



Loneitute Tana Mizoram Sloping Agriculture Land Technology (MiSALT) Hmanga Huan Enkawl Dan



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GREEN LANDSCAPE IMPLEMENTATION UNIT, LUNGLEI, MIZORAM

Loneitute Tana Mizoram Sloping Agriculture Land Technology (MiSALT) Hmanga Huan Enkawl Dan

Mizoram dinhmun

Mizoram hi tlangram niin, mipui thahnem zawk chu loneitu/huan lama eizawng niin, thlai chinna tur hmunzawl tha erawh kan nei tlem hle thung a (a ram pum zau zawng 2% chauh hi hmun zawl a ni). A bak 98% vel hi hmun rualremlo leh awih (a awih zawng 33% aia awih) tlang leh ruam kara awm a ni. Huan thlai hmanga eizawngtu tam zawkte chu loneimi kan ni a, ruahtui tamna hmun kan nih avang leh kan loneih dan diklo avangin lei chunglang hang tha leh thlai leh rannung tawihral tur leh leitha a insiam turte chu, ruahtuiin min len bo saka, kan thlai thar a tlem pahin, kan lo te kum rei tak kan hmang theilo thin a ni. A bikin thal lain, huan enkawltuten tui tlakchhamna leh lei ro lutuk avangin harsatna nasa tak an tawk thin a ni.

Loneihdan tha zawk a awm thei em?

'Changkham' hi kan pi leh puten hmasanga an loneihna hmuna an lo hman thin niin, thing luang kang bang leh hnawmhnawk chi hrang hrang te awih tan zawnga lei luangral tur venhim nana an kham thin kha a ni a.

Sloping Agriculture Land Technology (SALT) hi huan enkawl dan chi khat Philippines ram tlangram loneihna hmuna hman atana tha a an fiah tawh a ni a. SALT ah chuan leithathing te awih tan zawngin contour line-ah tui leh lei luangral tur vennan phun thin a ni. Mizoramah chuan Baptist Kohhran ten Phillipines ram a an tihdan entawn a chawkluh a ni a, Mizoram chhimlama mi tlemte in an hmang mek a ni.

Loneih dan tha zawk a awm theih ringin Mizoram University leh Food and Agriculture Organization of the United Nation tangkawp chuan zirchianna an nei a 'Mizoram Sloping Agriculture Land Technology'

(MiSALT) hi a lo piang ta a ni. MiSALT hi *changkham* leh SALT a tihdan tha te Mizoram leilung awmdan mila her remin, tlangram awih taka hmantheih tura duan a ni.

Engnge MiSALT?

MiSALT hi Mizoram tlangram mil loneihna hmuna hman theih tura duan chhuah a ni a. Tlangram loneih dan tha pahnih - Mizoram ‘*Changkham*’ leh Philippines ram SALT te kaikawpin Mizoram tana tha tura duan a ni. MiSALT-ah hian *changkham* leh



SALT a tih thinte Mizoram leilung awmdan mila her remin, tlangram awih taka hman theih tura duan a ni. Hmun awih lutuk leh ruah tui tamna hmunah chuan a mala *changkham*/Contour Trash Bunding (CTB) emaw SALT emaw chauh hman hian a pahnih tlangkawp ‘MiSALT’ hi a tluk tak tak thei lova, tin, leilung a venhim thatdan ngaihtuahin a senso pawh hi a hautak lem lo a ni.

MiSALT hlawhtling taka kalpui tura thil pawimawh hmasa ber chu, lo hal zawh veleh lei chunglang luang ral tur leh ruahtui dangchat turin *changkham*/CTB te chu contour line-ah awih tan zawngin kham hmasak ber tur a ni. *Changkham* ti nghet turin a kham hrul hnuai chiahh hian SALT a an hman thin thlai/thingkungtê chi leh a dangte chu phun chhunzawm leh tur a ni. Heng thlai/thingkungtê chi kan phunte hi MiSALT ah chuan Very Important Plants (VIP) tih an ni a, VIP te hian mihring tan chawhmeh, damdawi a pe chhuak a, ranchaw leh lei a tiha

bawk a ni. *Changkham*/CTB a lei leh thildang in chhekkhawm chu, zawi zawia in belh zelin, kum engemaw zat hnuah chuan awih pangah terrace/hmun zawl a lo insiam ta thin a ni. Hemi avangte hian he thiamna pahnih inzawmkhawmin a siam MiSALT hi tlangram loneimi tana kan thlawhhma ten hlawk zawk leh hun rei zawk an tharchhuah theih nana kan tih makmawh leh kan hman ngei tur a ni. Tin, lei a tiṭha in, lei ro lutuk tur a veng bawk a, tin, kan tualchhung thlai leh chawhmeh ral mai tur min venhim sakin, nitin eizawwnaah nasa takin min puhruk bawk a ni. MiSALT siam hi a awlsamin a enkawl zui pawh a hautak lo bawk a ni.



