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SCHOOL OF AGRICULTURE AND RURAL DEVELOPMENT
ersj vt`k D>gy3 wekte`ij q

BAE 1201

Kwl .cwi wPwZ I cwi tek
INTRODUCTORY AGRICULTURE AND ENVIRONMENT

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Gi Qv t` i Rb` gwZ ntqtQ|



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Introductory Agriculture and Environment
BAE 1201

Kw. .I cj # Dbqb ~j
SCHOOL OF AGRICULTURE AND RURAL DEVELOPMENT



ersj vř` k D>gŷ nek|e` ij q

Kul. cni PwZ I cni tek

(KRISHI PARICHITI O PARIBESH)

INTRODUCTORY AGRICULTURE AND ENVIRONMENT

মুদ্রিত বই

মুদ্রিত *চৌদ্দমি* *W. Areytnbr tgrt dvi k*
ersj v`k Dbk nekpe`ij q
মুদ্রিত *W. Gg. Numbjyn*
G.U.W.W.C.; Gd.G.I
W. tgrt tZuchaj Bmjvg
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ersj v`k Dbk nekpe`ij q

মুদ্রিত ZËyartb

Wib

Kul. I cni Dbqb`z

ersj v`k Dbk nekpe`ij q

KRISHI PARICHITI O PARIBESH (Introductory Agriculture and Environment), a 2-Credit Coursebook for the Bachelor of Agricultural Education Programme, Written by Dr. Md. Sultan Uddin Bhuyia and Dr. Md. Abdul Halim Khan, Edited by A.K.M. Ashraful Alam (2nd edition), Dr. Md. Tofazzal Islam and Md. Sorowar Hossain Chowdhury (1st edition), Style Edited & Cover Photograph Provided by Dr. Md. Tofazzal Islam, Published by Publishing, Printing & Distribution Division, Bangladesh Open University, Gazipur-1705. © Bangladesh Open University. First edition : December, 1996, Second edition : April, 2004. Publication Time : 2013. Computer Compose & D.T.P: Md. Al Amin (2nd edition), Kazi Md. Giasuddin & S.M. Mizanur Rahman (1st edition). Cover Design : Md. Monirul Islam. Illustration : Md. Raisul Islam Khan. Printed by : Business Printing & Pakaging, 14-15, Padmanidhi Lane, South Sosandi, Dhaka-1100.

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ciW ibt` Rbv

ÔKul. cwiuPuz I cwiitekô tKimeBilU netklfite Kul. I cju Dbqb `ç Gi weGWRGW tcôMôgi Qvîti` i Rb" tj Lv ntqtQ| Avcib Rvbb, ` i ukŋŋtY ukŋŋtKi mveŋŋiYK Dciv`wZ tbB| ZvB cvtVi tKvtr Kulb weq thb Avcbri eštZ Amyeav bv nq tmv`tk `wó tišLB tKimeBilU tj Lv ntqtQ| tKimeBilUi AmizK I Dc`vcbr ZvB cŋwZ cv`eB t_ŋK wkQy wfbae aiŋbi | thŋnZmivmvi ukŋŋtKi mrvnh" QvovB tKimeBilU AvcbrtK ubtR cto eštZ nte, ZvB GiU Kxfite coŋeb cûŋgB Zv trtb ubb| GtZ tKimeBilU cotZ I eštZ Avcbri mveav nte|

eBilU ijtLiLv



ÔKul. cwiuPuz I cwiitekô tKimeBilU `ŋU Astk wef³| cûg AskulU iktivbvq ÔKul. cwiuPuzÔ Ges wZxqiu Ôcwiitekô| cûZilU Ask Avevi wZbiiU Kti BDibtu wef³| cûZilU BDibtu GKwAK cvV itqtQ| cvV msL"v ubaŋY Kiv ntqtQ cûZilU BDibtuI weqe`i I ci wofP Kti| BDibtuI cvV.ŋjvŋK Avjv`v Kti mvrtrbv ntjI Gt`i gta" GKulU thvMmT itqtQ| GtZ Avcib BDibtuI i ištZB trtb hvŋZQb cvtVi gjy Avtj vP`mŋP Kx?


cvVi Dtik`


j ŋ" Kiteb cûZilU cvtVi i ištZ GK ev GKwAK mŋv" ō Dtik` t`qv AvtQ| cûZilU Dtik`tk tK>` KtiB cvtVi weqe` mnRfite eYŋv Kiv ntqtQ| cvV tkŋl cvtVi Dtik`, ŋjv ARŋ Kiv mæe ntqtQ Kx bv Zv ubtR ubtRB gj`vqb Kiteb| Gi Rb" cvV tkŋl `ŋjv`vqb cŋe itqtQ| GtZ Avcib cvViu KZUKzeštZ cviŋj b Zv ubaŋY Kitz cviteb|

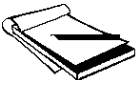
AvBKtbi e`envi

cvtVi weqe`ŋjv GK`wôtZ etš tbqvi Rb" cŋqvRb Abyvŋti tKimeBilUi wefwbaeRvqMvq wefwbaeaiŋbi cŋZxK ev AvBKb e`envi Kiv ntqtQ, hv t`šL Avcib mnŋRB weqe`i Dc`vcbr Ges Avcbri KiYxq Kx Zv eštZ cviŋeb| ubtæG tKimeBtq e`euZ wefwbaeaiŋbi AvBKtbi A_ŋbt`R Kiv ntjvŋ

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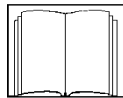
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= cvtVvEi gj"vqb



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cvtVi i_ycYkYxq AskK Avi I AvKIYxq Kti c0k#bi Rb" gvtS gvtSB
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Ges gtb ivLtz tPov Kily|

Abjxj b

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RvqMvq t`qv itqtQ Abjxj b| Abjxj b,tjv AvcbvK mgrav KitZ nte| Gme Abjxj b
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Povšl gj"vqb

