Mathematical and Scriptural aspect of Mekhala in the Construction of Yagya Kund

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Abstract. Yagya kund has five parts - Khat, Nabhi, Kant, Mekhla and Yoni. The construction of Yagya kund shall be done with proper consideration of all of its parts. The final shape and appearance of the Yagya kund came after the construction of Mekhala. Mekhala is an object which surrounds another object by keeping that object in the middle. For Yagya kund, Mekhala surrounds the fire pit which provides the shape to the Yagya kund. The present paper attempts to describe the mathematical and scriptural aspects of Mekhala i.e. description of Mekhala and Khat, shape, number of Mekhala, and significance. The number of Mekhala varies by the size of Yagya Kund, the number of offerings, and the purpose of Yagya. The study also described the dimension of all types the Mekhala construction for 1 hast Kund indicating the important role of Mekhala in the Yagya Kund construction.

Keywords. Mekhala, Yagya Kund construction, Number of Mekhala, Dimension of Mekhala

Introduction

Yagya is one of the main foundations of Indian Vedic culture. Yagya is not just a mere ritual for local welfare but it has wider applications. Veda describes that Yagya brings harmony and stability in the ecological cycles (1). In fact, the purview of Yagya includes the whole universe and all of its activity and functions. The proper flow of all the activities and functions of the universe is only possible because of Yagya (harmony & ecological balances), and hence, Atharveda states that अयं यज्ञो विश्वस्य भुिनस्य नावभिः (Ayam Yagyo vishwasya buvanasya Nabhihi) - it means - Yagya is the nucleus of the universe (2). Besides universal philosophy, the practical portion of the ritual containing Tools, Kund, Mandap, etc has also been very well defined in terms of purpose, construction and performance of the ritual. According to the ‘Yagya-Madhusoodan: स्मार्तकुण्ड समीक्षा अध्यायः (Smart-Kund-Samiksha-Adhyayah)’ chapter ‘atha-khatah’ (अथ खार्िः), Yagya kund has 5 parts. It states - अतः परमेषां पंचाञ्चावन खार्, नावभ, कण्ठ, मेखला, योवनरूपावि यथाकमत प्रदर्शयतन्र्े। (Atah parmesham panchaangani khat, nabhi, kant, Mekhala yonirupani yathakarm pradarshyante). It means the Yagya Kund has five parts: Khat, Nabhi, Kant, Mekhla and Yoni (3, page 46). Among them, the present manuscript focuses only on dimensions of Mekhala of Yagya Kund covering mathematical and scriptural aspects.

The word ‘Mekhala’ is an object surrounding the other object by keeping that object in its middle (4). The construction of Yagya kund shall be done with
proper consideration of all of its parts. The final shape and appearance of the Yagya kund comes after the construction of Mekhala. In scripture, Rishis recommend worshipping Yagya kund (shape and appearance) as the physical body of Deity (5) (6, shloka 31). The present paper discussed the shape, construction, numbers and significance of Mekhala.

Shape of Mekhala

According to Sharda Tilak book Volume- I, ‘र्ृर्ीय पटल’ (Tritya Patal), ‘मेखला लक्षण’ (Mekhala Lakshan) Shloka 67, ‘कुण्डनां यादृशं रूपं मेखलानाग्यं नादृशं।’ (Kundanam yadrasham roopam Mekhalanagyach tadrasham). It means - The shape of Mekhala is the same as the shape of yagya kund (7). It implies that if the shape of yagya kund is square then Mekhala will also be square in shape around the Yagya kund; if the shape of yagya kund is octagonal then Mekhala will be octagonal in shape, and so on. This scripture affirmation has also been given in Yagya-Madhusoodan (3, page 46).

Types of Khat (depth of Kund) with reference to Mekhala

Khat is a depth of Kund. There are two kinds of considerations for deciding the depth (Volume) of Yagya Kund i.e. 1) Kund Volume containing Mekhala with Khat, 2) Kund volume containing only Khat without Mekhala (8, Page 72).

1) Kund Volume containing Mekhala with Khat - In this type of Yagya kund the total volume of yagya kund includes depth of khat and height of Mekhala. For example, if the kund is 1 hast (24 angul), then the total volume of Kund will consist of the depth of khat (15 angul) and the height of Mekhala (9 angul).

