



Cupules in Khirthar, Sindh (Pakistan)

ZULFIQAR ALI KALHORO

Introduction

Cup-marks or cupules are found in every continent except Antarctica. Cupules are the earliest prehistoric rock art and were produced in all three eras —of Stone Age— Palaeolithic, Mesolithic, Neolithic as well as in historical times. They are also found in the Indian Sub-continent. Therefore, the present paper deals with cupules in Khirthar region of Sindh. Khirthar is the major mountain range in Sindh which separates it from Balochistan in the west. There are many valleys in Khirthar range where people still live. The majority of the people in the valleys of Khirthar are engaged in pastoralism and agriculture.

This paper is divided into two parts, the first part presents an overview of cupules in the subcontinent and the second deals with Pakistan in general and Khirthar in particular. While discussing the cupules of Khirthar, attention has been paid to their distribution, description and interpretation.

Cupules

Several studies have been published on the cupules in different countries of the world. Despite a large corpus of literature on cupules, one does not find convincing explanations about their function. Some scholars believe that the majority of these are for non-utilitarian purposes and a very few may be used for utilitarian purposes. Prior to moving further, one needs to define cupules first. According to Bednarik (2008:70), a cupule is a hemispherical percussion petroglyph which may occur on a horizontal or vertical surface. This implies three basic definitional criteria:

1. Being a petroglyph, it must have been made by human hand. This can be determined by eliminating all potentially available natural explanations.
2. It must have been made by numerous blows of percussion. Where its surface is not too much altered by weathering, grains or crystals of the rock should show signs of percussion, i.e. fractured or crushed particles, recognisable microscopically by conchoidal fractures with impact points, internal cracking of crystals and signs of surface bruising. On very soft rock types, production traces may include detailed macroscopic tool marks.
3. As a petroglyph, it has been made intentionally, and it is expected to possess some non-utilitarian or symbolic function, even though its production may also have involved utilitarian dimensions.

Bednarik (2008) further argues that the first criterion is of universal application and that is more readily at the disposal of field researcher. Nevertheless, the second criterion is significantly more useful, because it can often be applied and reliable, testable and replicable. The third criterion can be expected beyond the ability of the researcher to define reliably, so its discriminatory worth is in practice. Moreover, he believes that there are cases where the third criterion can be applied successfully.

According to Bednarik (2008:62), the oldest rock art that one knows about in every continent are linear grooves and cupules, especially the latter. Cupules are found in some Lower Palaeolithic traditions, they are very common in Middle Palaeolithic contexts, some have been reported from Upper Palaeolithic times, and they occur in numerous Holocene traditions around the world. Cupules are said to appear very commonly in the Neolithic and Bronze Age contexts, but also those of Iron Age antiquity, and in Europe they were still frequently made in the Middle Ages. In some parts of the world notably in Australia, the production of cupules only ceased in the 20th century.

An early description of the cupules is by Rivett-Carnac who studied the cupules in Kumaon and Central India. He stated that cupules were frequent around Mahadeo shrines and temples and these were associated with carvings of lingam and yoni signs. In his other paper, he attempted to explain cup-mark variability, calling it permutation, as proto-writing code (Rivett-Carnac 1903).

There are several studies on Indian cupules (Kumar 1995, Kumar and Sharma 1999, Bednarik and Kumar 2002, Pawar 2012). The growing interest on the rock art in general and cupules in particular among rock art scholars in India has prompted them to form regional rock art societies to deal the subject systematically. Some of the studies by Kumar (1995), Kumar and Bednarik (2002) provide the dating of the cupules to the many scholars already working on the cup-marks in different parts of India.

In Pakistan, a very few studies have been done on the cup-marks. Cupules were given a scholarly attention by Italian scholars Olivieri and Vidale (2004, 2005) and Pakistani scholars (Kalhoro 2010-2011). The Italian scholars focused on the cupules in Swat valley. They have documented several cupules sites in the valley. The present author also documents several cupule sites in Islamabad and Sindh. The cup-marks in Sindh are totally unknown to scholars who are working in Pakistan.

