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ART, TECHNOLOGY AND ECONOMY OF BUTH JO DARO

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Abstract
From an archaeological perspective, this study investigates the socio-economic development of the Buth jo Daro site, a significant transitional settlement situated between Balochistan and Sindh. Spanning from the Early to the Mature Indus period, Buth jo Daro emerges as a vital node in the broader Indus Civilization. Through stratigraphic excavation, artifact analysis, and spatial mapping, the research identifies key factors—such as technological advancement, artisanal production, and systems of equitable resource distribution—that contributed to the site's growth. Excavations revealed evidence of craft industries, standardized weights, storage facilities, and long-distance trade goods, all pointing toward an organized and investor-friendly economic structure. The results suggest that the fair redistribution of resources enabled both local and external investment, promoting stable socio-economic conditions. These dynamics not only enhanced internal cohesion but also allowed Indus traders to expand economic activities beyond regional boundaries, affirming Buth jo Daro's role as a critical center in the Indus trade and administrative network.

INTRODUCTION

The site Buth jo Daro is located in district Jamshoro; 65 kilometers away, from the district Headquarter of Jamshoro in Taluka Manjhand, on Jamshoro-Sehwan Indus highway (NH-5). The site was accidentally discovered during the digging of Right Bank Outfall Drain (RBOD) aimed to out drain the chemical wastes of industries. The cultural material of Buth jo Daro site is laying in-between the RBOD and NH-5 in the form of huge mounds full of artefacts, remaining excavated site area is irrigated by local dwellers of village and the rest of site is underneath of RBOD. This important site has splendid history from early periods where the basic source of sustaining life was agriculture which was done with the water of river Indus and water drains flown through the mountain valleys of Baluchistan which brought the minerals and sand particles which made lands more fertile for excessive agricultural yield which paved the way for local trade and behind the borders even to Iran. The craftsmen of Butho Daro had mastery over making right ration for making ornaments and bricks, which can be seen in making disc beads, fine gold ornaments and multistory buildings all this is discussed in this research paper.

Architecture at Buth jo Daro

Architectural evidence at Butho Daro is abundant, with the presence of complete and broken burnt bricks on the surface serving as compelling art factual proof of the site's architectural significance. These findings suggest that Buth jo Daro once featured splendid houses and structures, comparable to the

architectural patterns observed at Mohenjo-Daro. At Mohenjo-Daro, bricks in the "L Area" commonly measure 2 x 5.5 inches. At Buth jo Daro, brick sizes exhibit slight variations, likely due to the use of local brick molds. The recorded brick sizes at Buth jo Daro include 2.2 x 4.8 inches, 2.7 x 5.5 inches, 2.3 x 5 inches, and 2.4 x 5.2 inches, with maximum dimensions recorded as 14.6 x 6 cm, 16 x 5.7 cm, 17.5 x 6.7 cm, 22 x 5.7 cm, and 12.5 x 5.3 cm. These variations indicate that the brick makers at Buth jo Daro possessed advanced brick-making techniques tailored for different construction purposes. The bricks used at Mohenjo-Daro are renowned for their strength and durability, which contributed significantly to the site's remarkable architectural legacy. Evidence also suggests that bricks from earlier periods were repurposed in later masonry work, further reinforcing the idea of the durability and reliability of Indus bricks. The most common brick sizes at Mohenjo-Daro include 11 x 5.5 x 2.75 inches, 11.75 x 5.25 x 2.5 inches, and 10.5 x 5.5 x 2.5 inches, highlighting a standardized yet versatile approach to brick production in the Indus Valley Civilization.