Total volume (depth) of Yagya kund = depth of khat + height of Mekhala.

2) Kund volume containing only Khat - In this type of Yagya kund the total volume of Yagya kund includes only depth of Khat and excludes height of the Mekhala. For example, if the Kund is 1 hast (24 Angul), then, in that case, the total volume of Kund (24 Angul) will consist of the depth of Khat (24 Angul) only and will exclude the height of Mekhala (9 angul).

Khat with Mekhala is constructed when Havi (Hawan Samagri & other items to be offered in Yagya Kund) are Sukshma (coarse and not bulky), while Khat with Mekhala is constructed when Havi is bulky in shape i.e. Indian Bael-fruit (Aegle marmelos), Charu, etc (8, page 72 ).

![Figure 1](image-url). Types of Khat (depth of Kund) with reference to Mekhala. A) Kund Volume containing Mekhala with Khat, B) Kund volume containing only Khat.
Consideration of Kanth

Scriptures describe how to create a Kanth in the Yagya Kund. According to Pingalamat given in Kundratnavali Bhumika (Preface), खातादेकंगुलाम् त्यक्तत्िा मेखलानां स्थितिभिन्न् | - (khatadekangulam tyakta Mekhalanam isthirbhavet). It means Mekhala should be constructed after leaving 1 Angul of space (spacing horizontally on Bhumi-surface) after digging Khat during Kund construction (9; Page 12).

According to Sharda Tilak Tamtram, मेखलानां भिेदन्र्िः parito menirangulat, ekhastsya kundasya vardhyet tat kramat sudhih. Dashhastantmanyesham ardhangulavashat prathak. It means - if Kund is of 1 hast, then inside Mekhala on all the periphery, create Kanth of 1 Angul dimension. The Kanth size shall also increase as Kund capacity i.e. increase ½ angul per capacity of Kund increase by each Hast (7, ‘नेमी लक्षिं’ (Nemi Lakshan), Shloka 70).

Also according to Yagya-Madhusoodan, खातादेकंगुलाम् त्यक्तत्िा मेखलानां स्थितिभिन्न् एकाः॥ (Khatadekangulam tyakta mekhlanam vidhirbhavet, ekanga sa kantah swanmekhla khatmadhyamah. Ityukteh vradhdau tu duhaste divyangulam, trihaste triangulam, dashate dasaangulami tyevam neyam. Kund panchangnirmaneangulmaanasya paribhatiktvaat).

It implies that make 2 angul Kanth for 2 hast, 3 angul kanth for 3 hast kund, 10 angul kanth for 10 hast kund, and likewise (3, chapter अथ कं: (atha kanthah)).

As above described, Sharada Tilak Tantram recommends an increment of ½ angul of Kanth per increment for every 1 hast of Kund, while Yagya-Madhusoodan book recommends an increment of 1 angul of Kanth per increment for every 1 hast of Kund.

Construction of Mekhala

The size-dimension of Mekhala depends on the dimensions of Kund (1 hast, 2 hast, etc) and the number of Mekhala aimed for performing Yagya. The following description implies the consideration of the size variation of Mekhala to be considered for constructing Yagya kund with different numbers of Mekhala.

For Yagya Kund with One Mekhala

According to Mandapkund Siddhi, as per Pingalamat ‘एका षडङ्गुलोत्सेधा विस्र्ारा मेखला मर्ा। (eka shadangulotsedha vistara mekhla matra)’, it means the dimension for 1 Mekhala in Yagya Kund is 6 angul (outer height and width) (8, Page 86, chapter 3). The same description for only 1 Mekhala in Yagya Kund has been given in Yagya-Madhusoodan (3). It implies that for 1 hast of the Kund with only 1 Mekhala, the size (height and width) of Mekhala is ¼ of the hast (3). For example, 1 hast (24 angul) Kund, the size (outer height and width) of Mekhala will be 24/4 = 6 Angul. In 1 hast Kund with only one Mekhala, the outer height and width of Mekhala will be 6 angul only. This formula (i.e. ¼ of the no. of the hast) of Mekhala calculation for ‘Kund with only 1 Mekhala’ is also applicable for 2 hast, 3 hast, 4 hast, etc. accordingly (8).

