

Result of Chinggis wall (Sartagtai) investigation

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The huge ground wall construction named “Chingiss wall” occurred different parts of central Asia mostly in territory of Mongolia. Some of them stretches several hundred kilometers. Radio carbon (C14) dating of Sartagtai channel or Chingiss wall of Khovd aimag of Mongolia show that, wall was created 1370-1380 (± 40) year before present. This is end of Early Turk empire time (625-635 AD) and China Tan empire ruled in territory of Mongolia. We are conclude, Sartagtai wall with channels constructed as a defense wall against nomadic tribes living in the Altai mountains. Sartagtai wall structure, size and age is similar as another Chingis walls in Eastern Mongolia and Gobi.

The ground wall construction named “Chinggis wall” occurred different parts of central Asia mostly in territory of Mongolia. Some of them stretch several hundred kilometers. But, up to now, origin of this huge construction is not clear. Local peoples mostly believed that was build by Chinggis khan time or XII-XIII century. But not much detailed investigation was done about this construction. Researchers opinion about origin of these walls is different: irrigation channel, boundary line, defense wall and etc [1,2,8,9]. Some of researchers think this is earth quake fracture, lake terrace or not human made land feature. On the article 281 of main historical manuscripts Chinggis khan time “Secret History of Mongolia” mentioned some wall “urt horoo” which Ogoodei khan build in 1228-1241 for protection or keep of steppe gazelles, called this walls “Hurua, Iurha” [4]. All of these dates not clear, not sufficient to prove origin of this huge construction.

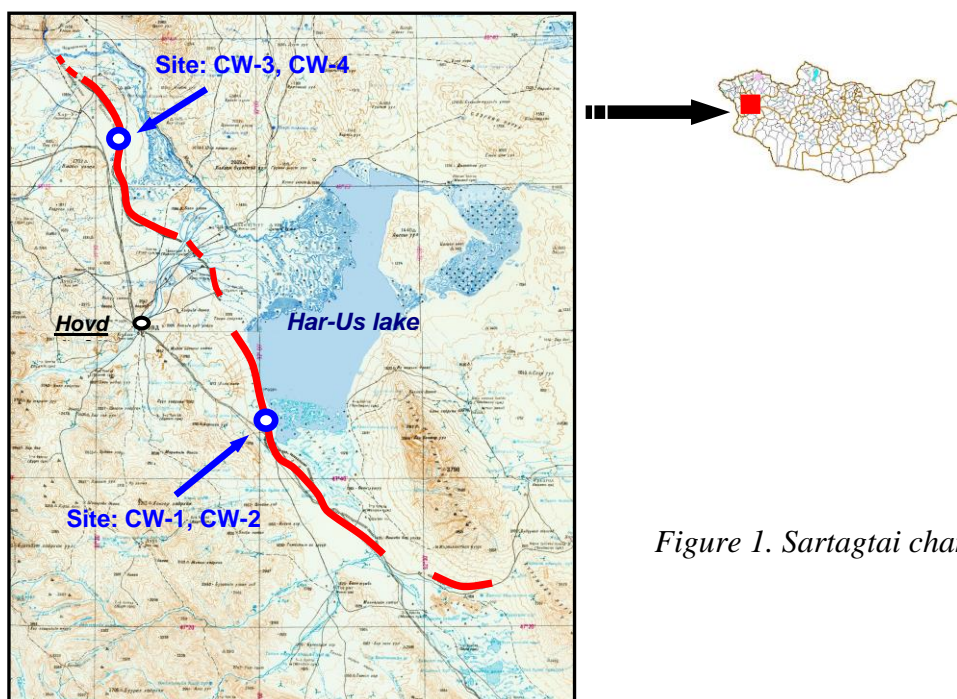


Figure 1. Sartagtai channel location.



Photo 1. Chinggis wall in the “Haltariin huduu” of Erdeneburen soum of Hovd aimag.

Aim of our investigation is in case study of Sartagtai wall of western Mongolia try to answer when who why built a this wall. Field investigation was carried out July of 2005 by financial support of “Mongolian Altai Institute”.

Study area situated western Mongolia north part of Hovd aimag. Wall continuing from south part of Hovd river, Har-Us lake more than 175 km. Local peoples called these constructions as “Sartagtai channel”.