Cup-marks in Sindh

The cup-marks are found in Khirthar, Bado, and Lakhri ranges of Sindh. Apart from these ranges, a large number of them can also be found in Maher, Thana Bula Khan and Gadap regions of Karachi and Jamshoro districts respectively. Some cupule sites are located along the Baran and Mol valleys. Locally these cup-marks are called, *jogun*, *piyala*, *Ninghoon* and *Ukhareyon*. They were used for a variety of purposes. Some small cup-marks were used and still used by people in Khirthar as oil lamps. This does not mean that their original use was also the same. Some large cup-marks were used for grinding spices, grains and making paints. Bednarik (2010) has listed 216 functions of the cup-marks.

Cup-marks in Khirthar

Cup-marks are mainly found on the horizontal surfaces, bedrocks, boulders, cave and cliff walls in Khirthar. They are also found on the walls of rock shelters. They mostly coexist with the engravings and pictograms.



However, a large number of cupules occur in isolation without any other engraving. They also exist along with grooves. Grooves have been seen at most of the cupule sites. There are several cupule sites without grooves. The picturesque locations of the cup-marks indicate that they might have been central to the cosmology of ancient people in Khirthar. Moreover, these cup-marks were used for a variety of ritual performances ranging from invoking the divinity for rain, healing to appealing ancestors to bring good luck for their economic pursuits.

Cup-marks in Nali valley

They are found in almost every *Nai* (hill stream) of Khirthar. However, the large distributions of cup-marks are located between the valleys of Mazarani and Nali.

Cup-marks in Nai Nali are located at Khotho, Chiti and Sado Mazo. Cupules occur on boulders and rock wall at Khotho. At walking distance from north of Khotho kumb is a sandstone cliff on which there are a large number of small cup-marks. The cliff is 60 feet high and faces the east. Cupules coexist with petroglyphs of humans and animals. Few geometric patterns are also drawn on the cliff. It is difficult to say anything about these small cup-marks. The whole rock wall is full of these cup-marks. There are two cupule panels, one faces the east and are made close to the geometric signs and the other near the engraving of a leopard. On the first panel are several cup-marks both small and large. The second panel has few cup-marks which are made above and below the petroglyph of the leopard. Six anthropomorphic figures with swords and guns are shown attacking a leopard. This motif of man attacking leopard is frequently found in many rock art sites in Nai Nali.

The appearance of so many cup-marks on the cliff seems that these were symbolic rather than utilitarian. It probably represents the nearby landscape of valley or represents cosmology of the early settlers in the valley. Apart from the cup-marks at Khotho, one can also find few cup-marks at Chiti. It lies 3 km north-west of Khotho near Zeni valley. There is a sandstone boulder here which is fully covered with petroglyphs of shoe and foot prints. Few cup-marks are also found on this boulder. There are 25 cup-marks on the boulder. These

are also non-utilitarian cup-marks but they had certainly meaning for those who produced them. One can only guess and cannot accurately interpret them. Interestingly all the cup-marks are made without the grooves.

Apart from these cup-marks at Khotho, there are a few cupules on a boulder at Chiti site. Chiti site is located 3 north-west of the Khotho rock art site. This boulder has a number of small cupules.

If one looks at the shapes and sizes of all these cup-marks they markedly differ from each other. There are a few rock art sites in Nali where one finds the most amazing cup-marks which are arranged in the shape of a plum blossom. One such plum blossom shaped cup-marks are found at Hur valley site. There are two large boulders with stupa images in Hur valley. South of these boulders is a small boulder representing cupules assembled in a circle. There are eight cup-marks which make a circle and inside the circle is a single cup-mark (Fig. 1). Thus, there are nine cup-marks which make the circle. This is the really interesting shape of cup-marks. Such types of cup-marks have also been found in Rozi Chhur dhoro at Laghani leg rock art site. These are badly weathered cup-marks.