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Changkham/CTB-a lei in chhekkhawm

Engvanginng e MiSALT kan thlan ang?

Enkawl leh siam hautak lo MiSALT hian mipui ei leh bar dinhmun tihhmasawn hi a tum ngawr ngawr a ni lova, an eizawwna in nghahna ber a ram leilung enkawl a, lo leh huante hun rei zawk hman anih theihna tura enkawlpu i hi a tum tlat a ni.

MiSALT huan neih hian thilṭha tam tak a thlen a, chungte chu:

1. *Changkham* a dahna tur hmun dik taka dah chuan lei luangral tur nasa takin a veng a ni.
2. Leilung hriselna a ti ṭha.
3. Leihnawwna belhchhahin leiṭha luangral tur a venghim bawk.

4. *Changkham* hrula VIP phunte hian chawhmeh te, damdawi te, ranchaw te, leiṭha te a pe chhuak a, bazara zawrh chhuah anih phei chuan sum lakluh a belhchhah bawk a ni.
5. *Changkham*-a lei inchhekkhawl hian laih chawp ngai lovin zawi zawiin awih pangah terrace/zawl a siam ṭhin a ni.

Engnge Contour Trash Bunding (CTB)?

Changkham tihchangtlun hi MiSALT ah chuan Contour Trash Bunding (CTB) tih a ni a, CTB ah hian thilnung lo chi hrang hrang (thing luang kâng bang/ thing leh thlai zar leh hnah tla/balhla kung /mau /lung etc) lei luangral tur dang chat thei thilte chu ruah sur hmains lei si chatin kham nghal tur a ni. MiSALT hmanga CTB kan siam hian lei luangral tur vengin, lei a tihnawnga, lei a tiṭha bawk a ni. CTB ah hian lei leh tui te a pût rûk lohnan hnawhphui vek tur a ni.

Changkham/CTB siam dan

1. Lo vah/hal zawh veleh A-Frame (a siam dan Annexure I ah en tur) hmangin contour line hi chhinchhiah hmasak vek tur a ni a. Contour line-ah hian *changkham*/CTB kham tur a ni.
2. CTB/*Changkham* ah hian thilnung lo chi hrang hrang (thing luang kâng bang/ thing leh thlai zar leh hnah tla/balhla kung /mau /lung



etc) lei luangral tur dang chat thei thil te chu ruah sur hmains lei si chatin kham nghal tur a ni.

3. CTB/*Changkham* te hi mau emaw thingtuai emaw hmangin 1-1.5m inkardanah CTB in karchehin khen ngheh vek tur a ni. A hmun hma awih dan a zirin CTB pahnih inkarhlat zawng hi a zau berah 5m a ni tur a ni, a awih nasat dan a zirin a inkar hi tihzim hret hret tur a ni, CTB pahnih inkarah hi thlai chin theihna tur a zau tawk a ni tur a ni.
4. Thlai chin tur a zirin CTB pahnih inkarah hian CTB tawi têt têt VIP tel leh tellovin a dah theih bawk a ni.
5. Huan hnawmhawwk (thlai kung leh hnah paih tur te leh hnim te. etc) te CTB-ah chhekkhawm thin tur a ni.
6. Tichuan, CTB a huan hnawmhawwk kan chhekkhawm te chuan thal laiin thlai chinna hmun te chu khuh thin tur a ni, hei hian lei a ti hnawngin a ti hrisela, kan thlai tharte hlawk phah bawk a ni.
7. *Changkham*/CTB te kumtina siamthar reng ngailo tur leh kum engemawzat hnu a CTB thlak turin, a thlang chiahaah VIP kungte tlarkhat tlatin phun tur a ni.

Engge Very Important Plants (VIP) te chu?