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Amvav nte bv|

BDibU 1 ejsj v`tki Kult fig, Rjevqyl dmj Drcv`b

**BDibU 1
ejsj v`tki Kult
fig, Rjevqyl
dmj Drcv`b**

Avenl qvi Zvi Ztg`i
wfvE`Z dmj Drcv`b Lwi c-
1, Lwi c-2 I iwe - GB wZb
tgSm`tg nef³ Kiv nq|

ejsj v`k Kul c`vib t`k| Gf`tki A_`omZ Kul i Dci wbfP`kxj | ZvB Gf`tki mg`IKgRvU
I Dbq`b Kul t`K tK`^a KtiB AvenZ`Z nq| ejsj v`tki mvgwM`K DbwZ I mgw`x Kul. Dbq`tbi
mstM I Zic`OZfite RwoZ| t`fSm`uj K Ae`vbMZ Kvi tY Gf`tk tgSm`gx evqy c`fve c`Pz
epocvZ nq| AwZwi³ epocvZ I DEivAj t`tK AvMZ b`-b`xi Xtj tKvb tKvb eQi eb`v
t`Lv t`q| elP`Kv`j cOZ eQi b`-b`xi metaS`Z AA`tj c`Pz cwi cti| dtj b`-b`xi metaS`Z
AA`tj i gwU `fveZtB tenk DeP`| ejsj v`tki Rjevqyngfveicb`f cOq mvi v eQiB tKvb bv
tKvb dmj R`tb`f| eQti i tKvb mgq Kx aitYi dmj Rb`v`te Zv Rjevqy wewf`b`eDcv`v`tbi
Dci wbfP`kxj | Ab`w`tK dmj Drcv`tbi Rb` Rwg Pvl, exR ecb ev Priv t`ivcY, wbovbx
t`qv, tmP cOqvM, Avc`bvkK wQuv`bv t`tK i`iyKti dmj KZ`B, gvoivB, cOqvRvZKiY,
BZ`w` Kvr` t`j v`K Avenl qv c`fvev`S`Z Kti | Avenl qvi Zvi Ztg`i wfvE`Z dmj Drcv`b
Lwi c-1, Lwi c-2 I iwe - GB wZb tgSm`tg nef³ Kiv nq| Lwi c tgSm`tgi me dmj B epO
wbfP`| iwe tgSm`tg tmP cOqv`Mi gva`tg tevtiv avb I Mtgi Aven` Kiv nq|

Gf`tki Kul. GLt`bv A`tbKvst`k c`KwZi tLqvj L`yki Dci wbfP`kxj | th eQi AvkivZixZ
epocvZ nq Ges tKvbifc cO`KwZK `h`P`M dmtj i q`wZ nqbv, KIK tm eQi Avkivbj`f`c fij
dj b cvq| Zv bv ntj gvtVi dmj nwi`tg Zv`tK A`tkl q`wZ I `y`Rvi m`P`x`b nO`Z nq|
Gf`tk Kl`tKiv GKB Rwg`tZ m`vaviYZt eQti `O`U dmj Aven` Kti `v`tK| Zte tm`tPi
m`y`av `v`Ktj tmL`v`b wZb`wU dmj I Pvl KitZ cvti | Dch`y` cwi`tek, fij ex`t`Ri e`envi,
m`y`g gv`v`q mvi cOqvM I mgqgZ Avc`bvkK e`envi dmtj i dj b emotq t`q| ejsj v`tki
A_`omZi gj- PmeKv`w`v` ntj v Kul. | Kul i mO`z`l meP`x`b DbwZi DciB RvZixq A_`omZi w`Kiv
I DrKI wbfP` Kti | ZvB ejsj v`tki Kul i `i`z`i Acwi m`xg|

GB BDibU QqvU cvtV ejsj v`tki Kul. Z`v Kul i avi Yv, figi c`KwZ, Rjevqy Rjevqy
c`fve, fig I Kul. DcKi`tYi e`envi Ges ejsj v`tki A_`omZ`tZ dmtj i Ae`vb BZ`w`
m`P`t`U w`v`w`i Z Avtj vPbv Kiv ntq`tQ|

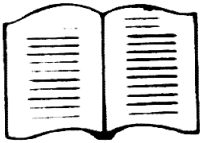
cw 1.1 Kul.i aviYv I , iZj Ges ersj v`tki figi cKuz.



G cvV tkfI AvciB

- ◆ Kul.i aviYv e`vL`v Ki tZ cvi`teb|
- ◆ Kul.i , iZj e`vL`v Ki tZ cvi`teb|
- ◆ figi cKuzi `tfc iPiYz Ki tZ cvi`teb|

Kul.i aviYv I , iZj



“Guj`vUj kã ‘Ager’ Ges ‘Cultura’ Gi mgštq “Agriculture” ev Kul.MvZ| ‘Ager’ A_®Rig Ges ‘Cultura’ A_®Pvl Kiv| ZvB kvãK A_®Kul. ntjv Rig Pvl Kti dmj Drcv`b| wKŠ`mgtqi e`eavtb Kul.m`fU gvbjI i mngZ aviYvi I me`hZ NtUq| eZgvtb Kul.ej tZ fig KI® Z_v Rig cŠZKiY I e`e`rcbvi gva`tg wefbaecKvi km“, dj-gj-, MvQ-cvjv, kvK-mwã I dz, ci I ciRvZ `e” Ges grm” Drcv`b tK eSv`tv nq| iay Kul.ZZB (Agronomy) Kul.meAvb bq| th mKj me`vi e`envi Øvi v Drcv`b Kv h`m`ubæ n`q _v`K tm me_tjvB Kul.meAvbi AŠf`| Avi tm_tjv n`Q km” Drcv`b (Crop Production), ci Cij b (Animal Husbandry), ci iPiKrmv (Veterinary Science), Kul. cŠKŠk (Agricultural Engineering), Kul. A_®mZ (Agricultural Economics) Ges Zrmsuk-ó melqmw`| GK K_vq gvbjI Lv`, e`i, evm`vb, JIa Ges mmeR g`j v`t` cŠqvRbxq tgšj K Dcv`vb , tjv Drcv`tb cŠqvRbxq `eAvbK AvbB Kul.meAvb|