Cup-marks comprise a prominent proportion of rock art in Nali Valley. There is another rock art site in Nali at Sado Mazo where cupules have also been found. Conversely, they have been produced on a cave wall. There are two caves at Sado Mazo both facing *kumb* (natural depression in the river bed where the water accumulates). Both caves depict rock carvings. The western cave has representations of hand prints, plant and bull. Some geometric signs have also been found on the cave wall. The western and eastern cave walls depict cut-marks or grooves. They are deep grooves. Similar cut-marks have also been noticed in the eastern cave. At the entrance of the western cave are the cup-marks (Fig. 2). There are several small cup-marks on the wall. They appear to be of the late period. Close to these are two stupa images which appear to be earlier than the cupules. Therefore, chronologically, one can place them in the medieval period.

Cup-marks in Gaj valley

There are many cupules sites in Gaj valley. Gaj



Figure 1. Cup-marks in the shape of plum blossom in Nali valley.



Figure 2. Cup-marks on the entrance wall of a cave in Nali valley.

valley lies 10 km north of Nali valley. Cupules have been found at Loi Dan, Zahargani Awar and Zahargani Thal. Cup-marks occur on a bedrock at Loi Dhan which is located in Shakloi sub-valley of Gaj valley. There are petroglyphs on a bedrock and a cliff. The cupules occur on the bedrock. Cupule designs are produced in double rows with seven cupules for each row. These are badly weathered cupules. They appear to be game boards. There are three game boards at Loi Dan rock art site. Such game boards have also been discovered in Radh, Sughro and Zahargani valleys. I have also discovered a large number of game boards in Islamabad which have been found in the heart of Islamabad city and the other villages in Islamabad (Fig. 3).

Two game boards at Loi Dan appear to be of the Bronze Age while the third is of later period most probably of the Iron Age. They were produced by indirect percussion technique. This rock art site lies on an ancient route which connects southern valleys with the northern valleys. This was a stopover for those people who intended to go to the Gorakh Hill. There are some rock shelters and overhangs where one finds petroglyphs. These game boards were probably used for those travellers who intended to go the Gorakh Hill or by those who were shepherds and temporarily halted at the rock shelters. It is more probable that these engravings and cup-marks were made by both travellers and the shepherds. Moreover, a



Figure 3. Cup-marks arranged in a double row. This is a game board locally called *Sath Githayon* (literally meaning a seven holed board game), Islamabad.



Figure 4. Pothole with an anthropic groove at Faizoo Garoti, Gaj Valley.

group of cupules has also been found at Faizoo Garoti rock art site which is located 1 km south of Loi Dan. There are six cupules arranged in a circle. Nearby this, is natural pothole with anthropic groove (Fig. 4). This is really interesting pothole which was used by humans in the past. It might have been used for collecting rainwater. Moreover, the accumulated water in a pothole might have been used for healing purpose or in a ritual. Such type of cupules was used for collecting rainwater which has been interpreted as soma, urine of Hindu God Indra. Olivieri and Vidale (2005: 453) believe that Vedic hymns associate soma, rain and the urine of Indra or the rain and the seeds of Indra-Parjanya to be collected in vessels. In the Vedic ideology of sacrifice, it is expected that after their use, stone cups and earth revert to plain earth and simple stone and this might explain the large number of cup-marks visible at certain locations.