Sharda Tilak Tantram mentioned the same formula as described above and stated that it has been also mentioned by Indian scripture Siddhant Shekhar, Somshambhu, Mahakapilpanchratre and Pratham (7, page 208).

Other opinions in addition to above stated opinions for the dimension of Mekhala for 1 Mekhala Yagya Kund also mentioned in the scripture. Yagya-
Madhusoodan mentioned that as per the Vidhanparijat for 1 Mekhala kund the height of Mekhala is of 4 angul and width is of 6 angul. "एका पक्षे तस्य चढ़न्तो विस्तार श्रृद्धान्ततस्तवृक्षयो विचारणे " (Eka pakshe tasya shad angulo vistar shchuturangulostuchhrayo vidhiyate), it means the height of Mekhala shall be 4 angul and its width shall be 6 angul (3) (8, page 49).

For Yagya Kund with only Two Mekhala

According to “शंतनान्तरक्त” (Trantantrokte) in Sharda Tilak Tantram, for construction of 2 Mekhala yagya kund it has been mentioned that ‘षष्टाम् शेनाष्टमांशेन मेखलाविर्यं मर्म्’ (Shashtam shenashtmanshen mekhladvitayam matam) (7). It means for 2 Mekhala construction the first Mekhala dimension (outer height and width) will be ⅙ of the hast of the Kund and the outer height and width of the second Mekhala will be ⅛ of the hast of the Kund. For example for 1 hast kund (24 angul), the dimension (outer height and width) of the first Mekhala is 4 angul (⅙ of 24) and the dimension (outer height and width) of the second Mekhala is 3 angul (⅛ of 24) (7, page 208). The same reference of ‘शंतनान्तरक्त’ (Trantantrokte) has also been mentioned in Yagya-Madhusoodan (3, page 50).

The other opinion given in Kund-Pradeep book for 2 Mekhala Kund is also mentioned in Yagya-Madhusoodan (3). It states, ‘द्वे मेखलापक्षे तु ते द्वे मेखले पन्चाङ्गुलचतुरांगुले कार्ये’ (dveMekhalapakshe tu te mekhale panchangulachaturangule karyye). It implies that the yagya kund with 2 Mekhala have first Mekhala of 5 angul dimension (outer height and width) and second Mekhala of 4 angul dimension (outer height and width) (3).

In summary, for 2 Mekhala Yagya Kund, “शंतनान्तर्क्त” (Trantantrokte) opinion recommends 1st Mekhala of 4 angul and 2nd Mekhala of 3 angul, while opinion of Kund-Pradeep book recommends 1st Mekhala of 5 angul and 2nd Mekhala of 4 angul. However, the former “शंतनान्तरक्त” (Trantantrokte) opinion is also reflected in “कपिलपण्ड्रत्रा” (Kapilpanchratra) opinion for 3 Mekhala Kund, which concludes that the dimensions of the two Mekhala yagya kund are similar to the first two Mekhala of 3 Mekhala yagya kund (3, page 50). Thus, a diagram of two Mekhala as per the opinion of “शंतनान्तरक्त” (Trantantrokte) is given in Figure 2.

For Yagya Kund with only Three Mekhala

The description for three Mekhala Kund is widely available in the scriptures. The dimension of Mekhala for Yagya kund with three Mekhala is given in figure 3. In addition, the present study described 3 different opinions for Mekhala construction for Yagya kund with 3 Mekhala, which are depicted in Figure 4 and described as following.
1) Three Mekhala calculations as per KapilPancharatra, Sharda Tilak and Kriyasaren
As per the ‘कवपलपञ्चरािा’ (Kapilpanchratra) formula for calculation of the dimensions of Mekhala in Yagya Kund for 3 Mekhala given in Yagya-Madhusoodan, “कुंडसाध्वातिकातृत्वाति विर्यां आविभाजिता स्मृतिः।
तृतीया दर्शाया त्या दिति कवपलपञ्चरािीक।” (kundshadbhagika tvadhya dvitiya ashtashinka smruta, trutiya dvadshansha syad iti kapilpanchratrokk)" (3). It means that the dimension (outer-height and width) of the first Mekhala (last from the Kanth/ground) is 1/6 of the number of hast (1 hast=24 angul), followed by the dimension (outer-height and width) of the second Mekhala from the ground is 1/6 of the number of hast and dimension (outer-height and width) of the third Mekhala from the ground is 1/12 of the hast of the kund (3). So the dimension (outer height and width) of the bottom Mekhala of 1 hast kund would be 24/12=2 angul, for middle Mekhala would be 24/8=3 angul, and for upmost Mekhal would be 24/6=4 angul.