Kul.gvbjI i tgšj K Pwn`vej x h_v Lv`, e`i, Avk`qi tgšj K Dcv`vb , tjv i thvMvb t`q| Kul.i Dbq`bi mvt_ mvt_ t`tki A_®mZK Ges mvgmRK Ae`vi DbmZ NtU| Kul. ersj v`tki RvZxq DbmZ I mgw`xi tgiYU| ØRvZxq DbmZ I mgw`x ntjv MvQi b`vq| Kul. ntjv Zvi gj-, wkí Zvi kvLv Ges emYR” Zvi cvZv| g`j ¶Z t`Lv w`tj Zv mg`l MvQv tK aYsm Kti t`qOÑ Pxbv G cëv`u Kul.wb fP ersj v`tki Rb” LgB cŠhvR” | ersj v`tki mmeR DbmZ I mgw`x m`gZKul.Dbq`bi m`t½ ubweofvte m`ú” | gvbjI i Av`tZj mvt_ RvZ Kul.i , iZj cY`Ae`vb , tjv ubtæ D`tj Kiv ntjv:

- gvbjI i tetP _vKvi cãvb DcKiY ntjv Lv`Ñ hv Kul.t`tK Avtm|
- Kul.wkí i KvPvgvtj i cãvb Dm |
- Kul.t`tki i vRt`t cãvb Dm|
- Kul.gvbjI i RmeKvi Dm |
- Kul.cY” Avg`vb i Bvbi gva`tg wefbae`tki gta” AvŠRmZK m`úK Mto D`v |
- Kul.Rvj vbi Dm|
- evm`vb I Avmeec`I `Zwi tZ Kul i Ae`vb Ab`Kvh®

Rtbfi ci t`tK gZzchŠ| Kul.i m`t½ gvbjI i ubweo m`úK`i tqtQ| gvbjI i tetP _vKvi Rb” Kul.c`Y`i Dci GKvŠf`vte wbfPkvj nôtZ nq| AZGe Kul.i , iZj Acwi mng|

evsjv`tki figi cKuz.

mravi Yfvte evsjv`tki cġq 87 fVM mgZj fig Zte fZtj i mgZv GKBi/c bq| fZtj i mgZvi wfvE`Z mgMġevsjv`kġK cvBv fVM fVM Kiv ntqġQ| G, tjv ntjv t

1| DġZfig

Gj/c RġgtZ eIġ cwb Rtg bv| AvBj w`tg cwb AvUwKtg dmj DrcbġKiv nq| gaxj I fvl qvtj i Mo Aġj, ivRkvx, w`bvRcj I iscj i AšMZ efi>`Aġj, Kġgj w jvj gvB Aġj Ges wmtj tUi wUj v Aġj wbtq DġZfig MvZ| G Aġj i gġEKv cġPxb cjj ōviv MvZ nI qvq GġK ōcġPxb cjj figō bvtgI AvfvinZ Kiv nq| GLvbKvi gġU jvj eġYġ I Kġi hġ| GLvġb mravi bZ MRvvi, kij, P, bvbv iKg dj, tivcv Avgb avb, wvrfbġkvK-mvġ fij Rġbġ| DġZfigi tgvU AvqZb 23,300 eMġKtj wġUvi |

DġZfig Aġj i gġEKv cġPxb cjj ōviv MvZ nI qvq GġK ōcġPxb cjj figō bvtgI AvfvinZ Kiv nq| GLvbKvi gġU jvj eġYġ I Kġi hġ|

2| ga`g fig

GB Aġj Rġgi cwb AvBj ōviv wqġšZ nq| w`bvRcj, iscj, ivRkvx, e, ov, Kġqv, hġkvi, Ljyv, gqgbvmsġni wKŲAsk, XvKvi Dġi vsk, ewi kij, I wmtj tUi wKŲAsk, Kġgj -v, tbrqvLwġ I PġMġgi cevġj wbtq ga`g fig MvZ| AvDk avb, Avgb avb I cvU G Aġj i cġvb dmj | Gi tgvU AvqZb 62,133 eMġKtj wġUvi |

3| wPZfig

G Aġj eIġKtj mravi YZt 3-4 dġ cwb nq Ges tKvb tKvb mgq cwb i D`PZv `vovq 10-12 dġ| cvebv I dvi`cj tRjvi AvġKvsk Aġj, XvKvi tRjvi `wġbvsk, Kġgj w I tbrqvLwġ tRjvōtqi cġġgisk, e, ov, Ljyv I wmtj tUi wKŲAsk wbtq G Aġj MvZ| wQvUtg tevrv Avgb, AvDk, cvU I iwekm` G Aġj i cġvb dmj | Gi tgvU AvqZb 34,950 eMġKtj wġUvi |

4| AZ`šwPZfig

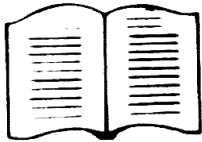
t`tki wvrfbġvġb Aew`Z wej, nvl i I b`x bvjvi Zxi eZġGj vKvmgv wbtq G Aġj MvZ| eIġKtj G Aġj cwbġZ wġvġZ `vtK Ges wvU nġi gZ t`Lvq| eIġKtj Gmg`I GjvKvq cwb i Mfvi Zv 30 dġ chšġnōtZ cvġi wKš`kvZKtj ga`vb e`wZZ Ab`vb i wKtg hvq| i we tġšmġg tmtPi mrvġth` GLvġb tevġiv avb Kiv hvq| G Aġj i AvqZb 4,142 eMġKtj wġUvi |

5| cvvvo Aġj

cveZ` PġMġg, PġMġg tRjvi wKq`sk, Kġgj w tRjvi jvj gvB Aġj, wmtj U tRjvi `wġY-ceġsk, tbrqvLwġ tRjvi Dġi cevsk Ges gqgbvmsn tRjvi Dġi-ceġsk wbtq G Aġj MvZ| AġbK, tjv tQvU eo cvvvo, wUj v Ges Gġi cv fig wbtq G Aġj MvZ| PġMġg Ges cveZ` PġMġgi cvvvoqv Aġj B evsjv`tki GKgvI w`ġY`cvvvo GjvKv| GLvbKvi cvvvo i mġeP Pġv wKtqv vlvv i Gi D`PZv 1,232 wġUvi | cġq mg`I Aġj B eb Rġtj AveZ| GLvġb Avbvi m, Kvġj fij nq| AvqZb 18,122 eMġKtj wġUvi |