Literature review

Yan Y. Dhheansky further highlighted the religious aspects of the Indus Civilization and said that yoga had its roots with this civilization. Later archaeological surveys carried out during the seven-year period between, 1920 and 1930 gave this belief credence. While there are no particular religious' structures attributable to this culture that over 2 500 steatite seals on Proto-Shiva have been found. The findings presented here vindicate the hypothesis that Hindu religion practices can be linked to the Indus civilization. According to C.C. Lamberg-Karlovsky in his work of 1972, trade refers to the process of moving goods or materials by persons or groups. He identified three major categories of trade: Purchases can be divided into categories such as, direct trade, exchange and the central trade activity. He also pointed out that the details of trade between the Indus and Mesopotamia still has not been fully explained. All these plans to directly trade with West Asia are still contentious because transportation costs are rather prohibitive than manufacturing locally. In addition, there were few commonalities of architectural patterns between the two Zones and few, if any, artifacts had been transported between them, obviously meaning that their trade relations were probably indirect or by middlemen. It was described by Rafi U. Sami (2000) in his book Ancient Indus Civilization about Rehman Dheri, located north of Dera Ismail Khan. Archaeological investigations by Peshawar University and CAM-bridge University exposed six strata; the Kot Dijian stratum that has been calibrated through radiocarbon dating to 3340–3240 BCE. Regarding pottery, knobs, pipal leaves motifs, geometrical designs and peacock designs where found within this layer. The samples collected from the upper level of the sequence were assigned to the Mature Indus period. It was also an important centre for bead making and cutting, drilling and polishing beads specific to the period 3340–3160 BCE and a trade mart. Bridget Raymond Allchin (1982) opined that Early cultures in and around Baluchistan and including Zhob, Kulli Quetta and Nal were Path finder's leading towards EH or Early Indus sites. Some of them gradually merged into Sindh and other area cultures. In later years, Allchin supplemented the Early Indus data with artifact-centered investigations of the Early Indus settlements, including Amri, an Early Indus site on the right bank of the Indus River. As Majumdar pointed in 1929, and later Casal did in a more detail Amri contained a range of pottery with monochromic and bi-chromic decorations and an assortment of motifs. Casal also mentioned likelihood of several other Early Indus sites in the same geographical zone.

Method and Raw Material Source

This study employs a multidisciplinary archaeological methodology to examine the socio-economic development of the Buth jo Daro site. Fieldwork included systematic surface surveys and stratigraphic excavations at key sectors of the site to identify settlement patterns, craft areas, and administrative structures. Standard archaeological tools—such as trowels, sieves, and total stations—were used to document stratigraphy and recover material remains. A typological analysis of ceramics, beads, lithic tools, and metallurgical remains was conducted to understand technological capabilities and trade

interactions. In addition to excavation, spatial analysis using technology helped map architectural features, craft production zones, and storage facilities, allowing to infer the site's functional organization. Comparative analysis with contemporary sites in Balochistan and the Indus Valley was undertaken to contextualize Buth jo Daro's role in regional exchange systems. Furthermore, selected samples were subjected to laboratory testing, including compositional analysis to trace the provenance of raw materials. All artifacts were catalogued according to standard archaeological recording protocols and preserved for further research. This integrative approach provided insight into the technological, economic, and administrative infrastructure of Buth jo Daro, enabling a better understanding of the mechanisms that supported local development and interregional connectivity during the Indus Civilization.

Results and Discussion

The excavation and analysis of the Buth jo Daro site yielded substantial evidence reflecting its socio-economic complexity during the Early to Mature Indus periods. Stratigraphic layers revealed continuous occupation, with architectural remains suggesting a planned settlement layout. Mud-brick structures, granaries, and storage pits indicated organized domestic and economic activity, while the presence of wide lanes and working areas pointed to structured urban planning. A diverse range of artifacts was uncovered, including ceramic wares, stone tools, copper objects, beads, and shell ornaments. Pottery typologies corresponded with both local and Indus Valley traditions, indicating cultural blending and trade linkages. The discovery of bread-making debris, unfinished stone tools, and copper slag strongly suggests local craft production and metallurgical activity. These materials reflect not only technological expertise but also participation in broader commercial networks. Standardized weights and scales found at the site point to regulated trade practices, while storage structures suggest surplus management and redistribution mechanisms. The presence of non-local materials—such as marine shells and semi-precious stones—confirms Buth jo Daro's role in interregional trade, likely functioning as a redistribution center between the highlands of Balochistan and the Indus plains.

The materials used in manufacturing small to large artifacts during Indus period were obtained from local as well as the extra-regional areas of the civilization. Some of the materials used in the manufacture of artifacts include rough and fine ware pottery, burnt bricks and any other fabrications including human and animal figurines, and bangles from clays within the region. But other artifacts' raw materials including metals were imported from outside the Indus region such as Afghanistan, Iran and other source regions. Bronze Age civilization developed in riverine zones in the plains and it is usually noted that rivers helped in transportation of metal ores/ minerals etc. Contextual to urbanization (Miller 1995; Kenoyer and Miller 1999; Hoffman and Miller 2014). The existence of extraction of metals in region of South Asia can be dated back to pre-historic period where semi-precious & precious metals copper, lead, gold, silver, zinc, iron and many types of alloys were mentioned in the sacred texts of the post Indus period. Substances of mesal used into the Indus period are numerous and therefore evident testimony of smelting, melting and recycling metals where outlined and described by Mackay 1938; Vats 1940; Rao 1979; Miller 1999; Kenoyer and Miller 1999; Agrawal 2000; Bhan et al. 2002; Hoffman & Miller, 2014.