These same Mekhala calculations of ‘कवपलपञ्चरािा’ (Kapilpanchratra) are also represented in Kriyasaren book. It describes “प्रधानमेखालोत्सेध्मुक्तमि
नवाङ्गुलम्।
त्वाद्वे मेखालोंचें पञ्चाङ्गुलानिी स्मृतू।
तत्रात्मेखालोविर्यांकामह।
चतुर्यांविर्यस्य मेखालामिन्तु।” (Pradhanmekhlo tsedhmuktmtra navangulam,
Tvadhye mekhlotsedham panchagulamiti smratam.
Tvahye mekhlotsedhamanguldvitaym kamat,
Chaturistridvangul vyasa Mekhala trityasya tu) (3).

It means for the Yagya Kund with three Mekhala, the inner-height of the first Mekhala that is from Kanth (from the ground) is 9 angul, followed by the inner-height of second Mekhala which is of 5 angul and the third Mekhala which is of 2 angul. The width of the same would be 4 angul, 3 angul and 2 angul respectively (Figure 3). In addition, the same dimensions for 3 Mekhala represented in Kriyasaren book has been mentioned by Maharshi Abhay katayan, Mandap kund siddhi chapter 3, (8, page 81). The same dimensions also mentioned by Sharda Tilak Tantram book (7, page 206).
2) Three Mekhala calculations as per Kundratnakar
In addition to the Mekhala calculation by Kapil Pancharatra, Sharda Tilak and Kriyasaren, which recommends 4, 3, 2 angul Mekhala (outer height and width), the different opinion is by Kundratnakar, which recommends 6, 3, 2 angul Mekhala (outer height and width) has been mentioned. The Yagya-Madhusoodan has given calculation of Mekhala construction for Yagya Kund with 3 Mekhala as described in ‘कुण्डरत्नारोक्ं’ (Kundratnakroktm) as ‘क्षेिस्यिादशभागैः प्रथमायिः अष्टभागैःदवितवर्यायािः, चर्ुवभतभातगैः -स्र्ृर्ीयाया उत्सेधिः कार्य्यत इवर्।’ (kshetrasya dvadashbhagehah prathmayah, ashtbhagerdvetiyayah, chaturbhirbhage stritiyaya utsedah kaaryye iti) (3). It means that the dimension (outer-height and width) of the bottom Mekhla is 1/12 of the number of hast (1 hast=24 angul), followed by the dimension (outer-height and width) of the middle Mekhla from the ground is ⅛ of the number of hast and dimension (outer-height and width) of the utmost Mekhla from the ground is ¼ of the hast of the kund (3, page 51). Hence, the dimension (outer height and width) of the bottom Mekhala of 1 hast kund would be 24/12=2 angul, for middle Mekhala would be 24/8=3 angul, and for upmost Mekhala would be 24/4=6 angul.

3) Three Mekhala calculations as per Vashist Sanhita
Besides two opinions of Mekhala calculations as described above, another opinion is also given in Vashist Sanhita. It states ‘प्रथमा मेखला तत्र द्वादशाङ्गुलिः। चतुर्भिंद्राङ्गुलैः स्थत्त्विश्वानिः समन्त।। तस्याश्रीलोकः स्वाणुशुद्भुः। अत्योऽऽवमयेन वनः। कायाः च। सोप्रो तृतीयेः।’ (Prathma mekhlah tatra dvadashanglelwistrata, chaturbhinglaestsyashchomnatisch samntatah. Tasyashchopari vaprah syachcturangulmnunntah, ashtabhirangulae samyagvistirntu samntatah.

Tasyopari punah karya vaprah soapi tritiyakah chaturangulvisitrinschomnitsch tatha vidihih) (3). It implies that for 1 hast kund the utmost Mekhala inner-height would be 12 angul from Kanth (ground), the inner-height of the second Mekhala would be 8 angul and the third would be 4 angul. The width of each of three Mekhala would be 4 angul.