Depending of geographical condition of places wall and channels some places very clear and some places eroded and destroyed. The “Haltariin huduu” is place where wall and channel construction was well preserved (Photo 1). Usually channels with 1.0-1.5 meter depths on the south or upper parts and wall with 1.5 meter heights on north part or lower parts. On the walls within a 30-50 meter intervals occurred small stone mounds. Local peoples not created this stone mounds. That’s at least, last 200-300 years this is not created, therefore more probability that stone mounds originated by wall construction time. Possible some specific sign of construction interval or guarding troop location etc.

One of interesting fact is that in the foot slopes of “Yamaat ulaan” mountains (Buljim) channels was going through the hard rocks. Digged out 2 meter deep 10 meter wide 10 meter long channels in the hard rock granites.



Photo 2. Channels digged in the hard rocks granites, “Yamaat ulaan”.

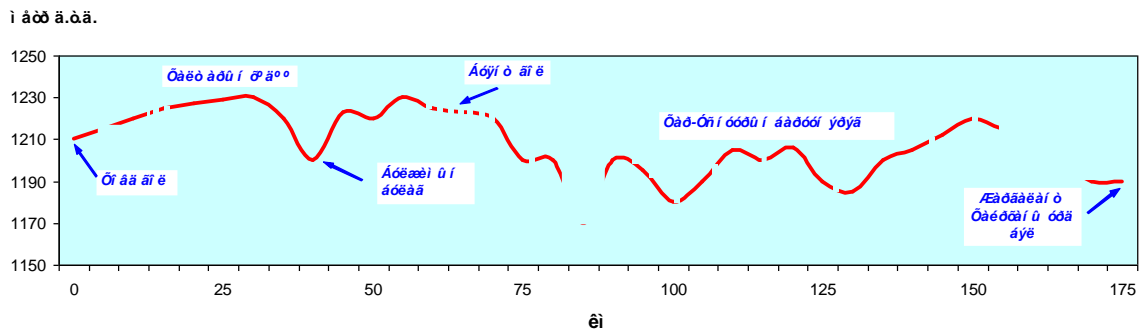


Figure 2. Hypsometric line of Chinggis wall

One of main hypotheses is this channel with walls constructed by irrigation purpose [8]. Constructed peoples want to flow Hovd river to the south-west into dry valley of “Zergiin hundii”. First glimpse this is looks like irrigation channel. But, this is not irrigation channel.

Several reasons objected to irrigation channel hypotheses:

1. Hypsometric line of Chinggis wall was not linear. (Figure 2). If this is was irrigation channel, hypsometric line will straight with left side inclination down.
2. On the downstream of Buyant river wall was crossing several small rivers (Figure 1.)
3. For irrigation channel this is very big construction.
4. Not any small branch channels and agriculture fields like in irrigation systems
5. Nomadic peoples not much used irrigation channel or agriculture in central Asia.

Possible some places used as irrigation, but whole channel is not irrigation system.

We make a detailed investigation of Sartagtai wall and channels in 2 places (Figure 1). Make a soil profiles on the walls, in channels and nearby nature soils.

Site 1 with profiles No. CW-1, CW-2 located south-west part of Har us lake. This foot slope of mountain.

| | | |
|------------|---|----------------------------|
| Location | N | 47°46'07" |
| | E | 92°00'58" |
| Elevation: | | 1193 meter above sea level |

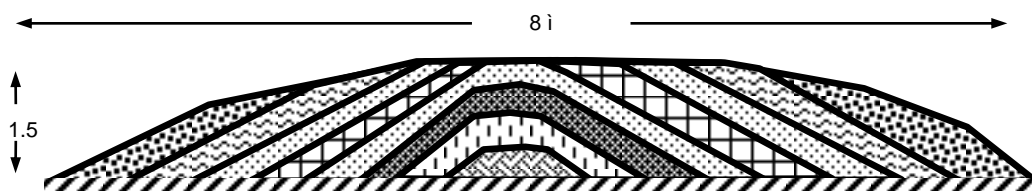


Figure 4. Chinggis wall schema in site west of Har-Us lake.

Wall was consisted 8 different layers. Upper 4 layers eroded.

Site 2 with profiles No. CW-3, CW-4 located west part of Hovd river on the wide plains.