Cupules have also been found in other sub-valleys of Gaj. Zahargani sub-valley has several cupules sites. At Zahargani Awar are cupules arranged in a double row. This is also a game board (Fig. 5). This occurs on the vertical surface of a boulder. Each row has seven cupules, there is another game board on the same panel which appears to be unfinished as the first row has four cupules and the second three. Or it may represent something else. Near the cupules are the engravings of animals and humans. Some geometric designs have also been made on the boulder. There is superimposition of animal and human images. The earlier images are of ibex which are superimposed by drawings of camels and horse riders. Horse riders are shown holding the swords. Some footmen are also shown holding swords and even the clubs. There are three boulders at Zahargani Awar. All three boulders depict human, animal and geometric designs. These boulders lie at the confluence of Sup *dhori* and Zahargani *dhoro*. A local word *Awar* is used for confluence. Ancient Shuko Wat (route) also converges at this confluence of Zahargani-Sup. The Shuko Wat connects Zahargani with Makhi valley via Zahargani Thal. There are several rock art sites on and off this Shuko route. The largest rock art site of this route is located at Zahargani Thal. There are two boulders at Zahargani Thal on which occur cupules. On the first boulder occur small and large cupules connected by grooves and produced in double rows (Fig. 6). Each row has seven cupules. This is a game board similar to those seen at Loi Dan and Zahargani Awar rock art sites. Apart from



Figure 5. Game board and rock carvings at Zahargani Awar, Gaj Valley.



game boards there are many smaller and larger cupules on the boulder. Some larger cupules are connected by grooves. Small cupules occur with grooves which are not connected with each other. The larger cupules are utilitarian (Fig. 7). They are actually mortars used for grinding spices and other edible things. These might have also been used for making paints. Other cupules with grooves might have been represented the symbolic system for the people who produced them. Another explanation



Figure 6. Game board at Zahargani Thal, Gaj Valley.



Figure 7. Large and small cupules at Zahargani Thal, Gaj Valley.



Figure 8. Man made groove connecting two kumbs (ponds) in Maher Valley.

could be that they represent the nearby landscape, for example cupule with groove may signify kumb or natural pond (also called pot or vessel). I have seen few kumbs in Khirthar where ancient people made a groove to bring water from the upper kumb to the lower kumb (Fig. 8). One such kumb can also be seen in the Maher valley with a groove or small anthropic channel connecting two kumbs. Therefore my argument is that two cupules connected by groove may represent the two kumbs. There are also a few kumbs with channel in Khirthar. These are used to bring or take water to agricultural fields. I believe that those cupules with grooves may represent the kumb with the channel.

On the second boulder at Zahargani Thal also occur large and small cupules with linear grooves. The whole boulder is engraved with linear-grooves (Fig. 9). There are only 15 cupules of which five are mortars and 10 are small cupules. Zahargani Thal is a piece of cultivable land surrounded by low-lying hills. It rises 2000 feet. It was inhabited by people in the ancient times which are indicated by large human records in the form of petroglyphs and megaliths. The graveyard of the medieval period is also located in Zahargani Thal. It is situated in a pivotal position which connects Gaj valley with Makhi valley. People still use this route to Makhi from Gaj. There are also a large number of petroglyphs in Makhi valley.

Cup-marks in Makhi valley

A large number of petroglyphs have also been found in Makhi. Cupules also occur on few boulders at some rock art sites in Makhi. Moreover, mortars also occur on some boulders in some dhoras of Makhi valley. One finds a mortar pounded on a small boulder at Loi Diref rock art site in Larkandi dhoro. The interesting feature of this mortar is that it is accompanied by cut-marks (Fig. 10). The sides of the boulders contain cut marks, some are deep. Interestingly, these appear to be knife and axe-sharpeners rather than linear grooves which are sometimes connected with cupules. There are many rock art sites where one finds cut-marks. However, they are numerous in Larkandi dhoro of Makhi valley. The Larkandi dhoro is connected with Zahargani Thal of Gaj valley. There are petroglyphs on boulders at Loi Diref rock art site. However, a single mortar has been recorded at this site. Few cupules have also been recorded in Sison



