentiality and sustains the resource base (Adam et al, 2016). Gum Arabic tree has values for non-marketable goods and services in terms of soil protection and restoration of soil fertility. Okoro (2011) cited that, gum Arabic plantations indirectly contribute to the improvement of the environment in areas threatened by desertification. The tree improves soil fertility by dropping leaves. It also fixes and stabilizes dunes and combats wind erosion. The increased density of gum Arabic plantations, they have the potential to act as shelter belts, that reduce the problems of desert encroachment, environmental degradation and poor soil nutrition. Gum Arabic is an important off-farm activity for more than 5 million of Sudan's population. In addition, producers hire entire families living in the gum belt for four months in the dry season. There was an average of 19% of household earnings come from activities related to gum Arabic (GAC, 2000). It is an important source of income in rural areas where opportunities are limited and where the workforce is often not mobile or unable to engage in more labour-intensive work. Gum collection or gathering is a source of revenue in rural areas providing income during the dry season when there is little other agricultural income (Taha, 2006). Poverty alleviation is one of the main aspects of gum production in socio-economic sustainability. Gum is a way for smallholders to diversify their livelihoods and alleviate the risk of subsistence crises (Olsson 1993). Gum Arabic is not only important for the smallholders, but also for the country of Sudan being a major source of foreign exchange. In recent years, it has accounted for about 13% of annual export earnings. For decades, gum Arabic has still one of the main agricultural exports from the rainfed agricultural area. Until the introduction of cotton in 1920, gum Arabic was the main source of export revenue in Sudan (Habish, 2012).

## MATERIALS AND METHODS

### Study Area:

Figure (1) gives the study area in the North and West Kordofan States. Which covers selected localities in North and West Kordofan States. North Kordofan state lies between latitudes  $16^{\circ} 38' N$  and  $12^{\circ} 14' N$  and longitudes  $26^{\circ} 46' E$  and  $32^{\circ} 22' E$ , the data in NK state was collected from Um-Ruwaba, Sheikan and Elrahad localities. West Kordofan lies between latitudes  $9^{\circ} 49' 29'' N$  and longitude  $27^{\circ} 54' 49'' E$  in the southern part of Sudan, the data in WK was collected from Ennuhod and Elkhwai localities. The two States are located in the heart of the Gum Arabic belt. North Kordofan State lies in the north-east part covering an area of 110483 ha, while West Kordofan State is found in the south-west part of the Kordofan gum Arabic belt covering an area of 153722 ha. The selected localities are the main production centres with a considerable contribution (60%) of the total gum of the country (Adam, 2011).



**Fig 1. The North and West Kordofan States maps** (Elamin and Adam, 2015)

According to high homogeneity of the localities in term of indigenous knowledge of gum producing techniques, the pure stand of *Hashab* trees and style of livelihood as reviewed by (ELbashir, 1999; ELkhidir, 2003; Ibrahim, 2013) households in the study area seem to be homogeneous due to the close interrelation of the various ethnic groups of farm households. They concluded that there is no wide variation to be found in lifestyles among people who live within one village, as well as among villages in the same area. Similarly, farm households in the study area are likely to be characterized by the traditional institutions subject to the regulatory rules of the tribes. Because of the homogeneity a sample of 150 producers was randomly selected. 30 respondents, from each selected locality, 10% of producers for each selected village were randomly chosen from June to December 2016. Primary data was analyzed using descriptive statistical analysis (SPSS) to investigate the opinions views and socio-economic characteristics of the stakeholders.