Location N 48°24'30"

E 91°34'20"

Elevation: 1224 meter above sea level

Table 1. Sartagtai wall and channel sediment chemical composition

| Profile No. | Site location | Layer | Depth (cm) | pH | Humus % | Ca ²⁺ CO ₃ % | Year (Before Present) C14 |
|------------------------|--------------------------|--------------------------------------|------------|------|---------|------------------------------------|---------------------------|
| Wall | | | | | | | |
| CW - 01 | West part of Har-Us lake | Brown, stone, stone loam, with roots | 0 – 25 | 7,25 | 0,53 | 1,36 | |
| | | Gravel silt loam | 25 – 50 | 7,21 | 0,51 | 2,24 | |
| | | Gravel fine sand | 50 – 80 | 7,77 | 1,97 | 1,20 | |
| | | Brown, fine sand | 80 – 105 | 7,66 | 1,98 | 2,16 | |
| | | Buried soil | 105 - 130 | 7,41 | 2,56 | 1,36 | 1370 ± 40 |
| Channel | | | | | | | |
| CW - 02 | West part of Har-Us lake | Gravel, Silt loam | 0 – 35 | 8,14 | 1,60 | 1,12 | |
| | | Fine sand stony | 35 – 70 | 8,04 | 1,45 | 1,06 | |
| | | Fine sand, stony | 70 – 95 | 7,84 | 1,30 | 1,04 | |
| | | Clay few gravels | 95 – 120 | 7,96 | 2,56 | 1,52 | |
| | | Channel bottom, stony loam | 120 - 150 | 8,28 | 1,67 | 0,56 | |
| CW - 03 | Haltariin huduu | Fine sand | 0 – 10 | 8,24 | 1,81 | 0,44 | |
| | | Fine sand | 10 – 20 | 8,29 | 2,09 | 0,58 | |
| | | Fine sand, few stones | 20 – 40 | 8,30 | 0,70 | 1,01 | |
| | | Yellow brown, medium sand | 40 – 60 | 8,28 | 0,36 | 0,58 | |
| | | Medium sand | 60 – 100 | 8,24 | 0,14 | 0,48 | |
| | | Coarse sand | 100 - 130 | 8,41 | 1,23 | 0,56 | |
| | | Channel bottom, silt gravel alluvium | 130 - 150 | 7,94 | 0,34 | 0,40 | 1380 ± 40 |
| Gobi brown soil | | | | | | | |
| CW - 04 | Haltariin huduu | “B” – Brown, silt stony | 0 - 20 | 8,16 | 0,51 | 1,28 | |
| | | “BC” – Reddish brown, silt stony | 20 - 40 | 6,87 | 1,53 | 0,12 | |

Present time on the channel and walls formed Gobi soil, morphological properties similar as surrounding Gobi brown soil. Very low organic content soil humus on the walls 0.51-0.53% down ward increasing. Channel soil more high organic content about 1.30-2.09 % due of lower position with more moisture accumulation and vegetation coverages. Sediment reaction is alkaline pH ranges 7.20-8.49. All sediment has a some calcium carbonate accumulations. This gobi arid region therefore soil sediment have alkaline and carbonate concentrations (Table 1).

Textire content mostly dominated sand fraction (Table 2). Specially fine sand fraction with 0.25-0.05 mm size. Fine sand is wind blown material. Sediment accumulation in chanells 120 cm and 130 cm. Accummulated mostly fine sand material. In profile CW-02 occurred some stone gravels. This site situated mountainues place, some stone gravels accumulated from upper slopes.

Nowadays height of Sartagtai wall is 1-1.5 m width 8-10 m, channel depth about 1.0 m. Channel bottom sedimentation trickiness is 120-130 cm. Original height of wall was 2 m, and channel depth was also 2 m, consequently total height of wall was about 4 meter high.