Figure 9. Mortars and grooves at Zahargani Thal, Gaj valley

dhoro. It is more likely that word *Sison* may be a phonetic variation of *Sassanian*. There are a few sites in Makhi which have reference to Zoroastrians. As we know that Sassanians were the followers of Zoroastrian religion. Some of the local terms refer to the Zoroastrians as Gaur. Local people believe that Gaur were Zoroastrians. Moreover, Goran Laki, meaning pass of the Gaur or Zoroastrians, is the ancient route which connects Phir Thal valley with Narani, Khurbi and Sallari valleys. Even *Makhi* is a phonetic variation of *moghi* who were Zoroastrian priests. On this ancient route of Goran Laki are many boulders which depict few Zoroastrian petroglyphs particularly fire-altars. People still use this route of Goran Laki to reach Phir Thal from Narani and Sison dhoro. Shepherds also move along this route. They take their herds from Sallari, Khurbi valleys to Phir Thal and Chane Thal in Makhi valley. From Chane Thal other routes lead to Chane Thal of Gaj valley. Both places are home to a large number of rock art sites. This had been an important route connecting Makhi in the south with Gaj and Khurbi and Sallari in the north.

Cup-marks in Sallari valley

There are also many rock art sites in Sallari valley. However, cupules have only been found at one site at Dar Kumb (Fig. 11). Sallari valley is 20 km west of K.N Shah Taluka in Dadu district. The Dar Kumb is 9 km from Sallari village which is located on the right bank of Sallari valley. At this kumb Sallari valley becomes very narrow. There is a route at 500 feet higher from this kumb. Few people use this route to move from the lower valley to upper valley. There are few shepherd huts of Alkhani and Shahani tribes in both the lower and the upper valleys. Those who reside at Chiti Khoh, Khazani Wari Buti and Chuk Thal use this route. There are two options either one has to cross kumb or use the alternate route. In both cases one has to take the upper route which is longer and tedious. The shepherds frequently use the upper route of Dar kumb. The lower route of Dar Kumb is only used by people without their herd. There is a wooden ladder installed here. People go climbing and holding the ropes which are tethered to the wooden pegs which are fixed in the rock. This is a very dangerous kumb to cross. Five people have drowned in this kumb. It's very deep kumb in the whole of Sallari valley. I have seen people crossing the kumb with sacks of rice and flour on their backs. On the



Figure 10. A mortar at Loi Diref, Makhi valley.

right bank of kumb occur several cupules (Fig. 12). They occur on semi-vertical and horizontal surfaces. Almost all the cupules are of medium size and equal in depth. There are 39 cupules occurring on lower semi-vertical rock surface and on semi-horizontal surface on the top of rock overhang. The top of the rock overhang contains 13 cupules of almost equal size and depth. It is very dangerous to stand on both rocks, the lower and top of the overhang. Top of the rock overhang is inaccessible now because some rocks have disintegrated between the lower rock and the upper rock overhang. One can have a view of the cupules from the shepherds' route above. One does not know why they were produced on these semi-vertical and horizontal surfaces. Only the producers of the cupules knew their use. We can only guess. They appear to be non-utilitarian. It is likely that these cupules signify the majesty of the kumb because the captivating view of kumb from the rock attracts the onlookers. Moreover, these cupules might have been associated with any ritual probably related to safe passage for the traveller. As discussed above this kumb is very deep and in recent past five people fell from wooden ladder and drowned in the kumb, it is likely that in the past these cupules were associated with a ritual that people might have been performed for the safe crossing of kumb.



Figure 11. Cupules at Dar Kumb, Sallari Valley.



Figure 12. Closer view of cupules at Dar Kumb, Sallari valley.



Cup-Marks in Mazarani Valley

Mazarani valley is located 15 km north-west of Faridabad in Dadu district. There are several rock art sites in the valley. However, cupules have been found at two sites. The first cupule site is located at Charwari dhori (a tributary of Mazarani Hill stream) and the second at Ukherayon waro kumb (Fig.13). There are four cupules at Charwari dhori. All cupules are large. This has been called by local people as Ukherayon or mortars. These cupules were used for grinding spices and grains. 1 km from Charwari dhoro is located Ukherayon Waro kumb where there are large cupules (Fig.14). They are also called "Ukherayon" because each of cupule resembles *Ukherayon* (mortar). These ukherayon or mortars occur on the left bank of Mazarani Nai. There are 18 cupules at this kumb. 11 mortars occur together whereas seven are grouped together which were used for grinding grains, spices and making paints. 11 larger cupules occur together with medium-sized seven cupules. They also occur on the same bedrock. These are the largest cupules discovered so far in Khirthar. The deepest cupules measure 18 cm.