This calculation of Mekhala for 1 hast given in Vashist Sanhita has been also referred to by Mandap Kund Siddhi (8, page 83), Yagya-Madhusoodan (3, atha Mekhala), and Sharda Tilak book (7, Tritiya Patal, Mekhala Lakshan). As per the Chapter 3 Shloka 4 of Mandap-kund siddhi (8, page 83), ‘स्वाणुशुद्भुः कायाः च। समन्त।। चतुर्भिंद्राङ्गुलैः स्थत्त्विश्वानिः समन्त।। शाश्वके शतमाशेंन पञ्चमेखलाविस्र्ारार््।’ (rasanshkaduntavistrutashch tistroathvaiya yugbhatulya), it implies that the dimension (height and width of the Mekhala in Yagya kund with three Mekhala would be ⅔ of the hast. For example, for 1 hast (24 angul) Kund, it would be 4 angul and for other hast calculations can be made that way.

For Yagya Kund with Five Mekhala
As per the ‘Yagya-Madhusoodan’, ‘अथ केचि पञ्चमेखला। तस्म च प्रथमादिः क्रमेव पञ्चमेखला। पञ्चाङ्गुलश्च चर्ुरङ्गुलस्त्र्यंगुलो श्च च विश्वानिः।’ (ath kechit panchmekhla ichchhanti. Tasam ch prathma dinam kramen, panchangulshchturngulstrayngulo dvyaangulashch vistaro vidhii). Ten panchMekhalavistarat kanto vahirbhage vinshtyangulsthalyagahoh bhavti. ……atrochchhrayah panchmashenna hrasti) (3, page 52). It implies that for Yagya kund with five Mekhala, the width of the first Mekhala will be 6 angul, followed by 5, 4, 3 and 2 angul. This is also said by Sharada Tilak as मेखलाः पञ्च वा कायाः। पञ्चाङ्गुलश्च चर्ुराङ्गुलस्त्रीयाः।’ (Mekhalah panch va karya shatpanchabhidhipakshakaeh) (7, page 208)). The
The width of the bottom three Mekhala of 5 Mekhala Kund and 3 Mekhala of 3 Mekhala Kund has been the same i.e. 4,3,2 angul. For the width calculation for the three Mekhala the formula has been given in scripture (table 1), while for the five Mekhala the scripture only defined width with specific numbers i.e. 6,5,4,3,2 angul of Mekhala.

The inner-height of 1 hast Yagya kund with five Mekhala and three Mekhala has been the same i.e. 9 angul. For the five Mekhala kund, the total-inner-height (9 angul for 1 hast) is divided by five to find each of the Mekhala’s outer-height i.e. 9 angul /5 = 1.8 angul/yav/yuka for 1 hast Yagya kund.

Consideration of Number of Mekhala based on number of offerings (Yagya kund capacity) and purpose of Yagya

The number of Mekhala vary with capacity of the Yagya Kund and number of offerings of Yagya kund (6). Scriptures describe Kunds with the number of Mekhala varying from 1 to 7 as per the purpose as well as per the capacity of the Kund and purpose of Yagya (3, 6) (7, page 206) (8, page 80).

Preference of three Mekhala and Five Mekhala

In addition, Yagya scholars and scriptures have preferred Three Mekhala Kund over two and one Mekhala Kund and also have preferred five Mekhala kund over two and one Mekala Kund. In the Yagya-Madhusoodan book, it is mentioned as उत्तमं वत्िह वनवदतष्टम् कुण्डम् िै पञ्चमेखलम्। विमेखलं भिेन्मध्यं वहनं स्यादेकमेखलं।। (uttam tvih nirdishtam kundam vai panch Mekhalam, dviMekhalam bhavenmadhyam himin syadekMekhalam, yadva manishibhah prokkmuttam syatriMekhalam, dviMekhalam bhenmadhyam himin syadekMekhalam) (3).