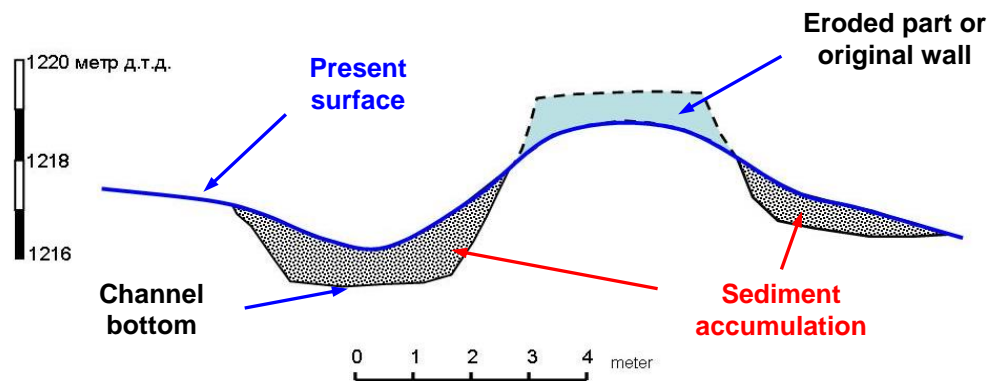


Figure 3. Sartagtai wall, channel schema.

Structure, schema, bottom channel sedimentation of Sartagtai wall proved that channel is not built as an irrigation channel.

Make a radiocarbon dating of soil samples in the buried soils of walls (profile No. CW-01) south-west part of Har-Us lake and chanell bottoms (profile No. CW-03) in “Haltariin huduu” south part of Hovd river. Radiocarbon analyze was made in Japan, Tokio Technological Institute.

Radio carbon (C14) dating of Sartagtai channel or Chingiss wall of Khovd aimag of Mongolia show that, wall was created 1370-1380 (± 40) year before present. This is end of Early Turk empire time (625-635 AD) and China Tan empire ruled in territory of Mongolia [6,7]. We are conclude, Sartagtai wall with channels constructed as a defense wall against nomadic tribes living in the Altai mountains. Sartagtai wall structure, size and age is similar as another Chingis walls in Eastern Mongolia and Gobi.

Table 2. Sartagtai wall and channel sediment texture % (size by mm)

| Profile No. | Depth cm | Medium sand | Fine sand | Coarse silt | Medium silt | Fine silt | Clay | Physical clay |
|------------------------|-----------|-------------|-----------|-------------|-------------|-------------|--------|---------------|
| | | 1-0,25 | 0,25-0,05 | 0,05-0,01 | 0,01-0,005 | 0,005-0,001 | <0,001 | < 0,01 |
| Wall | | | | | | | | |
| CW - 01 | 0 – 25 | 19,9 | 36,7 | 18,1 | 5,2 | 10,8 | 9,3 | 25,3 |
| | 25 – 50 | 20,2 | 25,9 | 23,9 | 9,2 | 6,7 | 14,1 | 30 |
| Channel | | | | | | | | |
| CW - 02 | 0 – 35 | 32,4 | 32,5 | 9,3 | 4,6 | 8,3 | 12,9 | 25,8 |
| | 35 – 70 | 22,8 | 59,4 | 5 | 3 | 3,7 | 6,1 | 12,8 |
| | 70 – 95 | 35 | 43,8 | 8 | 3,5 | 3,8 | 5,9 | 13,2 |
| | 95 – 120 | 5,6 | 13,6 | 20,4 | 17,1 | 22,6 | 20,7 | 60,4 |
| | 120 – 150 | 45,6 | 32 | 5,9 | 2,7 | 5 | 8,8 | 16,5 |
| CW - 03 | 0 – 10 | 33,5 | 54,6 | 4,7 | 0,7 | 2,6 | 3,9 | 7,2 |
| | 10 – 20 | 28,2 | 59,1 | 4,9 | 1,6 | 1,8 | 4,4 | 7,8 |
| | 20 – 40 | 26,4 | 62,1 | 4,1 | 2,8 | 1,2 | 3,4 | 7,4 |
| | 40 – 60 | 37,9 | 54,3 | 3,1 | 0,4 | 0,5 | 3,8 | 4,7 |
| | 60 – 80 | 42,3 | 47,5 | 3,8 | 2,4 | 0,6 | 3,4 | 6,4 |
| | 100 – 120 | 33,5 | 54,7 | 4,2 | 2,2 | 0,8 | 4,6 | 7,6 |
| | 130 – 150 | 39,1 | 33,1 | 8 | 1,8 | 8,1 | 9,9 | 19,8 |
| Gobi brown soil | | | | | | | | |
| CW - 04 | 0 – 20 | 8,3 | 8,5 | 43 | 5,1 | 14,6 | 20,5 | 40,2 |
| | 20 – 40 | 28,7 | 32,2 | 6,6 | 2,8 | 12,2 | 17,5 | 32,5 |

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