

REVERSING THE TIDE OF EMPTY CALORIES: LESSONS FROM LOCAL FOOD SYSTEMS IN GWADABAWA RIBAT

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Abstract

The proliferation of empty calories, characterized by high sugar, salt, and fat content, poses significant health risks, particularly among young people. This paper examines the factors contributing to the popularity of empty calories and their detrimental health effects. Drawing on the local food systems of Gwadabawa Ribat in Sokoto Caliphate, Nigeria, this research highlights the importance of traditional farming practices, crop rotation, and organic manuring in promoting healthy food consumption. The paper argues that adopting local food systems and adhering to Islamic dietary guidelines can mitigate the risks associated with empty calories and promote sustainable health outcomes. The study's findings have implications for policymakers, healthcare professionals, and individuals seeking to adopt healthier dietary habits.

Keywords:

Empty calories, cancer, diabetes, local foods, vegetables, cereals, Sokoto Caliphate, Gwadabawa Ribat.

Introduction

Modern diets are the empty calories, very prevalent, accessible, but very dangerous to health, they are mostly synthetic chemicals stuffs (Bhagyalakshmi et al., 2022). Empty calories are stuffs high in energy, sugar or salt or fat, or combinations (of sugars, fats, salt, and preservatives). The other dismay of empty calories is they contain little or no nutrients (such as minerals, vitamins, better energy sources) needed by the body for health and growth or development (Abonmai et al., 2023; Lane et al., 2024). The empty calories do not contain nutrients needed by the body to grow, heal, and developed and stay healthy. These kind of foodstuffs are of poor dietetic value; they are only containing congested amount of sugars, solid fats, preservatives, salt, etc that are eliciting chronic diseases causing injuries, and premature deaths (Arimond et al., 2021; Collado-Soler et al., 2023). Other names for empty calories include, fast foods, junk foods, ultra-processed foods, etc. Intake of empty calories is an unhealthy dietary pattern, and it is encouraged by factors such as presence of these empty calories almost in all stores, and markets, and the humans are inherently loving tasty stuffs (Hamish & Angus, 2019; Islam, 2020). Empty calories are manufactured with zeal to elicit stimulus that will instigate the reward system of the brain, so that the consumers demand more for the past palatable experience (of sweet, salty, umami, for example) (Berkley, 2023; Annam et al., 2024).

The world today is adapting a system whereby stuffs are consumed as foods despite their plainly displayed and reported health effects on many people among the societies. Health effects as a result of high prevalence of empty calories consumption in the society include, obesity, diabetes, food poisoning, cardiovascular problems, arthritis, behavior change, poor reproductive health, overall poor health (Khalid et al., 2020; Harris et al., 2023). Current trend of empty calories consumption has to be addressed, through raising awareness, imparting knowledge to all and sundry, so that better measures to curb this bad trend are taken. The individuals are expected to act positively if they have good awareness, and the policy makers are expected to be elicited by awareness to engage in making decisions guarding the health and life of the citizens for a better and sustainable future (Elbastawy et al., 2021; Mursyida et al., 2022; Jack, 2023; Jega et al., 2024).

Therefore, religion needs to step-in to help the society to address the menace of poor nutrition or empty calories effects. Religion is now recognized scientifically as a medium of intervention to facilitate health and determinants. Sokoto Caliphate is a 19th century area led by the Shehu Usmanu Danfodiyo and his people, as well as descendants, therewith, the religion of Islam is the culture and way of life of the people in the area (Labbo, 2016; Bunza & Karim, 2021). Prosperous utilization of the advantages of Sokoto Caliphate legacies would surely benefit the contemporary societies in terms of social, health, economic, and other dimensions of human life (Bala, 2014; Abba et al., 2017; Gidadawa et al., 2023). Among the core cultures perpetrated by the Sokoto Caliphate was the stationing of *Ribats*, security posts sandwiching the Caliphate to provide fortress, resettlement, food security, and scholastic benefits among others (Abba et al., 2017; Abdulqadir et al., 2022). Allah (SWT) encourages the Muslims for engaging in *Da'wah*, in the following:

“You are the best of peoples ever raised up for mankind, you exhort what is good (*Al-Ma'ruf*) and forbid evil (*Al-Munkar*) and you believe in Allah. Had the people of the book believed, it could have been better for them, among them are believers, but most of them are *fasiqun* (transgressors).”
Qur'an, 3:110