Abġj b (Activity): f, Ztj i mgZvi Dci wfvE` Kġi mgMġevsjv`kġK KZ fVM fVM Kiv ntqġQ Ges Kx Kx? Avcbvi GjvKvi gġU Kx atġbi? Gi `evkō` , tjv wġ Ljy|



mvigg®

Kwl.ejtZ Riq c0`ZKiY I e'e`rcbri gva'tg newfbæcKvi km", MvQ-cijv, dż, djgj-, kvK-mwâ, ci I ciRvZ `ê`w` Ges grm" Drcv`btk ešvq| Kwl. gubtj i tgšwj K Pwn`vejxi thvMvb t`q| ZvB Kwl.i ,ižjAcwi mvg|

mvavi Yfvte ersj vt`tki c0q 87 fvm mgZj fig Zte fZtj i mgZv GKBi/c bq| fZtj i D`PZv Abymti ersj vt`tktk DPzfig, ga`g fig, wPzfig, AZ`š' wPzfig Ges cinvox AĀj N G cvDv fvM fvm Kiv ntqtQ| DPzfigi gwU jvj etYp I K¼ihy; ga`g figi AvqZb 62,133 eM`K.wg. hv Ab`uj i Zžbvq AtbK tewk| wPzfigtZ elKvtj mvavi YZt 3N4 dlt cwb Rgv nq; t`tki newfbæ`vrb Aew`Z wej, nvi I b`xvjvi ZxieZx® GjvKimgw wbtq AZ`š'wPzRigi AĀj MvVZ Ges AtbK,tjv tQvU-eo cinvo, wUjv I Gt`i cv`fig wbtq cinvox AĀj MvVZ|



cvfVvEi gj-vqb 1.1

mWVK DEti i cvfkqUK wPy (✓) w`b

1/ Kwl.ej tZ Kx eSvq ?

K) Kwl.A_ Rwg Pvl Kiv/

L) Kwl.A_ Rwg Pvl Kti dmj Drcv`b/

M) Kwl.A_ gvw-gjwM cvj b/

N) Kwl.A_ km", dj-dj, kvK-kwâ, MwQcij v, grm" Ges ci'-cwl Drcv`b/

2/ fZtj i mgZvi Dci wfwE Kti evsj vt`kK KqW FvM FvM Kiv ntqtQ ?

K) `BwU

L) wZbwU

M) Pvi wU

N) cvBwU/

3/ cwrwvqv AAjtj fij nq tKvbwU ?

K) avb

M) Avbvi m

L) cvU

N) ZvqvK/

Zvcgvîv

Zvaci Aw` Dm ntjv mh[®] mh[®]t_îK weikiîyi gva`tg Zvc evqgÛj tf` Kti Avmvi cî_ bvbvfi`te evavcÛB nI qvq G Zvc euj vs`tk Ktg hvq| mh[®]nôZ weikwi Z th Zvc (Radiant energy) cî_ extZ Avtm ZvîK tmîi Zvc (Insolation) etj hv weifbêvte evqgÛj îK DÊB Kti| tmîi Zvc cî_ exi `j I Rj fivM cî_ ZZ nI qvq f_ cÛ DÊB nq| cti f_ ZK G Zvc weikib Kivq evqgÛj cbiq DÊB nq| evsjv`tki Zvcgvîv tgvUvgyD Dò| t`tki Avakvsk AÂj mgZj fvg (87%) nI qvq Ges `wîb mgÿ, DÊti wngvj q ceZ `vKivq Gt`tk ZZ kvZ ev Mig AbfZ nq br| Zte Lwi c tgsmÿg i we tgsmÿg Atc`v Zvcgvîv teik| Lwi c tgsmÿg Zvcgvîv mvavi YZt 24° tmj wmqum nôZ 35° tmj wmqum Gi gta` `vîK| Zte tKvb tKvb mgq G Zvcgvîv 43° tmj wmqum chSî DîV `vîK| Zvcgvîv t`tki `wîb vÂj nôZ DÊivÂj µgk ewx tctZ `vîK| kvZKvîj Zvcgvîv 7° tmj wmqum t`tk 27° tmj wmqum chSî t`Lv hvq| `wîb mgÿ DcKj t`tk G Zvcgvîv DÊi w`tk µgk nwm tctZ `vîK| G mgq t`tki DÊivÂj i tKvb tKvb tRjvq Zvcgvîv 4° tmj wmqum chSî tbtg Avtm| t`tki DÊivÂj Lwi c tgsmÿg Zvcgvîv teik nq Avevi i we tgsmÿg GLvîb Zvcgvîv Ab`vb` AÂj i Z`bvq Kg `vîK| G AÂj Kg Zvcgvîv teik w`b `vîK etj wKQyKQydmj thgb: Mg GLvîb fiv Rîbî| Zvcgvîvi wfvîZ evsjv`tki w`vîj wLZ wZbvU AÂj fivM Kiv hvq:

DÊi AÂj

Lwi c tgsmÿg meîPtq teik Zvcgvîv cwi j wîZ nq epÊi i vRkvx, iscj I w`b vRcîj tRjvq| 1992 mîb i vRkvxZ mteP 43° tmj wmqum Zvcgvîv ti KW`Kiv nîqt0|

ga`g AÂj

epÊi gqgbwmsn I XvKv tRjv mgfî ga`g Zvcgvîv weivRgvb `vîK| Lwi c tgsmÿg GLvîb mteP 38-39° tmj wmqum Zvcgvîv nîq `vîK|