VIP kan tih te hi chi hnih (2) a awm a, chungte chu:

- VIP – Tualchhung thlai/thingkung têt chi/thingkung te
- VIP – Leithathing te (Nitrogen fixing tree species/NFTs)

1. Very important plants (VIP) te chu thlai leh thingkung têt chi kum hnih thum dam leh kumhlun te an ni a, heng thlai te hi chawhmeh te, damdawi te, leitha te leh ranchaw atana kan hman thinte an ni tlangpuia, tin, tualchhung thlai leh thing ral mai tur vawn himnan leh lei leh tui luangral tur venghimtu an ni tel bawk.
2. VIP (Tualchhung thlai/thingkung têt chi te) te hi CTB hnuai chiahaah a kung leh kung inkar hlatzâwng 1ft atanga 4ft (VIP thlai azirin) CTB dawl tur leh lei luangral tur veng tur leh lei ti hnawng turin phun tur a ni.

3. VIP (Leithathing te/NFTs) entirnan *Tephrosia candida*, *Flemingia macrophylla* etc te hi a chung chiaha kan sawi tak VIP (Tualchhung thlai/thingkung t  chi te) inkarah hian tlar khat tlatin a kar awl hnawhkhat turin chin bawk tur a ni

Loneitute VIP duhzawng thenkhatte chu Phuihnam (*Clerodendrum colebrookianum*), Ching t (*Zanthoxylum rhetsa*), Pelh (*Gnetum gnemon*), Kawhtebel (*Trevisia palmata*), Khanghu (*Acacia pennata*) etc. (*Annexure – II lo en la*)



VIP – *Clerodendrum colebrookianum*

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VIP enkawl dan

1. VIP (Tualchhung thlai/thingkungt  chi te) te hi a hun bi mumal takah a sanz wng 1m-2m p l lo turin hlawi then thin tur a ni.
2. VIP te hi a   bit lutuk tur vennan suat then thin tur a ni.
3. VIP suatna leh hlawina te hi CTB/changkham ah chhekkhawm thin tur a ni, a  awihral hnuah thlai tan leithaah a hman theih a ni.

4. VIP te kâng chhe lo turin a kung hnaih lutukah huan hnawmhnawk te hâl ðhin loh tur a ni.
5. VIP (Tualchhung thlai/thingkungtê chi te) te hi CTB/*Changkham* thlangah a kung leh kung inkar hlatzawng 1-4ft vela phun tur a ni.
6. VIP (Leithathing te/NFTs) entirnan *Tephrosia candida*, *Flemingia macrophylla* etc te hi a chung chiaha kan sawi tak VIP (Tualchhung thlai/thingkung tê chi te) inkarah hian tlar khat tlatin a kar awl hnawhkhat turin chin bawk tur a ni
7. VIP (Leithathing te/NFTs) te hi hunbi mumal takin a sânzâwng 1m – 1.5m aia sang lo turin hlawi ðhin tur a ni.



VIP – *Tephrosia candida*, *Acacia pennata*

MiSALT Calendar

Sl. No.	Particulars	Month
1.	Lo vah/hal leh CTB tur lakkhawm	March - April
2.	Contour line chhinchhiah	April
3.	CTB contour line-a kham	April
4.	CTB inkara thlai chinna tur buatsaih	April - May
5.	CTB inkara thlai chin	April - June
6.	VIP thlai/ thingkungtê/ thingkung/ leiṭhathing (NFTs) chin/phun	May - June
7.	VIP thlai/ thingkungtê/ thingkung te hlawi	VIP ten CTB inkara thlai te a zâr hlih dawn emaw a kung 1m-2m aia a sân chuan hlawi tur (a ṭul danin kumtluanin enkawl tur)
8.	VIP leiṭhathing (NFTs) te hlawi	A kung sânzawng 1m-1.5m a awm turin hunbi neiin kumtluana hlawi tur. A chi chhuah tura a duh anih chuan, a chi a puitlin huna hlawi mai tur.