This is also mentioned in the Sharda Tilak, ‘नाब्यनियमायुक्तं कुण्डं श्रेष्ठं ग्राहम् दिशेकलं जुण्डं दिशेकलं गयम् नीचं स्वारदेश्चेतलं इ’ (Nabhiyonismayuktam kundam shreshtam triMekhalam, Kundam dviMekhalam madhyam neecham syadekneekhalam). It implies that in the Yagya kund which consist of Nabhi and Yoni, 3 Mekhala are preferred over 2 Mekhala and 1 Mekhala kund (7, page 206; Nemi Lakshanan, Shloka 67-69 commentaries section).
### Table 1. Calculations and formula for Mekhala construction of Yagya kund with one, two, three and five Mekhala. 1 angul considered is equal to 1.9 cm.

| Kund with Number of Mekhala | Mekhala construction formula | Size of Mekhala in angul/yav/yuka (cm) for 1 hast (24 angul) Kund | Factor for calculating Mekhala dimensions | Number of Mekhala | Breadth | Outer-height | Inner-height |
|-----------------------------|-----------------------------|---------------------------------------------------------------|------------------------------------------|------------------|---------|-------------|-------------|
| One Mekhala                 | Pingalamat                  | Only one                                                     | 6/0/0 (11.4)                             | 6/0/0 (11.4)     | 6/0/0 (11.4) |
| Two Mekhala                 | Trantantrokde               | Utmost (First)                                              | 4 (7.6)                                  | 4 (7.6)          | 7 (11.2) |
|                             |                             | Bottom (Second)                                             | 3 (5.7)                                  | 3 (5.7)          | 3 (5.7) |
| Three Mekhala               | Kapil Pancharatra, Sharda Tilak and Kriyasaren | Utmost (First)                                              | 4 (7.6)                                  | 4 (7.6)          | 9 (17.1) |
|                             |                             | Middle                                                      | 3 (5.7)                                  | 3 (5.7)          | 5 (5.7) |
|                             |                             | Bottom (Third)                                              | 2 (3.8)                                  | 2 (3.8)          | 2 (3.8) |
| Five Mekhala                | Yagya-Madhusoodan           | Utmost (First)                                              | 6^1/6/3 (3.42)                           | 9 (17.1)         |
|                             |                             | Second                                                      | 5^1/6/3 (3.42)                           | 7/1/5 (13.68)    |
|                             |                             | Third                                                       | 4^1/6/3 (3.42)                           | 5/3/2 (10.27)    |
|                             |                             | Fourth                                                      | 3^1/6/3 (3.42)                           | 3/4/6 (6.82)     |
|                             |                             | Bottom (Fifth)                                              | 2^1/6/3 (3.42)                           | 1/5/3 (3.17)     |

Some scholars however, prefer 5 Mekhala over 3 Mekhala. Also as per Pinglamata given in Kundratnavali book, 5 number of Mekhala is preferred over 3 number of Mekhala; it states ‘मेखलाकथावत जिनसे भूसंख्यथिा प्रिे’। (mekhaekthava tistro bhutsankhyathva priye) (15, page 13).

Regardless, preference and scriptural popularity exists for 3 Mekhala kund and 5 Mekhala kund (3, 7). Both books (Sharada Tilak Tantram and Yagya-Madhusoodan) have not described Mekhala more than 5. In addition, in depth details for 3 Mekhala Kund constructions is available while for more than five Mekhala is scanty. Though LakshanSangrah opinion provides that some yagya scholars preferred 5 mMekhala over 3 Mekhala, yet applicability and available details are more available for 3 Mekhala Kund. Also 5 and 3 are both preferred over 1 and 2 Mekhala Kund, which is also well defined. Hence, the study described Mekhala calculations for 1,2,3 and 5 Mekhala Yagya kund (Table 1).

**Consideration of five or higher number of Mekhala**

Number of offerings decides the capacity of the Kund (13, 14). Three Mekhala and Five Mekhala Kund are widely preferred by Yagya scholars and scripture. However, as referred in Bhavishya Puran (Khand 1, chapter ‘vividh vidhi kund nirnay’), for 1 lakh ahuti (4 hast Kund), it is advised to construct 5 Mekhala Kund (shloka 26 -पंचमें खलकं लक्षकोटयां च योजयेर््), while further it indicates for 8 hast and 6 hast (shloka 28 -िसुहस्र्े भानुपंवडक्ायुतग्महीनेअवप र्ािः क्रमार््) 12 Mekhala Yagya kund shall be used. However, the book also implied that as per the capacity of performer even for the higher number of offerings, Yagya kund with 1 Mekhala shall also result in a good outcome (shloka 30) (6, page no 57).
Number of Mekhala based on purpose of yagya