Metallurgy

Facility at Mehrgarh reveals the first signs of metal usage, an old copper bead buried with a child in a grave (Jarrige, 1985 b; Jarrige and Lechevallier, 1979). Further, during the same excavation of Othman Ji Bithi, a copper chisel was also excavated out of which it was determined that it belonged to the Early Indus period (Majumdar 1934: 224). Indus craftsmen mainly used copper and bronze for this purpose only and by doing so, they pioneered a tradition of making bronze artefacts in the protohistoric phase of Indian sub-continent. The craftsman of the Mature Indus period were highly skilled in the use of metals such as gold, silver copper, lead and tin and antimony. The people of Mohenjo-Daro were highly Mortals in terms of the abilities they possessed with Metallurgy especially in copper, silver, gold and lead. Through practice they

were able to obtain the right proportion of tin needed for the making of bronze but tin was sometime scarce thus restricting them from making bronze. Technetium obtained from adjacent areas was difficult; however, the craftsmen of Mohenjo-Daro were able to make both copper and bronze artefacts. Buth jo Daro itself has very few exhibited metal objects on its surface and hence much of its metallurgical activity requires some digging. These copper utensils unearthed from the surface suggest that the people of Buth jo Daro practitioners of metallurgy. However, the likes of gold and silver have not been identified on the site to this date. The important discoveries included at Mohenjo-Daro were gold which was imported from Central Asia and Southern India and silver imported from Afghanistan, Persia and Burma. A platinum was also an aspect of Indus-made artefacts, which wtelligence of the Indus craftspeople in processes like the separation of lead from silver.

Copper

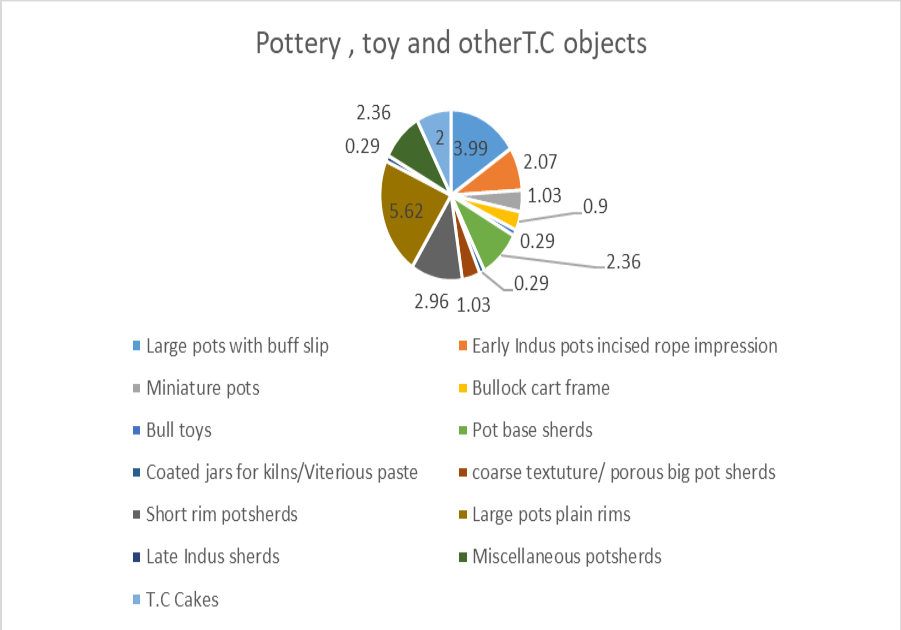
Bronze Age inhabitants of Buth jo Daro were able to metal work, and the finding of a whole copper chisel or knife on the surface of Buth jo Daro supports interaction evidence. The largest copper chisel measure 5.6 cm in length with a thickness of 4mm If the second example, it measures 7.7 cm in width and 10mm in thickness. Copper stood out among the metals; found in most tools and objects such as copper utensils, copper head, copper sickle, copper rings, copper daggers, bangle and amulets, copper knives and copper Celt. Concentrating on copper to manufacture artifacts necessitated use of other metals so as to improve the levels of hardness. How early forgeries of Indus civilization learnt this technique of mixing tin to prepare bronze is unknown whether they invented it on their own or they imported it from other civilizations. Generally, metal products especially pieces of jewelry were made through casting techniques and then by hammering into the required from. These techniques give credence to the assertions that a fairly high level of metallurgical sophistication was present in the people of Buth jo Daro.