MiSALT Research Terminal Report – MiSALT research Team, Mizoram University, Aizawl, Mizoram

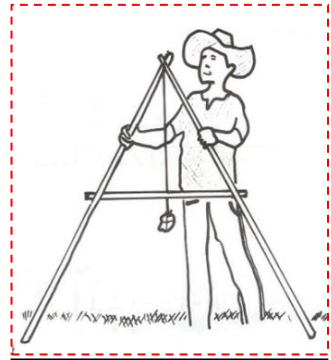
MiSALT IEC Brochure-2 – Facilitator’s companion to Mizo Sloping Agriculture Land Technology (MiSALT)

*Annexure - I***Contour line chhinchhiahnana A-Frame siamdan:**

1. Thing/Mau tlawn 3 (pathum) nei hmasa phawt la, tlawn 2 te hi A-frame kê turin 1.5m a sei a tan ve ve tur a ni. Mautlawn pakhat la bang chu 1m a seiin A-frame phuar nghettu a hman turin tan leh tur a ni.
2. A-frame siam turin, mautlawn pahnih 1.5m seia tan sa te kha, hmun zawlah a ke pahnih inkar hlatzawng 1m vela dahin, a chhipah nghet taka ÷awn khawm tur a ni, mautlawn 1m a seia tan sa kha mautlawn pahnih tinghet turin a khampheiin nghet takin A-hawrrawp siam turin ÷awn beh tur a ni.
3. Tichuan, A-frame chhipah chuan lung/plumb bob khaina tur hruin seitak ÷awn beh tur a ni.

A-frame hman theih tura tihdik dan:

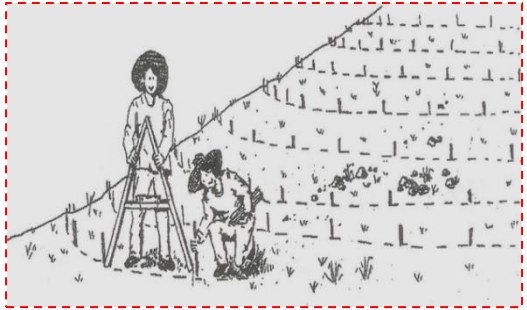
1. A-frame siam tawh sa chu hmun zawlah dah la.
2. A-frame chu ngil taka chelh dingin, a khamphei a mautlawn ÷awnbehna hruiin a tawhna lai kha pencil in chhinchhiah tur a ni. A-frame hûnna ke awmna kha in thlakthlenga her kual leh tur a ni a, mautlawn khamphei a hruiin a tawhna lai tak kha chhinchhiah leh tur ani.
3. A hmaa kan chhinchhiahna pahnih inkar chiah kha a level dik tak a ni a, chhinchhiah tur a ni a, hei hi a ‘level-mark’ chu a ni. A chhinchhiahna pahnih te kha a ngai chiah anih chuan, a ‘level mark’ a hman nghal theih a ni bawk.



©Source:
<https://www.semanticscholar.org/paper/Agricultural-technologies-for-marginal-farming-in-Malla/3cc06acac256fead84f97bec3e4ee2f575c9dc10>

Contour line chhinchhiah dan:

1. A-frame hman hmawlh tawi têt têt 30cm vela sei lakkhawm hmasak tur a ni.
2. Hmun awihah chuan huan/lo lu lam aţangin, a kil sir khat a teh ţan tur a ni. A-frame ke pakhat chu nghet taka leiah nghah tur a ni a, a ke nghahna chu hmawlh hmanga



©Source: <https://www.semanticscholar.org/paper/Agricultural-technologies-for-marginal-farming-in-Malla/3cc06acac256fead84f97bec3e4ee2f575c9dc10>

3. A level mark-a hrui a awm hunah hmawlh hmangin a ke lehlam awmna chu chhinchhiah leh tur a ni. Hetiang hian a ke pakhat chauher kualin a hma a kan tih ang chiahin tih chhonzawm tur a ni.
4. Tichuan, awih tan zawng a A-frame hmanga hmawlh te a line siam chu contour line kan tih chu a ni. Contour line siam hian a sâng lutuk emaw a hniam lutuk lai te awm thei a ni a, hetiang a awm anih chuan a remchan danin siam ngil chawp mai tur a ni.
5. A contour line dawt chiah hre tur chuan, bân pakhat khamphein ngil taka pharin, hnungzawnga chhuk tur a ni, a hmaa contour line siam tawh sa nena i banphar a in zawl chiah hunah, chulai hmun chu contour line dang lak lehna tur a ni.
6. Contour line pahnih inkar hi 5m aia zau lo leh 3.5m aia zim lo a ni tur a ni.