`wîv-ce`v

epÊi ewi kvj, Kvgj I tbiqvLvix tRjv mgfî Lwi c tgsmÿg Atc`vîKZ. Kg Zvcgvîv cwi j wîZ nq| Gmgq Gme AÂj 34- 35° tmj wmqum Zvcgvîv weivRgvb `vîK|

ewîcvZ

ewi gÛj t`tk ev`úxfeb cî_µqvq D`weZ cPîz cwi gvîb Rjxq ev`ú evqjZ tftm teovq| evqj Rjxq ev`ú avi Y vîgZv Zvcgvîvi mî_ I ZtçîZ fîte RvîZ| tKvb Kiviîy evqgÛj i Zvcgvîv 10° tmj wmqum Gi wîbP tbtg Gtj AwZvi³ Rjxq ev`ú NbrFeb cî_µqvq f_ cî_ tbtg Avtm hv ewîcvZ bîtg cwi wPZ| Lwi c tgsmÿg evsjv`tk `wîb-cwîg w`K t`tk tgsmÿg evqyeîzcvvMîi i Dci w`îq cêvîvZ nq dtj GB tgsmÿg cPîz ewîcvZ nq| i we tgsmÿg evqy DÊi-ce`vîK Aew`Z ceZ AÂj nôZ cêvîvZ nq etj ewîcvZ nq br ej tîB Pîj | evsjv`tki tgvU ewîcvZi cvîv fivMîi Pvi fivMB nq el`Kvîj | meîPtq teik ewîcvZ nq Rîy-Rîyb gvîm| Zte GB ewîcvZi cwi gvîv t`tki ce`K nôZ cwîg w`tk µgk nwm tctZ `vîK| 1992 mîbi cwi msL`vb Abîvqx PÆMîg I wîj tU h`vµtg 2241 Ges 3504 wîj wUvi ewîcvZ NîU hv Ab`vb` tRjv Z`bvq Atc`vîKZ. teik| meîPtq Kg ewîcvZ nq i vRkvx tRjv hv gvî 849 wîj wUvi | wîj tU tRjv i j vj Lvîj ermîi t`tki meîc`vîv teik ewîcvZ nq (6496 wîj.) Ges meîPtq Kg ewîcvZ nq i vRkvx tRjv i j vj cîj (1199 wîj.)| t`tki evrmi K Mo ewîcvZ 222 wîj wKs` bîf`î nôZ gvP`gvîm chSî ewîcvZ nq gvî 30 wîj wUvi | t`tk ewîcvZ cî_qvRîbi AvZvi³ nI qv mîÊîl mgqgZ I cwi gvîv gZ br

wîj tU tRjv i j vj Lvîj ermîi t`tki meîc`vîv teik ewîcvZ nq (6496 wîj.) Ges meîPtq Kg ewîcvZ nq i vRkvx tRjv i j vj cîj (1199 wîj.)|

nI qvq cḶZ`K ermtiB RvgtZ cḶqvRbix iṭmi Afvte dmtji gvivZK ḲvZ nq Ges iue tgsmṭg ṭmP Qvov mvdj`RbKfvte ṭKvb dmj Kiv m̄e nqbr| evḣvctvZi Dci vfv̄E Kṭi evsj vt`kṭK v̄b̄nj v̄LZ v̄Zb̄fv̄ṭM fv̄M Kiv hvq -

- Kg evḣvcvZ AĀj - ep̄Ei ivRkivx I v̄b̄v̄Rcj AĀj |
- gvSvix evḣvcvZ AĀj - ep̄Ei xvKv I Ljybv AĀj |
- tenk evḣvcvZ AĀj - ep̄Ei v̄mtj U I PĚMḡg AĀj |

AvṭcvṭK Av`zv

evqṭZ Rjxq evṭ^ui Dcv̄v̄ZṭK Av`zv etj | ṭKvb ṭvṭbi Av`zv ṭmB ṭvṭbi evḣvcvZ I Zvcgvṭvi Dci v̄b̄fv̄ṭKxj | ṭKvb v̄b̄v̄ḥ DòZvq I Pṭc ṭKvb v̄b̄v̄ḥ AvqZṭbi evqṭZ th cv̄i gvY Rjxq evṭ^u AvṭQ Ges GKB DòZvq I Pṭc H cv̄i gvY evqṭK m̄^uḡ³ KṭiZ th cv̄i gvY Rjxq evṭ^ui cḶqvRb nq -G`ḡqi Abḡv̄ZṭK AvṭcvṭK Av`zv etj | AvṭcvṭK Av`zv kZKiv (%) nṭi cḶk Kiv nq| evsj vt`k elḴvtj Av`zv kvZKvj AṭcḲv tenk| KvY G mgq Zvcgvṭv, evḣvcvZ Ges b`x-buj v̄ cv̄b̄ṭZ fv̄vU v̄Vqv evqṣṬṭi Av`zv evḰ cvq| Dò I Av`Avenv̄lqv̄i Rb` G ṭk cvU Drcvṭbi Rb` tenk Dcṭh̄v̄M| evsj vt`ki evqṣṬṭi m̄vavi YZt kZKiv 70-80 fv̄M AvṭcvṭK Av`zv ṭv̄Lṭ hvq| GB Av`zv v̄v̄bi cḶṭṭtenk v̄ṭK|

ṭKvb v̄b̄v̄ḥ DòZvq I Pṭc ṭKvb v̄b̄v̄ḥ AvqZṭbi evqṭZ th cv̄i gvY Rjxq evṭ^u AvṭQ Ges GKB DòZvq I Pṭc H cv̄i gvY evqṭK m̄^uḡ³ KṭiZ th cv̄i gvY Rjxq evṭ^ui cḶqvRb nq -G`ḡqi Abḡv̄ZṭK AvṭcvṭK Av`zv etj |

mḥḡ Avṭj v

mḥḡ Avṭj v bv v̄Kṭj cv̄v ex Ggb meḴ m̄ȳi v̄vKZ bv| mḥḡ Avṭj vK kv³ṭk e`envi Kṭi meḴ Dv̄ḡ^u Lv`Zix Kṭi hvi Dci cḶḡḡ I cṭivṭfv̄te gv̄v̄m̄n mKj cḶḲ v̄b̄fv̄ṭKxj | me MṭṭQi Rb` mḥḡ cḶḡḡ Avṭj v evĀbix bq| Pv, cv̄b BZ`v̄ MṭṭQi Rb` Cṭr Ov̄v̄i e`e`v v̄Kv fij | mi v̄m̄vi mḥḡ Avṭj v Gme MṭṭQi cv̄Zv S̄j v̄mt̄q ṭ`q| GRb` Pv ev cv̄ṭbi RvgtZ h v̄v̄ṭg v̄kg`RvZix MvQ I cv̄Uṭk̄vj v̄Ksev LoKḲṭṭ v̄ṭq Ov̄v̄i e`e`v Kiv nq| Avevi ṭKvb ṭKvb dmj thgb: nj ~ Ov̄v̄ḣṭ ṭvṭb fij RṭbḲ|