According to ‘Somshambhu’ mentioned in Sharada Tilak ‘तिर्मेखलां द्विवे कुण्डे क्षत्रियय विप्रेखन | खलेका तु वैश्यय ||’ (TriMekhalam dvije kunde kshatriyasya diviMekhalam, Mekhalaeka tu vaeshhyasya), it implies that Bramhin is advised to do yagya in yagya kund of three Mekhla, kshatriya are advised to do Yagya in yagya kund of 2 Mekhla and vaishya are advised to perform Yagya in 1 Mekhala yagya kund (7, page 206) (8, page 80). It also implies that Brahmin purpose of wisdom, Kshatriya purpose of protection, and Vaishya purpose of Business and Management can be achieved with Yagya kund with three Mekhala, two Mekhala and One Mekhala respectively. This way the number of Mekhala also depends on the purpose of the Yagya. (8 page 80).

Mekhala significance

Yagya represents the nucleus of all universal activities. This depiction also reflected Mekhala number and color. Three Mekhala colors are white (utmost), red (middle) and black (bottom) which reflect the three universal forces i.e. Bhrama (creation), Vishnu (nurishment), Shiva (destruction-rejuvenation). In addition, three Mekhala colors, white (utmost), red (middle) and black (bottom) also reflect three Gunas (fundamental force of universe) i.e. Satvik, Rajsik and Tamsik. This interpretation is given in the shloka of Sharada Tilak ‘योनि लक्षिं’ (Yoni Lakshanam), Shloka 75 (commentaries section); it is mentioned that among these Mekhala the first Mekhala is of SATVIK phenomena, the second one is of RAJSHIK phenomena and the third one is of TAMSIC phenomena. ‘सावत्ििी मेखला पुर्वि विस्र्िय द्वादशाङ्गुला। योनि राजम् प्रोता मेखलातिरंगुललयः।’ is a rule in the construction of Mekhala kund. (7 page 212). The shloka also confirms Vashishta Samhita opinion of Mekhala dimension i.e. 4 angul (width and outer-height) of each three of Mekhala.

Discussion & Conclusion

Mekhala holds the important aspect of the yagya kund as it not only gives Yagya kund a shape by giving a circumference to Khat but it also represents the fundamental forces of Yagya through its color and also represent physical body of Deity. The present study provided detailed construction of all types of Mekhala referenced in Yagya scripture i.e. consideration of Mekhala shape, its construction, factors for deciding numbers of Mekhala and significance of Mekhala. For Yagya kund with Mekhala 1, 2, 3 and 5 all details of construction are provided in the study (Figure 1-5 and Table 1) for 1 hast. For 2 hast (), 3 hast (), 4 hast (), 5 hast (), 6 hast (), 7 hast (), 8 hast (), 9 hast (), and 10 hast (), Yagya kund Mekhala details can be simply derived from ratio calculation to the one hast. While doing this ratio calculation, the final value should be carefully converted to angul/Yav/Yuka conversion.

Some considerations for Mekhala construction

In the Kund construction, scriptures refer to the term ‘विस्तार’ (Vistar) of the Mekhala, which is referred to as the dimension of the Mekhala. It implied that dimensions of Mekhala include both width and outer-height of Mekhala and both are usually same (width = outer-height) unless defined. Such as in the case of five Mekhala Kund, the outer height of the Mekhala is fifth of the total height of all Mekhala. For 3, 2 and 1 Mekhala kund width is the same as outer height (except Vidhanparijat opinion).

The study had included all opinions of Mekhala given in Yagya-Madhusoodan and Sharada Tilak book except VidhanParijat opinion for 3 Mekhala
Kund which is also not mentioned in Sharada Tilak book.

In addition, the inner-height of the Mekhala is considered from the surface (Kanth or ground). To understand it better, it can be given in the following formula as ‘Inner-height of the given Mekhala = outer-height of the given Mekhala plus sum of all the lower Mekhalas’ outer-height’.