The Gwadabawa *Ribat* is located in the Sokoto Rima River Basin, basically having two geological aspects of bushes, possessing a river that is traversing via the Kalmalo, Amarawa. Other areas having a passage of water or lakes in the *Ribat* include, Huchi, Gwadabawa, Chimmola, Tafkin Kwato, etc, but the Fadama area is traversing the area greatly for example, from Gwadabawa Town moving Northwestern part towards Konni (through Gigane, Damba, etc) the area is a fertile field (Ummaru, 1998). However, the area usually practices two systems of farming, the wet and dry framing, according to rainy season, and dry season (Atiku et al., 2011; Sarkingobir et al., 2021). The presence of sedimentary rocks in the region allows storage of water in the soil course, facilitating use of hand-dug wells to draw water for domestic and irrigation farming activities (Ayama, 2018).

The modes of farming include, personal farm (whereby a household own a field that is cultivated at least once yearly), the *Gandun Sarki* (the state owned farm, which is farmed by the citizens to support the state or for personal gain), and a situation whereby people are hired to farm for money for the privileged people. Mostly, factors facilitating agriculture or farming in the region include, availability of land, availability of manpower, and manure. The soil is enriched with the intervention of poultry, livestock, and plant-based manuring. The harmonious relationship between the crop cultivators and livestock keepers ensured a good development, whereby the rearers roam about to consume pasture or remnants of harvested crops, and in turn releasing the manure for the benefit of the farmers. Mostly, the major crops cultivated include, millet, Janjari, guinea corn, beans, okra, potato, cassava, maize, sugarcane, pumpkin, benieseed for instance. Some cash crops include, potatoes, pepper, cassava, sugar cane, rice, and carrot among others. Other important crops produced in the Gwadabawa *Ribat* include, shea butter, *Goriba*, *Gwandar Daji*, *Kurna*, *Sabara*, desert date, etc (Chafe, 1992). The objective of this paper is to discuss the important of Gwadabawa *Ribat* in tackling empty calories consumption in contemporary societies, especially among the young people.

1. Empty Calories and Young ones

Like drug abuse, empty calories are excessively taken by many people because factors such as curiosity, fun, addiction, peer pressure, accessibility, marketing, poor awareness, etc. Every child should be provided with food of good nature for growth, health, and development. The various steps along the life of young people are characterized with increased demand for balanced diet, and increased appetite (Vaida, 2013). Vaida (2013) studied prevalence of empty calories in adolescents, and revealed that, Kashmir participants, were elicited into use of empty calories because of flavor, varieties, fast services, and availability. Shamsol & Fisol (2023) disclosed that empty calories are increasingly taken by young ones. Khalid et al. (2021) in their study in Pakistan reported that there is direct linked between empty calories consumption and coronary heart disease in a subject of 395 males. Arya & Mishra (2013) on a reviewed paper, determining the effects of empty calories in adolescents young people show that, excess intake of empty calories spur effects such as diabetes, hypertension, dental caries, obesity; due to intake of stuffs like burgers, pastries, noodles, samosa, chips, potatoes chips, sandwiches, hot dogs. Thus, advocated for the intake of balanced diet, which can be achieved through nutritional counseling intervention. Mageswari et al. (2021) in an Indian survey study among pregnant women, identified that, majority of the participants are unaware of the effects of empty calories. Lalnunthara & Jyoti Kumar (2020) stressed that in a study about awareness of empty calories effects in Mizoram, there is need for creating more awareness about effects of empty calories and poor food consumption. Summarily, empty calories are being taken by young ones and would affect them and societies with effects. It is important to apply religious interventions to create awareness, particularly in Sokoto Caliphate, with citing reference to Gwadabawa *Ribat* advantaged of local foods that are good foods better than empty calories.

2. Empty Calories Brief

Empty calories (ECs) is a name given to the stuffs such as beverages, that are containing added solid fats, or added sugar, or other harmful substances, but contained very minute nutrients, sometimes they contain nothing in terms of nutrients (Mageswari et al., 2021; Meena et al., 2023; Miller, 2024). Stuffs regarded as empty calories include, cakes, pastries, sodas, cheese, ice creams, pizza, sausages, hot dogs, donuts, etc. Added sugars present in empty calories are syrups or sugars incorporated in foods during processing by the, manufacturers; while solid fats are also types of deliberately added fats that exist as solids at room temperature (Jia et al., 2022; Horowlz et al., 2023). However, some natural foods contain solid fats, therefore, they should be taken with caution.

