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A Note about 'Foulgo' Salt Processing and its Role in the Livelihood of Dwelling People in Gabal Marra

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Abstract: The aim of this note was to outline the processing of a table-salt, locally known as "Foulgo salt" in Gabal Marra area, and highlighting its socio-economic impact on the livelihood of the mountain dwellers. Salt samples were procured from a local producer and were chemically analyzed in the laboratory of the Soil and Environmental Sciences Department, Faculty of Agriculture, University of Khartoum in August 2020. The preparation steps include: impregnation of soil by salt in the farm, collection and percolation of the soil and evaporation of the solute at home and yield of the salt. The salt is grey to pale brown in colour and has small crystals and readily dissolves in water. The salt is composed of 78.9% NaCl, 0.5 % Ca, 0.78 % Mg and traces of K. Its Ec is 19.97dS/m and TDS of 1280.8 ppm. The salt is used for human consumption and for various purposes. It is sold to get income and historically it was used for trade both as commodity and exchange currency. The salt is still produced at small scale, and its production is anticipated to continue for some time in response to the prevailing local demand.

Keywords: Foulgo Salt; Processing; Socioeconomic Impact.

A table salt is mainly composed of sodium chloride (NaCl), which is a mineral naturally found in a crystalline form, and known as rock salt or halite. It is present in huge quantities in seawater, with a concentration of about 350 g/l and salinity of 3.5 % (https://en.wikipedia.org). Salt is processed from salt mines or by the evaporation of seawater and by boiling of saline water (Hansen 2018). Its colour is white but may be tainted by impurities and thus is coloured pink, red, black lava, grey,

(Harrison 2018; Helmenstine 2019). It is 78 to 97 % NaCl(Helmenstine2019; Wood2020). Natural salt contains a variety of chemicals. When it is processed into table salt, it may also contain some additives *e.g*. iodine, fluoride, iron, folic acid (vitamin B9), anti-caking agents. It is one of very old known food ingredients of human beings, perhaps from immemorial times, and in very wide areas globally. Evidence indicates that prehistoric nations (Chinese, Greeks, Romans, Egyptians, Indians); around 6,000 BC processed and utilized some sorts of salts. It is used for multiple purposes, as human food, animal feed, food preservation (especially meat), detergent and medicine for curing many diseases, for exchange or currency for goods and services. Salt also symbolizes credibility between people as matter of trust particularly in the Arab culture. Great salt mining and trade flourished in western Africa during 1000-1700 centuries and salt was pretty cherished to the extent that it was exchanged with gold volume by volume (McDougall 1990).

In Gabal Marra, Darfur, at Fur homestead, people process and utilize a certain table salt which they named "Foulgo salt". In opposition, on the contrary they name the salt prepared from seawater as "Zagoom salt" (the food of the devil in the Hell).

In Gabal Marra, there are numerous springs and water courses radiating from the mountain highlands, some of them have potable water and others have saline or hard water. Also, there are many volcanic ash deposits; and where these deposits are traversed by springs and rivers they irreversibly consolidate into hardpans, a phenomenon that occurs in Andosols developing on volcanic ash (Fitzpatrick 1983). These hardpans of volcanic ash deposits are also formed when water oozes from the hillsides by lateral flows; and they are permanently kept wet by this process.

Traditionally local people create and own salt farms along the rivers with saline water and consolidated hardpans of the earth. The salt farms are small patches of areas about 10 to 50 m^2. They are considered like assets or properties that can be sold, hired, donated and passed over through heritage. The work on these farms and the salt processing is dominated by women and children. It is mainly carried out during the off-work periods in the afternoons, and after carrying out house duties and executing the works in farms, orchards or animal rearing in the mornings.

The salt processing begins by bringing dry soil from nearby areas and spreading it on the salt farms uniformly and then leaving it for a week or

so during which period the soil will absorb the saline water and be soaked by the salt. Then after that, the salt-soaked soil is collected and packed in ceramic bowels held over three stone pillars similar to that of making fire for cooking. The ceramic bowels measure about 50 cm in the opening and around 40 cm deep (Plate 1). They are pierced with three holes at their bottom, and before packing with the salted soil the holes are covered by a filter made from fibres of some herbs growing along the rivers and by the site of the salt farms. The salted soil is packed to about three quarters the height of the ceramic bowel. Then the empty upper quarter of the bowel is filled with water taken from the river or nearby spring. A PVC container (previously was a ceramic pot) is inserted in between the stone pillars under the ceramic bowel opposite to the holes to collect the salt percolates. The percolation operation takes about half an hour and it is repeated for 3-4 times until all the soaked salt is washed. The percolates are mixed together and taken home. The washed soil is discarded and the bowel is cleaned for another round of salt-water collection. At home, and before going to bed, the salt water is boiled and evaporated to consolidate a residue, which is named the Foulgo salt. The Foulgo salt is shaped into cylindrical or conical forms, called heads which weigh about 1 kg; and left to dry in place on a sheet of spreaded ash. In most cases Foulgo salt processing is carried out in a separate cottage that is also used as store for other crops and commodities.