These cupules are located on ancient route which connects the lower valley with upper valley of Mazarani. This route is still used by people who go to Kute-Ji-Qabar (Dog's tomb), the highest peak in the valleys of Mazarani and Seeta valleys. This peak rises 6800 feet. There are



Figure 13. Mortars at Ukherayon waro kumb, Mazarani valley.



Figure 14. Close view of mortars (locally called Ukherayon) at Ukherayon waro kumb, Mazarani valley.

two routes to reach Kute-Ji Qabar, the one goes from Mazarani and other from Seeta valley. On the former route is located many rock art sites. This route is not easy as compared to the one located in Seeta valley. One cannot cross the deep kumbs at certain places in Mazarani valley. People have made steps on the rocks which have been pounded into rocks to properly keep foot on it. These steps are locally called *dako*. There are three such places like Achho Dako, Sor Dako and Karo Dako. All these places became inaccessible during the rain which brings the inundation in the valley. Moreover, the people living in the side valleys of Mazarani also face difficulties in moving freely. It is likely that these cupules were used by ancient people who moved from one valley to another in search of the pastures for their herds. Both mobile and settled populations left their marks on the rocks. These cupules can also be associated with ancient population of Mazarani valley who constructed *gorbandis/gabarbands* (ancient dams). They used to construct gabarbands to stop and store rainwater for their use. It was used not only for drinking but also for agriculture. When the kumbs of valley, where population inhabited, became dry, the rainwater stored in gorbandi met their needs. Mainly these gorbands were constructed at the mouths of *dhoras* and *dhoris* (tributaries of river or valley) which stopped the rushing rainwater.

Conclusion

Cupules were made for some purpose. Some cupules represented belief system and the others served the utilitarian purpose of the ancient people of Khirthar. They mainly occur in groups, sometimes five and sometimes 40 at one place. Both large and small cupules have been found in different valleys of Khirthar. Large cupules were made for utilitarian purpose. The large cupules are locally called *Ukherayon* (mortars) which were used for grinding spices and grains. Some mortars were used for making paints. These are possible functions which local people are also familiar with. To further avoid speculations, one associates all the mortars to be used for grinding and preparing spices, grains, medicines and food. On the other hand the small cupules may have been used for some ritual of which we know nothing. Moreover, these cupules may represent the topographic map of the nearby landscape. I have also discussed above the possible function of cupules with grooves. This I interpreted as a groove or small channel originating from kumb (Fig. 15). This small channel takes water to agricultural land. There are two methods of bringing water to agricultural land, either one can take by constructing madh or making channel. People still use this traditional method of bringing water by means of madh to agricultural land. There are several madhs in Gaj and Sallari valleys.

Moreover, the small cupules may have been made to signify the majesty of some of the nature as reflected in kumbs. Put differently some kumb with turquoise blue water may have been attracted to ancient people to make the cupules. The numbers also played an important role in the cosmology of ancient people. It is likely that the numbers of cupules at one place may indicate a number of kumbs in one valley.

Cupules in Khirthar were produced by direct and indirect percussion methods. Cupules at Loi Dan and Zahargani Awar were produced by metal chiseling i.e. indirect percussion whereas those at Zahargani Thal, Dar

kumb, Loi Diref and Karo and Ukherayon waro kumb were produced by direct percussion.

The age of cupules vary in different valleys. The earliest cupules have been found in Gaj which are of the prehistoric period followed by the Bronze Age at Nali, Zahargani Thal. Some of the cupules of historic period have also been found in Makhi, Sallari and Mazarani valleys.