3. Parables Of Stuffs Considered As Empty Calories

There are numerous stuffs that are empty calories and are consumed by people from all age groups, some of the empty calories are listed as follows:

- Candies
- Gums
- White bread, mustard
- Flavored drinks
- Cakes, chocolates, mayonnaise
- Fast foods, junk foods
- Soft drinks
- Alcoholic beverages
- Refined cereals (Sarkingobir et al., 2022; Sarkingobir & Miya, 2024).



Figure 1: Empty calories beverages or soft drinks; Source: Arya & Mishra, (2013)



Figure 2: Typical examples of empty calories; Source: Arya & Mishra, (2013)

4. Parables of Healthy Foods

There are several natural or organic foods in local food systems, such as ones cultivated at Gwadabawa Ribat (Ayama, 2018; Gidadawa et al., 2022ab) that are required to be consumed instead of the harmful processed empty calories stuffs, some of them are enumerated as follows:

- Yams

- Egg white
- Sweet potatoes
- Potato
- Nuts
- Oats
- Fruits
- Brown rice
- Vegetables
- Skinless chicken
- Fish (Islam, 2020; Mahmoud et al., 2021; Abonmai et al., 2022; Aimuson-Quampah et al., 2022; Raouf et al., 2022).

5. Classes of Food Substances

For ensuring growth, health, and development, every human being should consume balanced diet, a diet that contains all classes of foods in the sufficient proportions. It should be a daily meal having grains, cereals, meat, fish, eggs, vegetables, and fruits. A young person (fetus to the adolescence stage) is needing balanced diet more than ever (Aimuson-Quampah et al., 2022). Young ones, pregnant women, and people with certain diseases need balanced diet for proper functioning, health, and if there is lack or shortage of food nutrients, the impacts would be more devastating compared to the counterparts. Humans take certain food substances in order to live and experience growth, and development. The food stuffs are generally classified as proteins, carbohydrates, fats, water, vitamins, and minerals according to scientific knowledge (Nagothi, 2021; Michigan WIC Program, 2022).

Carbohydrates are the major sources of energy to the body, they can also be useful in many arrays of processes in the body. Proteins are kinds of foodstuffs that help the body to grow, they are utilized to make new body tissues and repair the broken tissues (UNICEF, 2019; Saraca & Butnariu, 2020). Other useful properties of proteins include, being parts of enzymes, hormones, signals, etc. Sources of proteins include, meat, eggs, milk, nuts, etc. lipids or fats are types of food stuffs such as oils and fatty acids. They are utilized by the body to provide twice the energy given by carbohydrates, and are parts of some hormones, and vitamins. Meats, groundnuts, castor oil, olive oil, and palm oil are examples of foods providing lipids stuffs for human consumption (Nipun et al., 2017; Michigan WIC Program, 2022; Usman et al., 2022). Minerals are micronutrients needed by the body in small amounts, like their counterparts, vitamins. Minerals are present in red cells, bones, nails, teeth, and muscle. Their physiological roles include, water balance, regular heart-beat, regular energy supply, regular transmission of information, and other metabolic acts. Vitamins are essential nutrients required by our bodies in tiny amounts. Vitamins are partners in building, maintaining, repairing tissues, and regulating of the body processes, the foods contain vitamins include, cereals, fruits, vegetables, etc (UNICEF, 2019; Ratmini et al., 2021; Sarkingobir et al., 2023).

Table 1: Some scientifically recognized food groups and their examples

N	Food group	Example
1	Vegetables	Potatoes, tomatoes, peppers, cabbage, onions, carrots, pumpkin, lettuce, spinach, etc
2	Fruits	Oranges, bananas, grapes, melons, dates, pineapples
3	Milk	Milk, cheese
4	Grains	Sorghum, maize, rice, etc
5	Meat	Eggs, beef, chicken, turkey, seeds, nuts, beans

Reasons for Empty Calories Popularity

Empty calories are frequently consumed nowadays, they are ubiquitous in almost all societies, but the most impacted may be young ones; and that trend is due to some features of empty calories as enumerated below:

Lifestyle changing- Nowadays, people have changed their mode of life, especially in the towns and cities, championing the “sedentary lifestyles” people are very busy, without time to sit and cook local foods especially at homes. Things are made easier, people are very busy, engaging in task, therefore, they are mostly diverted from cooking foods and are up-to the empty calories accumulating lots of energy without dissipating (Rezaei, 2017; Rasheed et al., 2021; Whiteland, 2023; Shankar et al., 2024).