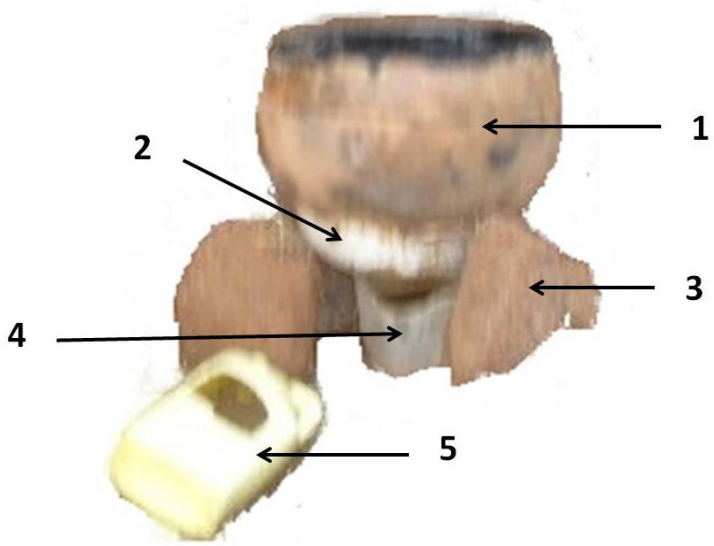

Plate 1.Traditional apparatus for Extracting Foulgo Brine; showing: A Ceramic Bowel-Shaped Container Filled with Salted Soil (1), Mounted on a Support (2) and 3 Stone pillars (3) and Underlain with a Plastic Container for Collecting the Salted Percolates (4) and Transport Container (5).

The color of Foulgo salt may range from whitish grey to pale brown dry depending on the soil and water used for extraction, and perhaps the contents of other salts and mineral elements. The evaporation residue is like a pulverized material apparently without coherence and a definite structure. Plate 2 illustrates these features and in comparison with table salt of sea origin, which is whiter in color and with larger crystals. Even though, small to medium size crystals can be recognized and be seen obviously, when rubbed between the fingers a coarse texture sense is felt. The Foulgo salt dissolves completely in water without leaving impurities and suspended solid emulsions.

A **B**

Plate 2. Comparison between features of Foulgo salt (A) and table salt (B) of sea origin

The chemical analysis of Foulgo salt showed that it is mainly composed of NaCl with content of 78.9 %; the individual contents of Na and Cl are 18.5 % and 47.9 %, respectively. The other elements contents were 0.5 Ca; 0.78 % Mg; 0.0002% K and 0.01 % P. Its salinity measure, *i.e.* Ec, was about 20 dS/m; meanwhile its contents of TDS are about 1280.8 ppm. The Foulgo salt production and its utilization are probably as old as ever since the Fur tribes and their ancestors dwelled in Gabal Marra. Large quantities were produced to meet local demand and with surpluses for trade. Locally the salt is mainly consumed as food ingredient in making the sauces and other stews; it is also used in preservation of many types of food materials of which Darfur is particularly famous. The salt is mixed with animal feed specially that of livestock and poultry. It is used as preventive stuff and a medicine for curing many diseases. It ought to have been a stuff of cultural prestige which could not be tasted except by nobles and high ranking people in the ancient societies. Besides, it could have spiritual and traditional believes ceremonies, which might be

guessed from the naming of sea salt as “Zagoom”, with a connotation of being the food of the devil in the Hell.

On the other hand, the commerce of Foulgo salt has been widely spreading in the surroundings of the Greater Darfur regions, extending to kingdoms in Chad, Libya, South Sudan, the River Nile and tributaries. It was transported and distributed to the mentioned surroundings by donkeys and elderly men still narrating the memories of their journeys to those distant regions. The Foulgo trade in the ancient times was mainly practiced on commodity exchange basis. It was exchanged for cloths, jewelleries, cereals, spices…etc. It is thus, obvious that Foulgo salt has played very important role in the livelihood and social status of Gabal Marra people in the past, even though it is still being produced and consumed at limited scale at local levels.

It is worth to mention that, the procedures of Foulgo salt production as it has been practiced in the Fur homestead at Gabal Marra, has probably no match elsewhere even though some sort of salt extraction from saline water is said to be practiced in Baow area, Blue Nile State, mainly by dwellers migrated from Darfur region (Personal Communication). The operations followed in preparation of soaked soil by salt, its extraction and evaporation of the saline water to consolidate the salt residue have very much similitude to some modern day chemical analysis that are carried out in factories. Besides, it worth to appreciate the special skills revealed by the women all along the processing operations of Foulgo salt and to produce a very high quality product closer to that prepared by the modern methods.

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نبذة عن تصنيع ملح الفلقو و دوره في سبل كسب العيش لسكان جبل مرة

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المستخلص: هدفت هذه الدراسة الي تبيان عملية صناعة ملح للإستهلاك الآدمي في جبل مرة و الذي يعرف بملح الفلقو؛ و إظهار الدور الإجتماعي–الإقتصادي لهذا الملح في كسب العيش و الرفاه لدي ساكني الجبل. تم الحصول علي عينات ملح من صانعة محلية و تم تحليلها كيميائياً في معمل قسم علوم التربة و البيئة، كلية الزراعة، جامعة الخرطوم في أغسطس 2020م. خطوات إنتاج الملح تشمل: تشرب التربة بالملح في مزرعة الملح؛ جمع التربة المالحة و إستخلاص الملح عن طريق تسريب الماء و جمع ماء الملح و من ثم تبخير الماء المالح عن طريق الغلي في المنزل و إنتاج الملح. الملح المنتج لونه رمادي الي بني فاتح و ذو بلورات صغيرة و يذوب سريعاً في الماء. يتكون الملح من NaCl 78.9%؛ يحتوي Ca 0.5 %؛ Mg 0.78 %؛ و آثار من K. يبلغ ال Ec له 19.97 dS/m و TDS 1280.8 ppm. يستعمل الملح للإستهلاك الآدمي و لأغراض متعددة. و هو يباع لجلب دخل مادي و تاريخياً أستعمل في التجارة كسلعة و عملة للتبادل السلعي. لا يزال الملح ينتج بكميات محدودة و لكن من المتوقع إستمرار إنتاجه لمدي من الزمن نتيجة لتواجد طلب محلي له.

كلمات مفتاحية: ملح الفلقو؛ أهمية إجتماعية–إقتصادية، جبل مرة.