Zulfiqar Ali Kalhoro
Pakistan Institute of Development Economics (PIDE)
E-mail: zulfi04@hotmail.com

References

- BEDARNIK, Robert.G. 2008. Cupules. *Rock Art Research* 25(1):61-100.
- BEDARNIK, Robert. G. 2010. The interpretations of cupules. In Roy Querejazu Lewis and Robert G. Bednarik (Eds.), *Mysterious Cup Marks, Proceedings of the First International Cupule Conference*, pp. 67-73. Bar International Series, Oxford.
- BEDARNIK, Robert and KUMAR, Giriraj. 2002. The quartz cupules of Ajmer, Rajasthan. *Purakala* 13(1-2): 45-50.
- HUIHENG, Tang. 2004. Chronological studies and dating the cupules in China. *Archaeology and Cultural Relics* 146(6): 31-44.
- HUIHENG, Tang. 2012. New Discovery of rock art and megalithic sites in the Central Plain of China. *Rock Art Research* 29(2):157-170.
- KALHORO, Zulfiqar Ali. 2010-2011. Rock Art of Islamabad. *Ancient Sindh*. Vol.11, pp.27-35.
- KUMAR, Giriraj. 1995. Daraki-Chattan: A Palaeolithic cupule site in India. *Purakala*, 6(1-2): 17-28.
- KUMAR, Giriraj and SHARMA, Murarlila 1999. Documentation of cupules on Morajhari Cupule Rocks in Rajasthan. *Purakala* 10(1-2): 33-44.
- OLIVIERI, Luca. M., and VIDALE M. 2004. Beyond Gogdara I. New Evidence of Rock Artefacts from the Kandak valley and Adjacent Areas (Swat, Pakistan), *East and West* 54 (1-4): 121-180.
- OLIVIERI, Luca M., and VIDALE M. 2005. Analytical recognition or Visual maya? A cup-marked Megalith in the Kandak Valley (Swat, Pakistan). *East and West* 55 (1-4): 445-463.
- PADDAYYA, K. 1976. Cup-Marks in the Shorapur Doab (South India). *Man* 11(1): 35-38.
- PAWAR, A. Kantikumar. 2012. Petroglyphs from Hirapur. *Purakala* 22: 83-86.
- RIVETT-CARNAC, J. H. 1903. Cup-marks as an archaic form of inscription. *Journal of the Royal Asiatic Society of Great Britain and Ireland*, pp. 517-543.
- SHARMA. M. L, MEENA, M. L., and GODHAL, Vineet 1999. Distribution of Petroglyph Sites in Rajasthan. *Purakala* 19: 130-143.



Figure 15. View of Madh, a traditional method of taking water to agricultural land in Khirthar, Sindh.



Áreas Temáticas

Mesa 1. Quilcas en la Sierra Central del Perú

Coordinador: Lic. José Onofre

Mesa 2. Quilcas en la Costa Central del Perú

Coordinador: Dr. Arturo Ruiz Estrada

Mesa 3. Quilcas en la Amazonía Peruana y Sudamericana

Coordinadores: Lic. Daniel Morales Chocano y Mg. (c) Gori Tumi Echevarría López

Mesa 4. Quilcas en la Costa y Sierra Norte del Perú

Coordinador: Dr. Alberto Bueno Mendoza

Mesa 5. Quilcas en la Costa y Sierra Sur del Perú

Coordinador: Dr. (c) Pieter Van Dalen

Mesa 6. Quilcas más allá de los Andes

Coordinador: Dr. Alfredo Altamirano Enciso

Mesa 7. Teoría y Métodos para el Estudio de las Quilcas o Arte Rupestre

Coordinador: Mg. (c) Gori Tumi Echevarría López

Comisión Organizadora

Presidente

Dr. Alberto Bueno Mendoza

Miembros

Dr. Hernán Amat Olazabal

Dr (c) Pieter Van Dalen Luna

Dr. Alfredo Altamirano

Mg (c) Gori Tumi Echevarría López

Lic. Yuri Cavero Palomino