**Table 1.** Sample size of gum Arabic producer

State	Locality	No. villages/ locality	Total number of producers	No. respondents (10%)
North	Sheikan	5	306	30
Kordofan	Elrahad	5	302	30
	Umrwabba	5	301	30
West	Ennhoud	5	308	30
Kordofan	Elkhwei	5	306	30
Total	5	25	1523	150

## RESULTS AND DISCUSSIONS

### Socio-economic Structure of Gum Arabic Producers

Table (2) gives the socio-economic characteristics of gum Arabic producers in the study area. The results indicated that all respondents were males. Recently women entered this harsh activity and established special associations in Ennuhod locality, and in other localities, their contribution appears in the picking stage. In recent years, the production of gum Arabic has become attractive to producers. Most of the respondents had ages between (20 – 60) years. About 74% were economically active, indicating that gum production was not restricted only to old producers, due to encouraging prices that ensure easy and regular transformation of indigenous knowledge of gum Arabic production techniques among successive generations. Regarding the social status of the respondents, almost all producers were married, and their family members ranged between (6-10) individuals, a source of labor for producing gum Arabic. Even though, gum orchard owners depend on themselves or hire labor more than family labor because of their limited financial ability, they share their orchard and others have the financial ability to hire labor.

The percentage of producers who studied formal education was more than the illiterate, a dominating character of producers in the past.

**Table 2.** Distribution of gum Arabic Producers according to socio-economic structure

Variable	Indicator	%
Gender	Male	100.0
Age	20- 60 Years	97.0
Marital status	Married	99.0
Family size	6- 10 individuals	82.0
Educational level	Illiterate	28.0
	Formal education	55.0

### Distribution of gum Arabic producers by experience and tenure of gum orchards:

The production of gum Arabic has depended on indigenous knowledge about tapping trees, a technique acquired by learning by doing. About 46% of gum producers had (20 -40) years of experience in growing gum Arabic trees (table.3). Hence, the cumulative experience was a determinant factor for tapping on the right position to exude gum from gum trees. The study

area was the source of this technique from which it was transferred into the other producing areas of Sudan gum belt through casual labor. With regards to the types of produced gum, all respondents produce *Hashab* gum only. This study area has a pure stand of *Hashab* trees without any mix of other producing gum trees. The *Talh* trees are the dominant trees in South Kordofan State. Moreover, the gum produced in the study area (*the Kordofan gum*) is the size of a *pigeon egg* gum pebble. It is considered the standard of gum quality not only for producing areas in Sudan, but also for all producing countries in the African gum belt as well. About 58% of the gum producers have direct usufruct ownership of their orchards, while 25% are inherited. The study area was free from land tenure conflicts. The harmony in relations among the producers was reflected in annual tapping and the smooth supply of gum to the market. From the field survey, only one orchard owner registered his orchard area officially in Elkhwai locality.

**Table 3.** Distribution of producers by experience, gum produced, and orchard tenure

Variable	Indicator	%
Types of produced gum	<i>Hashab</i> gum	100.0
Experience	1-20 years	37.0
	21-40 years	46.0
Types of Orchard Tenure	Ownership	58.0
	Inheritance	25.0

### Distribution of the opinion of the gum Arabic Producers about the producing ages of a *Hashab* tree:

Table (4) gives information about the opinion of the gum Arabic producers about the best age for tapping the gum trees. The results in Table (4) revealed that about 82% of the producers indicated that the time for tapping gum – trees was when it is 4-5 years old and 80% indicated that the best age of a tree that gives maximum yield was when it is (10-15) years old. This period can be extended by applying the correct method of tapping, and protecting the tree against over grazing of animals, particularly camels grazing and fire outbreaks. About 68% indicated that the gum -tree gives minimum yield when it is (25-30) years old; at that age producers would cut down the trees leaving part of the tree stem to sprout for another cycle.

**Table 4.** Opinion of the gum Arabic producers regarding production ages of *Hashab* tree

Variable	Indicator	%
Tree age for first tapping/ years	(4-5) years	82
Tree age maximum productivity/years	(10-15) years	80
Tree age minimum productivity/years	(25-30) years	68



### Distribution of opinion of the gum Arabic Producers about expanding the area and source of tapping finance

The area of tapped gum differed from one year to another. Table (5) gives the opinion of the producers of gum Arabic about the effect of last season price on expanding the area of tapping gum Arabic. The price of last year seemed to be the main factor for determining the area to be tapped next year as suggested by 77% of the respondents. The farmer allocates most of the resources towards the production of crops that had high prices in the previous season. All producers depended on self –finance as there were no sources of formal finance in the study area. Only in one village, named Abu Ismaeil, the gum producers had gum producer association financed by the Revitalizing Gum Arabic Production and Marketing Project as a revolving fund. The source of self-finance comes either from field crops or livestock revenues.