Pottery

It can be noted that Buth jo Daro site seems to have been an important centre for pottery making. Many plain and painted pottery fragments add to our samples; large, thick, rough, handmade potsherds; scraped, fine, thin, wheel-made potsherds; varieties of plain and painted potteries with many kinds of decorations and geometric designs. Of all types of rims, inverted and averted rims are especially common. Like most other Harappan sites, the wheel-made pottery dominated the site of Mohenjo-Daro. The earliest records of the use of wheel in pottery making is likely to have been recorded in Elam, Mesopotamia. This made it possible to shape the Mesopotamian wheel while giving the centrifugal motion inside the clay lump and enabling the potter. Although acc to Mohenjo-Daro complete pots are still scanty, the potteries ear then the potsherds are very numerous. When making utilitarian pottery, the Indus potters separately incorporated such items as lime, sand or other unwanted material into the clay. But, if a jar of a specific size or miniature was made, special clay paste was worked without addition of any substance. It would seem that pottery in the Indus Valley was fired in the open and covered with organic fuel debris. Following that, slips or coatings were made on the potter's wheel so that it should be smooth or fill in gaps in case of leakage.

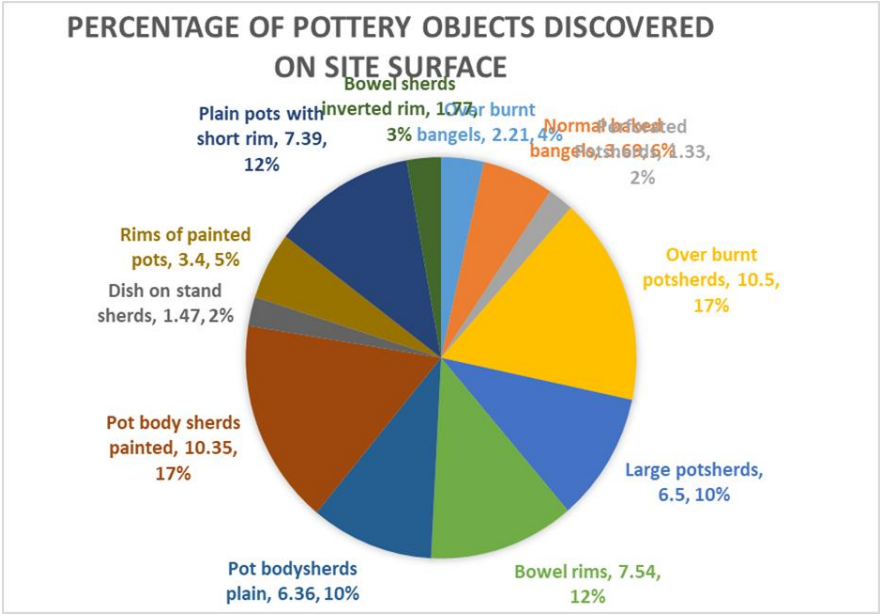
Secondary designs in the form of cord marks or incised lines were made on the pot surface before the pot was fired dried. The decorations engraved on the body of these vessels are very close to the Mesopotamian pottery designs as can be seen from figures 1 to 2.

*(Muhammad Sanuallah, Pp-481)



Source: Researcher/Author

Figure 1. Pottery, Toy and other Terracotta Objects



Source: Researcher/Author

Fig 2: Percentage of Pottery, Toys and Other Terracotta Objects

Stone Artifacts

Mortars and other stone objects dominate the assemblage realized at the Buth jo Daro site, which may indicate highly developed skills of the local people in the manufacture of stone tools. The more abundant forms are flint chart and buff and red varieties of sandstone. The lithic material found in the uncovered area are tools such as blades, scrapers, grinders, weight stones, rounded sandstone pieces and, square sandstone blocks. Such material might have been procured from areas that include Baluchistan and Rohri Hills in particular. A significant number and variety of semi-precious stones have been unearthed at Mohenjo-Daro, showcasing the artisans' skill and the civilization's wide-ranging trade connections. In terms of its origin, lapis lazuli refers to a bright blue stone, this word itself comes from the Persian word lajward which means blue. Lapis lazuli is found in Afghanistan, China, Tibet and Siberia mostly, but the prolific source is known to be Badakhshan. The classical civilization that used lapis lazuli most was the Syrian, Egyptians, Persians and inhabitants of the Indus valley civilization. Turquoise a green blue stone whose origin is from Persia and some parts of central Asia such as Turkestan. Turquoise that was used by the craftsmen of Mohenjo-Daro was imported from regions of Khorasan and Persia. Soapstone, also known as steatite because of its soapy feel, can barely fuse and can be easily shaped into any forms, other than round ones, with heat. Used extensively in Ancient Egypt (It was also imported from the areas of the Indus Civilization in Modern India: Madras, Orissa, Central Provinces and Bihar). There was another mineral employed by Indus craftsmen which was as attractive as cress and this material was amazonite, green feldspar. Its main source regions were India and Kashmir (L.A.S Hemmey).