v̄v̄bi ḡN^u

v̄v̄bi ḡṭN^u Dci Avṭj v I Zvcgvṭvi cv̄i gvY v̄b̄fv̄ṭK Kṭi | kvZKṭj ḲvZzG v̄b 10 Nv̄Uv Ges elḴṭj ep̄Eg v̄b cḶḡ 14 Nv̄Uv nṭq v̄ṭK| v̄b eo nṭj Avṭj vi cv̄i gvY tenk nq hv̄ AvKvṭk tgN bv v̄ṭK Ges Kg nṭj Avṭj vi cv̄i gvY Kṭg hvq| eo v̄b ev Avṭj v AṭbK Dv̄ḡ^u i dḣ I exR Drcvṭb ṭḲṭṭ v̄v̄ṭṭ cḶve me`vi Kṭi v̄ṭK| Dv̄ḡ^u Rv̄ṭbi Dci G v̄v̄ṭṭ cḶv̄qv Z_v thṭb esk evḰi Dci Avṭj vi Gṭc cḶve me`liṭK dṭUv̄cv̄i qWWRg (Photoperiodism) etj | MṭṭQi RbḲ Ges evḰi Dci v̄v̄bi ḡṭN^u mi v̄m̄vi cḶve iṭqṭQ| v̄KQȳv̄KQȳMv̄Qcv̄j v̄ Avṭj vK mṯe`bkxj (Photo sensitive) Avevi ṭKvb ṭKvb Mv̄Qcv̄j v̄ Avṭj vK mṯe`bkxj bq (Photo insensitive)| Avṭj vK mṯe`bkxj Mv̄Q dṭUv̄ v̄cv̄i qW KZḴ. cḶv̄v̄m̄ṶZ nq| v̄KṶ`th mKj Mv̄Q Avṭj vK mṯe`bkxj bq Zv̄i v̄ dṭUv̄ v̄cv̄i qW KZḴ. cḶv̄v̄m̄ṶZ nq bv| dṭUv̄ v̄cv̄i qṭWi Dci v̄v̄ḥ Kṭi Avṭj vK mṯe`bkxj Mv̄QṭK`ḡṭv̄ṭM fv̄M Kiv hvq, h_v - 1| ṭQvU v̄b Dv̄ḡ^u (Short-day plant) Ges 2| eo v̄b Dv̄ḡ^u (Long-day plant)|

ṭQvU v̄b Dv̄ḡ^u

th mg`I Dv̄ḡ^u GḲvU v̄b̄v̄ḥ v̄b ḡN^u ev Zvi AvṭM kv̄l, dḣ, dj ev exR Drcv̄Ḳṭi Zv̄ṭ iṭK ṭQvU v̄b Dv̄ḡ^u etj | GB v̄b ḡN^u ev̄v̄b̄v̄ḥ dmj ev MṭṭQi Rb` v̄v̄b̄v̄ḥ v̄v̄ṭṭZ cv̄ṭi Ges GṭK v̄v̄ṭṭṭ`ij v̄b ḡN^u (Critical day length) etj | ṭQvU v̄b Dv̄ḡ^u v̄v̄ṭṭṭ`ij v̄b ḡN^u ev dṭUv̄ v̄cv̄i qṭWi cṭi dḣ dj ṭ`q bv| thgb - cv̄U, mqv̄xb, BZ`v̄ |

th mg`I Dv̄ḡ^u GḲvU v̄b̄v̄ḥ v̄b ḡN^u ev Zvi AvṭM kv̄l, dḣ, dj ev exR Drcv̄Ḳṭi Zv̄ṭ iṭK ṭQvU v̄b Dv̄ḡ^u etj |

th mg ǘ Dwǘ tKej gvǘ
 tKvb ǘ wǘ ǘ ǘ b ǘ ǘ Nǘ
 cǘiB dǘ, dj t ǘ q
 Zǘ t ǘ i ǘ K eo ǘ b Dwǘ
 eǘj |

ǘ b ǘ b i ǘ t c ǘ ǘ Dwǘ t ǘ i dǘ,
 dj Drcv ǘ t b dtǘ v
 ǘ c ǘ i q ǘ t Wi t Kvb c ǘ f ǘ e
 t b B |

eo ǘ b Dwǘ

th mg ǘ Dwǘ tKej gvǘ tKvb ǘ wǘ ǘ ǘ b ǘ ǘ Nǘ cǘiB dǘ, dj t ǘ q Zǘ t ǘ i ǘ K eo ǘ b Dwǘ eǘj | ǘ wǘ ǘ dtǘ v ǘ c ǘ i q ǘ t Wi (Photo period) c ǘ t ǘ GmKj Dwǘ t Kvb μǘ tǘ B dǘ, dj t ǘ q b v |

ǘ b ǘ b i ǘ t c ǘ ǘ Dwǘ

tKvb tKvb Dwǘ ǘ b ǘ b i ǘ t c ǘ ǘ ǘ ǘ b ǘ b i ǘ t c ǘ ǘ Dwǘ t ǘ i dǘ, dj Drcv ǘ t b dtǘ v ǘ c ǘ i q ǘ t Wi t Kvb c ǘ f ǘ e t b B |

eo ǘ b Dwǘ t ǘ i dǘ, dj Mǘ t ǘ Kǘ t j Ges t QvU ǘ b Dwǘ t ǘ i dǘ dj kǘ Z I emšKǘ t j Avǘ t m | evs j v t ǘ t k i ǘ w e f b a g v t m i ǘ t b i ǘ ǘ N ǘ b t ǘ t ǘ q v n t j v |