**Table 5.** Opinion of the gum Arabic producers regarding expanding their area and source of tapping finance

Variable	Indicator	%
Factors affecting the expansion of the tapping area	Last season price	77.0
Source of tapping finance	Self- finance	90.0
Source of self- finance	Crops revenue	60.0
	Livestock revenue	11.0

### Marketing value chain, paying of taxes, levies and Zakat

Table (6) demonstrates the time of gum Arabic selling. All of the gum producers sold their gum immediately after picking. The producers did not store gum because any delay in selling decreases the weight. Therefore, they try to get rid of it promptly and sell at the current price irrespective of whether it is rewarding or not. Furthermore, gum producers did not have any other use for gum Arabic. About 42% of the producers sell gum to village traders and 30% to the middlemen. They later buy the gum in weekly markets (*Um dawarwar*: a weekly market that revolves among villages throughout the days of a week) on the day of the village market or in the nearest villages. Few sold in the nearest city to their villages, their main market the city itself such as Elobied with its surrounded villages. The producers are price takers and lack bargaining power. The traders determine gum prices in the market based on expected export prices, set of paid taxes, fees and Zakat on behalf of the producers.

**Table 6.** Gum Arabic producers' information on the marketing value chain, paying of taxes, levies and Zakat

Variable	Indicator	%
Time of selling produced gum	Immediately after collection	99.0
Channels of gum selling	Village trader	42.0
	Middlemen	30.0
Determination of selling price	The Traders	92.0
Paying of taxes& levies by producers	No	100.0
Paying of Zakat by producers	No	100.0

### Distribution of the producers of gum Arabic by their response to price incentives during the concession and free trade stages:

Table (7) shows the opinion of the gum Arabic producers about the incentive status of gum Arabic prices during the pre-and post-free- trade in Sudan. The question posed to find out to what extent the removal of the concession of gum Arabic company succeeded in creating price incentives, for producers of gum Arabic. From the table it was found that almost all the producers of gum Arabic were satisfied by the new pricing system. They confirmed that those prices gave incentives and added to their income in production activities.

**Table 7.** Distribution of the producers of gum Arabic by their response to price incentives during the concession and free trade stages

Variable	Indicator	%
Prices give incentives	Yes	98.0
	No	02.0
Gum Arabic prices are rewarding	Yes	98.0
	No	02.0
Gum Arabic prices are higher	Yes	100.0
	No	00.0
Gum Arabic prices are encouraging	Yes	99.0
	No	01.0
Increase in income	Yes	99.0
	No	01.0

### Distribution of producers' information on the unwillingness and capacity of traders to purchase, and the impact of abolishing concession:

Table (8) indicates the problems that faced gum Arabic producers during the concessionary stage. They faced the unwillingness of traders to purchase gum despite large supplied quantities. The supplied quantities were sometimes beyond the capacity of traders to purchase due to a shortage of liquidity. With the removal of the concessionary system in 2009, all interviewed producers confirmed that traders did not have an objection to purchasing gum Arabic when displayed in the different markets. Similarly, almost all gum producers confirmed that the traders had not refused to buy from the producers due to a shortage of liquidity. The interviewed producers assured that there was no negative impact on gum Arabic production operations.