Annexure II

VIP-te Chanchin Tlangpui

A. VIP – Thlai/Thingkungtê/Thingkung

1. **Botanical name:** *Acacia pennata* syn. *Senegalia pennata*

Local name: Khanghu

A nihphung: Hei hi tropical hmun a ʈo ʈin niin, thingkungtê chi, a sânzawng hi 5metre (16 ft) vel a ni thei a ni.

A hmanna: A hnahno te hi chawhmeh tui tak a ni a, a chhum leh a kan siam a ei ʈin a ni. A hnah te chu a hling a chhuaha a chan hmains ei a ni tlangpui ʈin. Mizoram chhunga bazarah zawrh vek a ni.

A tihpun dân: A chi leh a zâr vih phuna tih pun ʈin a ni.



2. **Botanical name:** *Amomum dealbatum*

Local name: Aidu

A nihphung: Aidu hi thlai kumhlun leh pianʈo ʈha tak a ni a, 3m vela sânzawng niin, zung puak tam tak a nei ʈin a ni.

A hmanna: Aidu ria, a par leh a rah te hi chawhmeh atana hman ʈin a ni. Mizorama bazarah chuan zawrh vek ʈin a ni.

A tihpun dân: A chi aʈang leh a zung puak hmanga tihpun ʈin a ni.



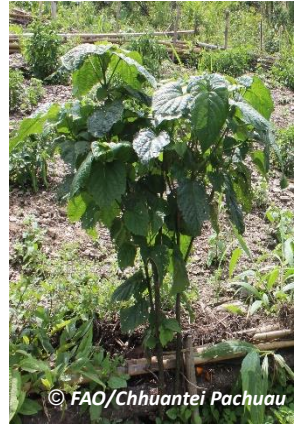
3. Botanical name: *Clerodendrum colebrookianum*

Local name: Phuihnam

A nihphung: Phuihnam hi thingkungtê chi kumhlun a ni a, 4 – 8ft vela sang a ni thei bawk. India hmarchhak ah chuan damdawi atan chawhmeha hman òhin a ni.

A hmanna: A hnah hi chawhmeh atan leh BP sang enkawlna damdawi atan a chhum a ei òhin a ni.

A tihpun dân: A chi leh a zar vih phun hmanga tih pun òhin a ni.



4. Botanical name: *Dysoxylum gobara*

Local name: Thingthupui

A nihphung: Thingthupui hi hnah tlakawlh vek ngai lo a ni a, a sânzawng hi thingkungtê chi leh thingkung lian chi 35 metre vela sâng pawh a ni thei bawk. Chawhmeh leh damdawi atana hman òhin a ni a, Philippines-ah chuan a thinghâwng chhum tui hi luak ti chhuak tura damdawia hman òhin a ni.

A hmanna: A hnah no hi chawhmehah a chhum leh kan in hman òhin a ni. Mizoram bazarah chuan zawrh vek a ni.

A tihpun dân: A chi hmang chauha tihpun òhin a ni.



5. Botanical name: *Gnetum gnemon*

Local name: Pelh

A nihphung: Thingkungtê chi atanga lian ve deuh a ni thei a, a sânzawng hi 15 – 22 metre a sâng a ni thei bawk.

A hmanna: Mizoramah chuan Pelh mu te hi a chhum, rawh leh kan ten ei ðhin a ni. A hnahnote leh a rahte hi chawhmeh a hman ðhin a ni bawk. Mizoram chhimlam bâwm a ni.

A tihpun dân: A chi leh a zar vih phun a tihpun ðhin a ni.



6. Botanical name: *Parkia roxburghii* syn. *Parkia timoriana*

Local name: Zawngt̄ah

A nihphung: Zawngt̄ah hi hnah tlakawlh vek ðhin a ni a, thingkung lian tak niin 50 metre vela sang a ni thei. A thingkung lenzawng tan tlang hi 51cm vela lian a ni thei a ni. Thing lian anih vangin lo sirah, thlai dang hliah lo turin phun ðhin tur a ni.

A hmanna: A rah hi a ei theih a, Mizoramah chuan chawhmeh lar leh tui tak a ni. Tin, a rah hi pile thi enkawl nan hman ðhin a ni, a thinghâwng tui hi kawt̄halo leh santên damdawi atan hman ðhin a ni bawk.

A tihpun dân: A chi hmanga tihpun ðhin a ni.