Time factor- many people are always trying to work either at home or outside, people are busy going to schools, everyone in the family is working (the females are emaciated and released outside to work, instead of the housewives roles), thus, no time to cook, and no one to cook, instead use of empty calories is the option available (Vidya et al., 2015; Sheena, 2020).

Advertisement and lobbying- There rampant methods of advertising empty calories to the public especially young ones, therefore, people tend to take these stuffs seriously. Companies selling empty calories are experts in marketing and advertisement of their products, such as the use of social media, use of prominent persons, or celebrities, etc. Thus, public are lobbied to consume empty calories without recourse to their effects. One of the key thing the food companies use is the application of preservatives in empty calories. Preservatives in empty calories are to bring about required texture, color, and taste (palatability) to lure consumers. Humans are naturally in love with good taste, such as sweet, umami, and salty (UNICEF, 2019; Tegmire et al., 2021).

Cost- Many portions of empty calories are sold at cheap price, therefore, the lower the price, the lower the demand (Nayak, 2020).

Increased availability and access- In almost every spot in our environment there are shops (small or big) selling diverse empty calories options, therefore, people are virtually forced to buy them, because oval foods are scarce or expensive (Whiteland, 2023).

6. Why should we have Concern about Empty calories?

Empty calories consumption is a harmful behavior or habit that affect health of individuals and the consequences may affect the whole society (Bhagyalakshmi, et al., 2022). Some of the concerns about empty calories are as follows:

- High fat content- Many empty calories such as pizza, burgers, fried chicken, chips, contain much amount of solid fat that cause overweight, obesity, and heart diseases among others.
- Rich salt Content-Many of the empty calories are extremely rich in salt (sodium), for instance, bread, biscuits, refined cereals, much consumption of salt stimulate high blood pressure disorder, heart attack, stress, and generally lead to much effect on cardiovascular system.
- High sugar content and fats content- Some empty calories are containing two folds of problems, the elevated sugar and elevated solid fat, and in turn cause obesity, overweight, diabetes, heart disease, and other chronic harmful disorders.
- Memory and learning problems- Stuffs rich in sugars and fats affect learning and cause poor learning outcomes

- Behavior Change-Consumption of empty calories spur change in behavior, especially in young people, causing anxiety, irritability, excitability, aggressiveness, addiction, and fatigue (Nayak, 2020; Mukoro et al., 2023; Lane et al., 2024; Miller, 2024; Sarkingobir & Miya, 2024).

7. Policies of Gwadabawa Ribat (Sokoto Caliphate) about Foods Consumption

The best thing is for every person to base food consumption and choices according to the teaching of Islam recorded in the Quran and Sunnah (Lemu, 2005). Therefore, the Sokoto Caliphate based its nutritional guidelines and policies with the conformity and adherence to the sources of Sharia (Liman, 2021; Sarkingobir et al., 2021; Abba et al., 2017; Gidadawa et al., 2023). There are several efforts that are recorded guiding man to food, but the major objective of Islam in that regard is to disconnect the man from any food that is harmful either due to method of consumption, ingredients, and measures of intake, albeit, Shehu Usmanu Danfodiyo in his famous hook (*Ihyau Sunnah wa ikhmadul bid'ah*) related that, there is need for everyone to help in donating food to others, despite the amount of the food donated. This is an act intended to curb food insecurity. Some of the other guidelines about food and drinks stated by the Shehu, according to sources of sharia are as follows:

- Donating of food by the master to his servant, donating food by the leader to his followers
- (Rinsing) washing of mouth with water after drinking (milk)
- Avoiding eating while laying down. This act is a major public health guidance against sedentary lifestyle, which is a risk factor of diabetes, obesity, cancer, heart diseases, etc.
- Covering of food items to maintain sanity and hygiene
- Avoiding food discrimination based gender, because the women (girls) need foods more sometimes according to their state of health or body such as pregnancy, adolescence, etc.
- Forewarning people against food toxicity due to heavy metals or chemicals migration in foods, that is why use of containers that spit chemicals should be done with caution.
- Improper mastication of food is forewarned.
- Eating without providing water in the table (avenue) is disapproved.
- Eating hot goods is disapproved. It encourages chemicals from the containers into the food and cause toxicity.
- Consumption of foods eliciting overweight is disapproved, because it causes chronic disorders, such as diabetes, obesity, heart disease, cancer, etc.
- Food extravagance has been disapproved.
- It is unapproved to spend in foods catastrophically, in such a way that other basic needs are sabotaged. Therefore, the state should provide healthy foods at affordable and accessible prices to all without discrimination. This is called food insecurity. The significance of religion in health, especially in this modern world has been recognized. The lessons from religion are very vital, because people relied and adhere to religious ethics easily (Lemu, 2005; Shareef, 2005).

8. Local Food Systems in Gwadabawa Ribat (of Sokoto Caliphate, Nigeria)

The Almighty Allah revealed that “Say (O Muhammad): “Who has forbidden the adornment with clothes given by Allah, which He has produced for his slaves, and At-tayyibat (all kinds of lawful things) of food?” Say; “They are, in the life of this world, for those who believe, (and) exclusively for them (believers) on the day of resurrection)” Thus We explain the Ayat in detail for people who have knowledge”. Qur’an, 7:32.

Food systems refers to collection of activities, processes, and entities that ensure provision of foods from farm to the mouth. If one of these systems (actors or entities) is poor, the whole arrangement may be

affected and consequently the health, economic, and education of society are affected. In the Sokoto Caliphate, the mother of Gwadabawa *Ribat*, the food systems consist of steps, acts, processes, and activities, but generally the principal component of food systems is the agriculture. Agriculture is the easiest way of yielding food to humans. It is a sustainable, permanent, vital, economic, renewable, job-creation, and natural way of supplying food and other benefits to humans and other organism (for instance, animals) (Ayama, 2018). In Gwadabawa *Ribat* the factors supporting agriculture are diverse, some of them are:

- Presence of good comparative climate
- Presence of relief lowlands for drops such as wheat, cereals, fruits, vegetables, etc'
- Presence of good comparative soil (sandy, loamy, and clayey)
- Presence of organic matter (leaves, plants, organisms) that increases soil fertility
- Presence of labour due to high population of the people living in the area (Gada, Illela, Gwadbawa, Tangaza, and Gudu)
- Presence of market due to the large population, and borders (Abba et al., 2017; Ayama et al., 2018).

9. Farming Methods at Gwadabawa *Ribat* that Produce Good Food Systems

Allah SWT disclosed that

“Eat and pasture your cattle (therein): verily, in this are Ayat (proofs and signs) for men of understanding” Quran, 20:54.

“And the earth We have spread out, and have placed therein firm mountains, and caused to grow therein all kinds of things in due proportion” Qur’an, 15:19.

“The vegetation of a good land comes forth (easily) by the Permission of its Lord” Qur’an, 7:58.

In the Gwadabawa *Ribat*, there are some techniques utilized to enhance farming, they include:

- Shifting cultivation- Owing to the availability of vast land, the people in the area are in the habit of leaving their former cultivated lands and moving to another field, allowing the old field to regenerate over several years of fallow.
- Crop rotation- Crop rotation is a method that allows several crops cultivated in a field without using much depletion of nutrients. This involved growing crops in succession over the years on the same land. For instance, rotating potatoes, wheat, and groundnuts in three years.
- Controlled grazing- The use of animals to graze on land is useful, because it clears the grasses, weeds, increase the rate of decomposition of the remnants of harvested crops, and also provide manure (rich, cheap, and sustainable fertilizer) from the animal dung and urine.
- Afforestation- This is an act of planting forest crops, encouraging several plantations. In the Gwadabawa *Ribat* area, there are several forest regions that are useful for environmental protection (against climate change, drought, erosion, desertification encroachment, biodiversity decline); and help to produce foods (such as fruits).
- Irrigation-Irrigation is a man-made method of supplying water to farms, as a bedrock of dry farming activities. Considering the semi-desert nature of the area contribute to wet (rainy season) farming, but during the dry season irrigation is paramount. In Gwadabawa, there are diverse choices of irrigation methods to support growing of local foods that in turn support health, economy, etc. Basin irrigation is local method, therewith, the flow of the water during rainy season is retained in fields due to efforts such as banking. This is practiced in Gwadabawa, Damba,