Consideration of total height of Mekhala for five or higher Mekhala Kund

For 1 hast Kund with Khat, it is defined that a total 9 angul of height shall be used for Mekhala construction. Total Mekhala height for 3 Mekhala kund is 9 angul which can be calculated based on the formulas given for each of Mekhala. However, for deciding the total height for the five Mekhala kund, there is no formula given as per the books referred to by the study. Though it covered the calculation of height for all five Mekhala by subtracting one-fifth of total height (first Mekhala’s inner-height) from previous Mekhala, there is no indication how to choose the total height taken 9 angul as for 1 hast kund. Hence, the study recommends a total height of three Mekhala kund for different hast kund calculation. This consideration can also be applicable for seven, twelve or other higher numbers of Mekhala.

In the five Mekhala kund, total-height (of all Mekhal) is divided into five equal parts to find each individual Mekhala’s height (outer-height). This consideration can be applicable for seven, twelve or any higher number of Mekhala kund construction i.e. 7 Mekhala kund and 12 Mekhala kund by dividing the total-height into 7 and 12 parts respectively. Thus, the height calculation of Mekhala for the five or higher number of Mekhala kund is defined.

The width and height of each Mekhala for any hast of Kund can be calculated using ratio of width to the hast used for 1 hast kund. The five Mehal kund width for the 1 hast kund is found in the scripture and is defined in the study. However, the present paper could not find the width of Mekhala for the seven and twelve number of Mekhala kund having a scope of further research.

References

1. Sharma S. (pandit Shriram Sharma Acharya) and Sharma B. (Bhagwati Devi). Yajurveda Samhita. Yugnirman yojana trust. 2002. Page 3. Available from - http://literature.awgp.org/book/yajurveda/v1
2. Sharma S. (pandit Shriram Sharma Acharya). Atharveda. Yugnirman Yojana Trust. 2015. Available from - http://literature.awgp.org/book/atharveda/v1
3. Ojha M. ‘Yagya-Madhusoodanan: मधुसूदन नाथ (Smart- Kund-Samiksha-Adhyayah) chapter 'atha-khatah' (अथ खातः) and chapter atha mekhala. Vedic Press Ajmer. 1928.
4. Wisdom Library.Mekhala, Mekhali: 31 definitions , 2021. Available from https://www.wisdomlib.org/definition/Mekhala
5. Sharma S. (Pandit Shriram Sharma Acharya). Yagya ka Gyan Vigyan (Vangmay 25). Akhand Jyoti Sansthan Mathura.1997. Section - 5.42; Available from - http://literature.awgp.org/book/yagya_ka_gyan_vigyan/v1
6. Sharma S. (Pandit Shriram Sharma Acharya). Bhavish Puran. Sanskriti Sansthan Bareli. 1970. Pratham Khand, chapter ‘vividh vidhi kund nirnay’ shloka 26-30.
7. Malviya, S. Sharda Tilak Tantram, मेखला लक्षिं (Mekhala Lakshan). Chowkhamba Sanskrit Pratishthan Delhi. 2001. Vol. 1.
8. Katyayan A. Mandapkund Siddhi. Chowkhamba Srbharti Prakashan Varanasi. 2017.
9. Dikshit S. Kundratnavali. Sampurnand Sanskrit University Varanasi. 2003. (ISBN no. 81-7270-125-X).
10. Katyayan A. Kundark. Chowkhambha surbharti prakashan Varanasi. 2014.
11. Shrivardrajpranita. Laghusidhhantkoumudi, subodh sutra. Choukhambha Sanskrit bhanan, Varanasi. 2018:p-582; sutra 864. (ISBN: 978-81-89986-89-6).
12. Geetapress. Bhagwat geeta. Geetapress gorakhour. 2018. verse 3.10.
13. Chandel E, Vijay V. Yagya Kunds of one-hast (24 angul) with different shapes have equal volume. Interdis. J of Yagya Res. [Internet]. 2021;3(2):01-8. https://doi.org/10.36018/jyjr.v3i2.60
14. Motlani J. The Size and Shape of Yagya Kund: Mathematical and Spiritual aspects. Interdis. J of Yagya Res. [Internet]. 2020;3(1):08-4. https://doi.org/10.36018/jyjr.v3i1.50
15. Dikshit S. Kundratnavali. Sampurnand Sanskrit University Varanasi. 2003. (ISBN no. 81-7270-125-X). Page 13.