gǘ t m i b v g	ǘ t b i ǘ ǘ N ǘ	
	N ǘ U v	ǘ g ǘ U
R v b g n i	10	40
t d e q w i	11	04
g v P	11	37
G ǘ c j	12	24
t g	13	04
R b j	13	31
R j v B	13	36
A v M o	13	18
t m t p t	12	40
A t ± v e i	11	58
b t f t	11	15
ǘ v t m t	10	48

evqyǘn

evqygǘ t j i Z v c g v t v i c v f K i d t j m o evqygǘ j x q P v t c i c v f K i K v i t y c i q c i z g y t z evqyGK ǘ v b n o t Z Ab ǘ t b ǘ v b s h i Z n t ǘ | evqy GB ǘ v b s h i t K evqycǘn e t j | evs j v t ǘ t k c ǘ v b Z t ǘ g a i t b i evqycǘn t ǘ L v h v q | h v t 1 | m i g u q K (Seasonal) Ges 2 | A n b q u g Z (Irregular) evqycǘn | m i g u q K evqycǘn i g t a G t ǘ k ǘ j evqy m g y ǘ evqyGes t g s m y g evqy D t j L t h v M | Ab ǘ t K A n b q u g Z evqycǘn i g t a m i b t K v b ev N y S o , K v j ǘ k v L x Ges U t b f M v i b i g K i v t h t Z c v t i | k x Z K v t j t g s m y g evqy D E i c e ǘ K n o t Z c ǘ n n Z n q Ges G evqy M u z t e M K g Ges t K v b i f c R j x q ev ǘ ǘ v t K b v d t j G evqycǘn i d t j t K v b ev ǘ c v Z I n q b v | g v P G ǘ c j g v t m G t ǘ k K v j ǘ k v L x A v N v Z n r t b Ges R v b g v t j i t e k ǘ q ǘ t v Z N U v q | R b j - t m t p t g v t m ǘ ǘ Y - c i d g ǘ K n o t Z t g s m y g evqycǘn n Z n q | G evqy m g y ǘ n o t Z c ǘ z R j x q ev ǘ ǘ e t q A v t b Ges G m g q t ǘ t k c ǘ z ev ǘ n q | A t ± v e i - b t f t g v t m m g y ǘ D c K j e Z ǘ A A t j m a v i b Z t m i b t K v b I R t j v ǘ v m n t q v t K | e t ǘ v c m v M t i i Z ǘ t i t k l i v t Z I t f v t i i ǘ t K ǘ j f v M n o t Z ǘ j evqy m g y ǘ t ǘ K Ges A c i v t y m g y ǘ t ǘ K m g y ǘ evqy ǘ j f v t M i ǘ t K c ǘ n n Z n q |



Abǘ j b (Activity): A v c b v i ǘ b K U ǘ A v e n i l q v A ǘ d m n o t Z Z ǘ m s M h K t i M Z 1 e Q t i i (c i z g ǘ t m i c ǘ K c ǘ K M o) ǘ e m ǘ N ǘ A v t c i ǘ ǘ K A v ǘ v ev ǘ c v Z Ges Z v c g v t v i v e e i Y Q K A v K i t i ǘ Z i i K i a b |

Kul .tgšmg

evsj v eQti 2 gvfm GK FZznq| G,tjv nt`Q M®š, el®, kir, tngš, kxZ I emš| MKŠ` tKib dmj B`B gvfm Zvi Rxeb Pµ m`úbeKi tZ cvtibv| ZvB Kul.KvRi m`eavt_`mg`I eQi tK c`vbZt` M Kul.tgšmg fVM Kiv ntqtQ -

- iwe tgšmg (Rabi season)
- Lwi c tgšmg (Kharif season)|

iwe tgšmg

btf`af gvfm iwe tgšmg i i nq Ges tkl nq tdeyix gvfm|

btf`af gvfm iwe tgšmg i i ynq Ges tkl nq tdeyix gvfm| th mKj dmtji RxebKvj m`úY`ev AwaKisk mgq G tgšmg AwZemnz Kti tm,tj v tK iwekm` etj | thgb- ZivgK, tMvj Avj yMg, gmj, tLmvi x, tQij v BZ`w` |

Lwi c tgšmg

Lwi c tgšmg i i nq gvP` gvfm Ges tkl nq At±vei gvfm|

Lwi c tgšmg i i ynq gvP`gvfm Ges tkl nq At±vei gvfm| th mKj dmtji Rxeb Pµi m`úY`ev AwaKisk mgq GB tgšmg AwZemnz nq tm,tj v tK Lwi c km` etj | thgb- AvDK aib, cvU Ges wefbaM®šKvj xb kvK-miã |

Lwi c tgšmg tK Avei`B fVM fVM Kiv ntqtQ| h_vt-

Lwi c-1

GtK c`K Lwi c tgšmg| ej v nq| Lwi c-1 gvP`gvfm i i ynq Rly gvfm tkl nq|

Lwi c-2

Lwi c-2 RjvB gvfm i i ynq Ges At±vei gvfm tkl nq|

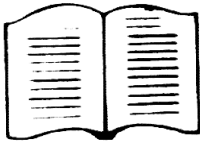
iwe tgšmg ZivcgvIv, e`pocvZ Ges Av`Zv Kg _v tK| w`b tQvU nq Ges ivZ eo _v tK| Gmgq tgšmg evqyDÉi-ce`w`K nótZ c`emnz nq etj t`tk e`pocvZ Kg nq| iwe dmtji gta` D tj-LthvM` ntjv iwe miã thgb- Avj y d`zKuc, evavKuc, UtgtUv, j vD, Mg, mvi Iv, wZw, Pxbver`vg I Wj RivZiq dmj |

Lwi c tgšmg ZivcgvIv , e`pocvZ Ges evZvM Av`Zvi cwi gvY tenk _v tK| w`b eo I ivZ tQvU nq| `w`b-cu`og tgšmg evqyc`vni dtj Gmgq t`tk c`p`z e`pocvZ nq| Lwi c dmtji gta` i tqtQ Xiuom, c`BkvK, AvDK aib, BZ`w` | GLvB D tj L Kiv thtZ cti th, tKej GKelx`dmj mg ntKB iwe Ges Lwi c dmj Ablyqx fVM Kiv m`e|