Stone Weights

At Buth jo Daro, the discovery of round, well-polished stone weights provides evidence of the precision and legacy of the Indus Valley weight system. Limestone balls, including one with a dark red thick dot, are believed to have been used as weights at the site. The basic weight unit appears to be 12 grams (one told), with divisions following a system where 12 is divided into 20 smaller units (see Figures 5.3–5.5). In comparison, the weight stones found at Mohenjo-Daro and Harappa were typically made from chart and gneiss stones. These stones were well-polished and shaped into rectangular or cylindrical forms. They were highly accurate, with weight measurements following an arbitrary unit system based on ratios of 2, 4, and 8, demonstrating the sophistication and standardization of the Indus Valley Civilization's weight system

TABEL I: WEIGHTS AT MOHENJO-DARO

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Designation	No. of Specimens	Mean Weight Observed	Mean deviation	Limits	Ratio.	Calculated Value.	Difference between Cols.3 and 7	Remarks.
N	1	1375 gm.	----	----	1600	1370 gm.	5	One Weight in Class L is a corrected Value.
L	2	272.95	2.25	270.70—275.20	320	273.92	—.97	
K	1	174.5	----	----	200	171.2	3.3	
J	6	135.97	.88	134.59—137.81	160	136.96	—.99	
H	6	54.21	.26	53.81—54.50	64	54.78	—.57	
G	26	27.29	.24	26.85—29.00	32	27.39	—.10	
F	32	13.79	.26	13.49—14.90	16	13.70	.09	= 211.4 g.t.[1]
E	22	6.82	.09	6.31—7.27	8	6.85	—.03	

D	9	3.40	.03	3.24~3.51	4	3.42	~.02	
C	9	2.28	.04	2.24~2.33	1 × 8	2.28	.00	----
B	5	1.77	.06	1.69~1.86	2	1.71	.06	----
A	1	.87	~	~	1	.856	.01	----

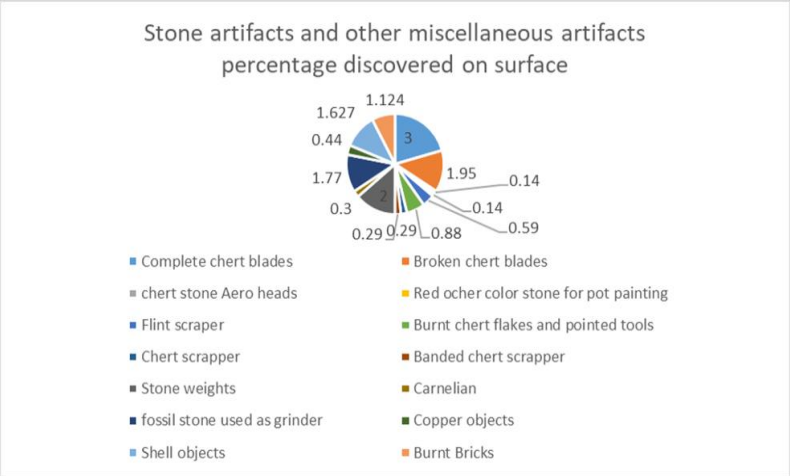
Source: Mohen Jo Daro and Indus Civilization