**Table 8.** Distribution of producers' information on the unwillingness and capacity of traders to purchase and the negative impact of abolishing concession

Variable	Indicator	%
Traders unwilling to purchase displayed gum product	Does not exist	100.0
Traders' capacity to purchase gum Arabic due to shortage in liquidity	Exists	01.0
Negative impact of abolishing concession on gum production	Does not exist	99.0
	Found	12.0
	Not Found	88.0

### Distribution of producers' information on cutting and conservation of gum trees and preference system for gum marketing:

In Table (9) during the concessionary stage producers used to cut down the *Hashab* tree as it was unprofitable to produce gum. They allocated the land for cultivating field crops and producing charcoal. During the free-trade situation almost all of the producers declared that they stopped cutting the trees completely. In contrast, the producers substituted the cutting trees with the conservation of *Hashab* trees and reforestation due to price incentives. This activity was seen in all producing areas in the study area. The producers in Ennuhod and Elkhwai localities come to the Forest National Corporation (FNC) demanding *Hashab* seeds and seedlings. The rehabilitation of *Hashab* forest project in Sheikan locality started in many Gum Arabic producing villages such Botti, Um jumod and Elhimera in previous year. The free-trade policy assisted in resolving the main problems that faced the gum producers. In Ennuhod locality one of the old producers stated that when in the orchard they do not tie their donkeys to the small growing shrubs of *Hashab* trees to avoid damaging or pulling out the growing trees. This indicates the producers' awareness about tree conservation in their orchards. Almost all the producers preferred the free-trade system to the concession ones.

**Table 9.** Distribution of producers' opinions on cutting, conservation of gum trees and preference system for gum marketing

Variable	Indicator	Valid percent
Continued cutting of gum trees	Continued	03.0
	Stopped	97.0
Continued conservation of gum trees	Found	98.0
	Not found	02.0
Preference for concession or free trade gum Arabic marketing policy	Free trade	97.0
	Concession	03.0

### CONCLUSIONS AND RECOMMENDATIONS:

Gum Arabic product remains the major and important commodity of all non-wood forest products and of the main cash crops in Sudan. It has plenty of socio-economical, commercial and environmental benefits. It plays an economic role in the economy, in terms of income source for more than five million Sudanese households, and foreign currency earnings. The policies of gum Arabic marketing witnessed many changes since the colonial era. The production of gum Arabic was led by foreign marketing, in the beginning and then turned to national marketing under the concession era, and now is liberated. The gum Arabic sector in Sudan witnessed a revival and development in production, aspects. The free-trade policy declarations embodied It was apparent the real price of gum products and hence encouraged the producers to increase gum production and conserve the *Hashab* tree. The preference of the producers the free-trade policy to the concession, this confirmed by the traders did not have objection to purchasing gum Arabic when displayed in the different markets and also explained traders had not refused to purchase because of shortage of liquidity. The producers got the rewarding share of 49% of FOB price of gum Arabic against GAC, (4% - 18 % of FOB price). Most of the revenue was monopolized by the company. The private sector was able and ready to finance regularly the purchase of supplied gum into the market. Moreover, some partnerships have been developed between exporting companies and producers to finance gum producers in the tapping period. The producers confirmed the absence of negative impacts on gum production or marketing that resulted from the abolishment of the GAC concession. The study recommended continuing the free-trade policy in the production and marketing of gum Arabic commodities, involving the private sector to provide credit to the gum Arabic producers to expand their gum production area. Improve infrastructure and basic services in the gum Arabic production areas. Establish border trade in gum Arabic. Observe gum Arabic quality across the different value chain points.

### CONFLICT OF INTEREST

The author here declares that there is no conflict of interest in the publication of this article.

### REFERENCES

- Abu-Ali, A. Abdelmajid 2011. Economics of gum Arabic production and marketing in Elgadarif State – Sudan PhD thesis –Department of Agricultural Economics- Faculty of Agriculture-University of Khartoum.
- Adam, H. E. 2011. Integration of remote sensing and GIS in studying vegetation trends and conditions in the *Gum Arabic* belt in North Kordofan, Sudan, PhD thesis Berliner Verlag, Germany, ISBN 978-3-941216-58-7.
- Adam, Hassan, E., Muneer E. S. Eltahir, Mohamed T. Elhaja, Osman E. A. Abdelkareem, Zeinab M.