7. **Botanical name:** *Trevisia palmata*

Local name: Kawhtebel

A nihphung: Kawhtebel hi hnah tlakawlh ngai lo, 15 – 20 feet a sâng niin, zâr tlemtê emaw zâr nei lem lo emaw a ni. A hnah hi a hlai em em a, 1 – 2 ft vela hlai a ni òin. A zik no hi rawng uk lam emaw tuiêk rawng niin, sam leh hling tamtak a nei bawk. Mizoram ah chuan ramhnuaiah a òo ber òin.

A hmanna: Mizo chuan a par leh a rah no tê tê chawhmehah a chhum leh kan in hman òin a ni. Khawchhung bazarah chuan zawrh vek a ni.

A tihpun dân: A kung/zâr chang tawh hmanga, lei pan te a phuma a tihpun òin a ni.



8. **Botanical name:** *Zanthoxylum rhetsa*

Local name: Chingit

A nihphung: Thingkung zar pharh òa tak, hnah tlakawlh vek òin a ni a, 35 metre vela sâng a ni. Thing bul lian tak a lenzawng tantlanga 75cm vela chhah a ni bawk. Mizoram lo ah chin/òo òin a ni.

A hmanna: A hnahno te hi chawhmeh a hman òin a ni.

A tihpun dân: A chi hmanga lo thara lo òiak òin a ni. A chi hian kawr sak deuh a nei a, a chi kui òiah dawn chuan a rah hmin veleh a kui nghal òin tur a ni. A chi dah òhatte chu tihdân chi hrang hrang hmanga sawngbawl hmasak a ngai òin.



B. VIP – Leithathing (NFTs)

1. Botanical name: *Tephrosia candida*

A nihphung: Thingkungtê chi thangduh tak a ni a, tropical leh sub-tropical hmunah te to thin a ni. India ramah chuan Himalaya tlang bulthutah a tualto thin. Mizoramah chuan kum 2004 khan Baptist Kohhran ten Sloping Agriculture Land Technology (SALT) an lakluh kum khan an rawn chaw lut a, Mizoram chhim lamah chin pun a ni.



A hmanna: Leichhe hmun leh lo neihna hmunah te, lei tih thatnan leh lei luangral tur veng turin Mizoramah chuan chin/hman thin a ni. He

leithathing hian leichhe hmun a ti tha in, boruaka nitrogen leitha hmang tangkaiin thlai tan leitha a siam thei a, lei luangral tur a dangchat thei bawk a, lei a ti tha bawk a ni. A hnah leh zâr hlawina te hi lei khuh hnawnnan hman a ni bawk.

A tihpun dân: A chi hmanga tihpun thin a ni. A chi hi darkar 4-5 vel tuilumah chin anih hmain chiah thin tur a ni a, ruahtui tlak hma hret emaw ruahtui tlak laia chin thin tur a ni.

2. Botanical name: *Flemingia macrophylla*

A nihphung: Hei hi thingkungtê chi kumhlun leh zung kai thuk tak a ni a, hnah buk tak 0.5 – 2.5metre vela sang a ni bawk. Phun aṅanga thla 6-7 velah a par ṅhin. Kum khatna-a a chi chhuah hi chu a tam vak lo. Hlawi a dawl êm êm a, hlawi hnua hian a chawr



no leh zung zung ṅhin. Leithur leh lei chhia a ngam êm êm a ni. Baptist Kohhran ten kum 2004 khan Mizoramah an rawn la lût a ni.

A hmanna: A kung hi contour line-ah a tlarin lei luangral tur dangchat tura hman ṅhin a ni. A zar leh a hnah hlawina te hi lei khuh hnawnnan hman ṅhin a ni a, boruaka nitrogen leiṅṅa hmang ṅangkaiin thlai tan leiṅṅa a siam thei bawk a ni.

A tihpun dân: A chi hmanga tihpun ṅhin a ni. A chi hian kawr sak deuh a neih avangin ṅiak ṅha tur chuan sawngbawl ve deuh a ngai ṅhin a, a chi hi tuiso lek lekin leiṅṅ tur a ni (chhum hmin lovin) chumi hnua hian tuilum in darkar 12 aṅanga 24 chiah leh tur a ni. Heng thingkung hi a chawr duh êm êm a, a kung kih hian hmun tamtak a chawrno ṅhin a ni.



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