TABLE 2: WEIGHTS FOUND AT BOTH MOHENJO-DARO AND HARAPPA

(1) Designation	(2) No. of Specimens	(3) Mean Weight Observed	(4) Mean deviation	(5) Limits	(6) Ratio.	(7) Calculated Value.	(8) Difference between Cols.3 and 7	(9) Remarks.
N	2	1375 gm.	----	1375	1600	1371 gm	4	
M	1	546.7	----	----	640	548.5	~1.8	
L	2	272.9	2.25	2070-7 –275-2	320	274.2	~1.3	
K	1	174.5	----	-----	200	171.4	3.1	----
J	7	135.95	.77	134.59—137.81	160	137.1	~.1	----
H	7	54.23	.23	53.81—54.50	64	54.84	~ .61	----
G	39	27.38	.33	26.79—29.00	32	27.42	~ .04	----
F	41	13.81	.26	13.37—14.64	16	13.71	.10	== 211.5g.t
E	26	6.82	.09	6.31—7.27	8	6.86	~ .04	105.8g.t
D	12	3.41	.06	3.24—3.51	4	3.43	~ .02	----
C	2	2.28	.04	2.24—2.33	1 × 82	2.28	.00	== 35.3g.t
B	6	1.76	.06	1.69—1.86	2	1.71	.05	----
A	1	.87	~	-----	1	.857	.01	== 13.2g.t.

Source: Mohen jo Daro and Indus Civilization

Figure 3: Percentage of Stone and Other Miscellaneous Artifacts Discovered On Site Surface,



Source: Researcher/ Author

Shell Objects

Exell and efficient shell artifacts in the IVC were made with Turbinella pyrum shell but, Fasciolaria, Lambis truncata, Trapezium(shell), Tivela(shell) and other species were also used for the purpose of curating of different objects. The source areas for Turbinella pyrum and other species covered west coast comprising of Karachi and Makran. Fasciolaria trapezium and Chicoreus ramosus were imported from the eastern Gulf of Kutch, Khambat, and regions of Oman (Kenoyer, J.M., 2008: Subproject A: Integrated Analysis of the Shell and Carnelian Artifacts in Indus Mesopotamian Trade Networks (New approaches to Indus). At Butho Daro site, a reasonable number of shell artifacts have been found on surface level. These are shell bangles, shell disk beads and fragments of conch shells. These objects were produced from shells that were procured from the Indian Ocean region. The required raw materials were delivered to the site so as to be used to develop the proper shell items. Round beads like Shell bangles are traditionally adored as sacred amulets in Indian rituals; they mostly made from Turbinella pyrum procured from the coastal regions of the Indus valley and modern Sri Lanka. Even today, there are 4–5 million Turbinella pyrum shells imported to Calcutta and Madras to create religious goods. Another shell kind was also mentioned within the Indus area and having been imported from the Persian Gulf was the Fasciolaria trapezium. Pearl oysters, as beautiful as they were, were not employed in craft work by the Indus civilization. Nonetheless, these shells were employed in great measures by Sumerian craftsmen to develop many objects. Mother of pearl particularly originating from the Persian Gulf was also brought into the region. Hundreds of shell remains have been discovered in the "L Area" of Mohenjo-Daro at various locations. You know, beads were made from the columella of shells and the outer walls of these shells were perfect for making shell bangles. Columella was also used in operating more delicate forms of inlaying work, which demanded more skill. The equipments that were used in inlay work were included; small chisel, sharp saw and different shape of drills to polish the side and edges of the materials with ease and high precision.

Ornaments used in Butho Daro

Men and women of the Indus Valley Civilization adorned themselves with equal enthusiasm. Beads strung together were commonly worn, and armlets were often used, particularly by males of the privileged class, as evidenced by statues discovered at various Indus sites. At Mohenjo-Daro, evidence of carnelian beads with distinctive white line patterns has been found.

The people of Buth jo Daro similarly adorned themselves with a variety of ornaments. These included carnelian beads, lapis lazuli, shell bangles, and shell disc beads, reflecting their craftsmanship and the cultural significance of personal adornment in the Indus Civilization.

Conclusion

Carful statistical data is behind the complex development of Buth jo Daro which obviously had greatly contributed overall the economy of Indus civilization. The strategic location of Buth jo Daro also serves as added advantage to the importance of the economy. Baluchistan was not only a supplier of raw material, but also a door to West Asian area. In return, Buth jo Daro's trade links are said to have reached over the Persian Gulf up to the ancient Persia and Mesopotamia, where the cultures intermingled and shared their economic values. The influence of trading with the West Asian and adjacent areas using the Indus River Valley is demonstrative in the sophisticated economic and social setting of Buth jo Daro. That there were more than one pottery production zone, the stone working areas and facilities for processing and painting of artifacts are clear indicator of the site's sustained economy system.

Availability of burnt bricks at Buth jo Daro adds to establishment of better masonry at the site. Similar to Mohenjo-Daro and Harappa, Buth jo Daro's architecture featured houses constructed with burnt bricks, showcasing the community's architectural sophistication. In the entire Indus Valley Civilization, houses constructed with burnt bricks ere very scarce hence becoming a specialty therein.

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