- Hammad, Awad Elkarim S. Khalifa, Tarig E. Mahmoud, Mohamed E. O. Elsayed, Hatim M. A., Elamin, Mohamed E.Taha, Abdelateif H. Ibrahim 2016. Management of Gum Arabic Production Potentialities in the Gum Belt, Kordofan.
- Anderson, D.M.W. 1993. Some Factors Influencing the Demand for gum Arabic (*Acacia senegal* (L) Willd.) and other Water-soluble Tree Exudates. *Forest Ecology and Management* **58**: 1-18.
- Badi, K.H., Ahmed A.E.H. and Bayoumi A.A.M.S. 1989. The Forests of the Sudan. Agricultural Research Council, Khartoum, Sudan, 184 pp.
- EL-Bashir, H. 1999. Social Structure, Ethnic Relations and Land Tenure Systems in Rura Sheikan Province. Consultant Report Produced for ADS, El-obeid, Sudan.
- Elkhidir, E. E. 2003. Economic Efficiency of Sharecropping in Drylands: A case Study of gum Arabic Production in Kordofan Gum Belt, Sudan. Ph.D. Thesis, University of Putra Malaysia, Malaysia.
- GAC. "Gum Arabic Company" 2000. Recent indicators for gum Arabic production. A study conducted by GAC research Unit, Khartoum, Sudan.
- Habish E. M. 2012. the Determinants of the Gum Arabic Producers Participation in the Gum Industry of Sudan PhD thesis Dept. of Agricultural Economics, University of Baheri- Khartoum Baheri- Sudan.
- Hassan, M. O. 2008. Assessment of Gum Arabic Marketing System in Main Auction Markets of North Kordofan, M.Sc. Thesis University of Khartoum- Sudan.
- Ibrahim, A. H. 2013. Impact of Microcredit on Poverty Alleviation in Rural Sudan: An Applied Modeling Approach in North Kordofan, Central-west Sudan PhD thesis Dept. of Agricultural Economics and Social Sciences in the Tropics and Subtropics, University of Hohenheim, Germany.
- Okoro, C. 2011: Gum Arabic production and marketing in Nigeria. Nigeria Economic Summit Group NESG, Agricultural summit, pp.60-36.
- Olsson, L. 1993. On the causes of famine-drought, desertification and market failure in the Sudan. *Ambio* **22**: 395-403
- Seif el Din, A.G. and Zarroug M. 1996. Production and commercialization of gum Arabic in Sudan. In: FAO (eds), Re-port of the International Expert Consultation on Non-Wood Forest Products: Yogyakarta, Indonesia, 17-27 January 1995. Food and Agricultural Organization, Rome, Italy, pp.465, 1-7.
- Taha, M. E. 2006. The Socio-economic role of *Acacia senegal* in sustainable development of rural areas in the gum belt of the Sudan, ISBN 3-9809816-6-6.
- Taha, M. N. 2000. The Socio-Economic Role of *Acacia senegal* in Sustainable Development of Rural Areas in the Gum Belt of the Sudan. PhD Dissertation, Institute of International Forestry and Forest Products, Technical University of Dresden, Germany.
- Wuranti, Valla 2010. Resource use Efficiency in gum Arabic production among farmers in Yobe State, Nigeria Kogi State University, Anyigba, Kogi State, Nigeria -International Journal of Food and Agricultural Economics ISSN 2147-8988 Vol. 2 No. 1 pp. 77-84 77.

**Citation:** Hassan, M.O.; Salih, A.A.; Ibrahim, E.I; Eltahir, M.E.S.; Alhabeeb, H.E. and Amassaib, M. A. 2024. Gum Arabic Producers' Opinions and Views towards Gum Arabic Marketing Policies-and Strategies, Sudan. *International Journal of Agricultural and Applied Sciences*, 5(1): 16-22.  
<https://doi.org/10.52804/ijaas2024.514>

**Copyright:** © Hassan et. al. 2024. Creative Commons Attribution 4.0 International License. IJAAS allows unrestricted use, reproduction, and distribution of this article in any medium by providing adequate credit to the author(s) and the source of publication.