Tangaza, Kwato, etc. There is also canal irrigation, that involves constructing a dam that serve as reservoir for water, that is released during the needed time to feed farms using canals, this has been done in places like Salame, Gwadabawa, Chimmola, etc. Tanks irrigation offer the use of mud to form local tanks for storing water that is utilized for farming bids in fields. Well irrigation involves hand-dug wells that are utilized in Fadama areas to feed the farms, such as at Kalmalo, Amarawa, Gwadabawa, Asara, Tungar Madugu, Gigane, Damba, Lukuwa, etc. This is very useful when the lake or river water is going down or has dried-off.

- Manuring methods- In Sokoto Caliphate, particularly, the Gwadabawa *Ribat*, there is abundance supply of manure. The manure is obtained from two-folds, namely, the animals (cattle, camel, sheep, goats, etc); and the type of fertilizer made by instigating the composting of plant-based remnants (leaves, stalks, roots, shoots, etc) (Chafe, 1992; Umbaru, 1999; Ayama, 2018).

10. Types of Agriculture in Gwadabawa *Ribat*

The factors influencing agriculture encourages its division into types. Extensive agriculture is a practice of agriculture characterized with farming vast or extensive land using mono-cropping or mixed cropping (Umbaru, 1999; Shuaibu et al., 2024). The most important people that practice this farming are wealthy, families, and officials of government; because it requires large land, and manpower. So the state officials, the people with large family (households), and rich mostly practice it due to their capacity to achieve goals. This form of farming gives large yield, job, and crops to eat and sell in turn help in improving nutrition status (food security of individuals and the land/ state), economic status (fighting joblessness or poverty) and foreign exchange. The state-owned fields are covered by the inhabitants and are mainly to produce foods that are stored by the leader Muhammad Maiturare or his representative (village head and district heads), the purpose of these state stored products is to disseminate to the needy (poor) citizens during the dry season when foods are scarce or expensive, to buy weapons for security purposes, to build infrastructures, and carry out other related functions. Some of the state-owned lands are given freely to some citizens to farm and cater for their families, while some are reserved for pasture, and demarcation, for animals to feed and wallow without disturbing the crops of the general populace. Every person coming from another region to Gwadabawa *Ribat* is given a land for house, and a land for farming, therefore, the more the number, the more the number of farms (Umbaru, 1999). Homestead farming is a form of farming practiced that is mostly controlled by family of few or family head, therefore, it mostly provides foods (crops) for eating (nutrition), and few remains for selling (economic benefits). Agricultural crops in Gwadabawa may be divided as cereals, beverages, fibers, and raw materials. Cereals include, maize, millet, sorghum, wheat, rice, etc. Beverages include, tea, coffee, and cocoa; fibers include, cotton, silk, wool, etc; and raw materials include, cane sugar, fruits, vegetables, etc. The methods of farming also include the use of hoe, ridgers, cutlass, camel, cattle to farm (Chafe, 1992; Ayama, 2018; Chichon et al., 2021).

11. Livestock farming in Gwadabawa *Ribat*

The livestock farming is defined as the process of keeping and as well harvesting of domesticated and semi-domesticated animals for various purposes such as foods, raw materials, manure, aesthetic, and religious reason (Umbaru, 1999). This method keeps cattle, goats, sheep, camel, donkeys, horses, poultry (chickens, fowls, turkeys, and geese among others). The foods made from livestock include, skin, milk, meat, eggs; while raw materials such as hides, skin, wools, hair, bones, manure, are obtained through livestock keeping (Chafe, 1992; Abba et al., 2017).

12. Conclusion

In conclusion, the local food systems in Gwadabawa *Ribat*, Sokoto Caliphate, Nigeria, offer valuable lessons in promoting healthy eating habits and reducing the consumption of empty calories. The traditional farming practices, crop diversity, and emphasis on local food consumption in Gwadabawa *Ribat* provide

a model for sustainable food systems that prioritize nutritional value and community well-being. By adopting these practices and promoting awareness about the risks associated with empty calories, we can mitigate the rising tide of diet-related health problems among young people. Ultimately, a return to traditional, locally-based food systems like those found in Gwadabawa *Ribat* may hold the key to creating a healthier, more sustainable food future.

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