Lwi c -1 , Lwi c-2 Ges iwe FZž Zj`bvj-K cv_`R` ubtæt` I qv ntj vt

Zj`bvi vfiÉ	Lwi c-1	Lwi c-2	iwe
tgqv`	gvP`P` c`lg t` tK Rjbi tkl chš	RjvB Gi c`lg t` tK At±veti i tkl chš	btf`af i c`lg t` tK tdeyixi tkl chš
e`pocvZ	e`pocvZ gvSvi x Ges tgšmgi tktli w` tK i i ynq	mvi v tgšmgB e`pocvZ nq	Lg Kg, c`lg w` tK mvgvb` nq
wkj vepó	wkj v e`pó tenk nq	LgB Kg nq	LgB Kg nq

NySo I UtbfWw	NybSo I UtbfWw nl qri mtebr tewk	Kg	Kg
ZvcgvIv	ZvcgvIv Lg tewk	tewk	Kg
tgN	tkti w tk AvKvtk tgN_vtK	mvi v tgsmgB tgN _vtK	cŭg w tk tgN_vtK
w tbi ˘N ^e	w b mgvb t tk eo nq	eo t tk mgvb nq	mgvb t tk tŭvU nq
er ^u rFeb	er ^u rFeb tewk nq	Kg nq	grSvix
Av`Zv	evqjZ Av`Zv grSvix	tekx	Kg
ti vM-evj vB	dmj ti vM evj vB grSvix	tekx nq	Kg nq
cavb dmj	cavb dmj - AvDk avb, cvU, wZj, KvDb BZ`w	Avgb avb	Mg, tMj Avj yWj RvZxq Lv`



mvi gg^o
 evsj vt`tki DEti fvi tzi cŭge½ I Avmvg, cte^ofvi tzi wlcjv ivR" I gqvbgvi, cŭŭg
 fvi tzi cŭge½ Ges `wŭtY et½vcmwMi |
 tKvb wbw` 8 mgtq tKvb `vtbi evqgUjxq Ae`vtK tm `vtbi H mgtqi Avenl qv etj |
 Acictŭ tKvb `vtbi AŠZt 25 ermŭi Avenl qvi MoŭK H `vtbi Rj evqyeŭj | dmj
 Drcv`tb ZvcgvIv, evŭcvZ, Av`Zv, mŭh^o Avtjv, w tbi ˘N^o Ges evqgŭm cŭvzi mŭuó
 cŭve we`gvb |
 Kwl. tgsmg cavbZ `ŭU -1| iwe tgsmg - btf^oŭi cŭg nŭtZ tdeŭvixi tkl chŠ | 2 |
 Lwi c tgsmg - gv^ogvŭmi i iynŭtZ Aŭvei gvŭmi tkl chŠ | Lwi c tgsmg tK Lwi c-1 Ges
 Lwi c-2 G `B fvtM fvm Kiv hŭq |



ciVvEi gj`iqb 1.2

mWk DEti i ciVvEi UK iPy (✓) w`b,

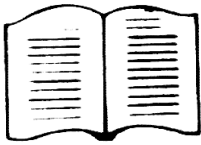
- 1/ ersj vt`tki AvqZb KZ ?
 - K. 1,45,999 eMqK. ug.
 - L. 1,47,570 eMqK. ug.
 - M. 1,73,548 eMqK. ug.
 - N. 1,63,432 eMqK. ug.
- 2/ Rj erqyKZ ermti i Avenl qvi MoK eSvq ?
 - K. 10 ermi L. 5 ermi
 - M. 20 ermi N) 25 ermi |
- 3/ tKvb Rj erqyAZ`maK WUvl bq AZ`maK kxZI bq ?
 - K. g`yfvrcbaRj erqy
 - L. Pi g fivrcbaRj erqy
 - M. bWZkxZvò Rj erqy
 - N. mgfivrcbaRj erqy
- 4/ tKvb tRj iq ewocvZ Kg nq ?
 - K. XvKv L. i vRkvnx
 - M. ewi kvj N. imtj U|
- 5/ i we tgSmg tKvb gym t`tK tKvb gym chS| ?
 - K. Rvbgvi x nòtZ Rly gym chS|
 - L. tdeyvi x nòtZ RjvB gym chS|
 - M. btf`t nòtZ tdeyvi x chS|
 - N. gvP`nòtZ A±vei chS|

cw-1.3 Mqcyj v I RxeRš' Dci Rjevqj cŕve



G cvV tkŕl Avciwb

- ◆ Rjevqj Dwŕc' eipŕŕi wfiŕŕZ wef³ evsj vŕ' ŕki wewfbæAĀj kbv³ KiŕZ cviŕeb|
- ◆ tKvb AĀŕj Kx aiŕbi Mqcyj v RŕbŕZvi eYŕv w' ŕZ cviŕeb|
- ◆ tKvb AĀŕj Kx aiŕbi RxeRš' evm Kŕi Zvi weeiY w' ŕZ cviŕeb|



Rjevqj Dci wbfŕ Kŕi ŕ' ŕki wewfbæŕŕb wewfbæaiŕYi Dwŕc' Rŕbŕ Ges wewfbæRxeRš' evm Kŕi| tKvb Rxe GKKŕŕe cKŕZŕZ _vKŕZ cviŕbv| mŕaviYZ wewfbæŕMŕŕi Rxiemgŕ mgwŕMZŕŕe GKŕŕb evm Kŕi| tewki fŕM Rxe mŕŕvq Dwŕc' I cŕYxi mgwŕ Őviv MŕVZ| GŕKK AĀŕj GŕKK aiŕYi Mqcyj v I RxeRš' cwij wŕŕZ nq hv H AĀŕj i cwŕŕekZš; ev BŕKŕmŕŕŕgi Dci wbfŕKŕj |

evsj vŕ' ŕki Rjevqj eipŕ I Dwŕc' aiŕYi Dci wbfŕ Kŕi GŕK wŕŕvq wLZŕŕe fŕM Kiv thŕZ cviŕi |

- 1| Mŕv b`xi weŕŕYŕmgŕŕg AĀj (The Ganges Plane)
- 2| wŕinŕir cŕSiv AiYŕĀj (Evergreen and Semi-evergreen Forests)
- 3| cŕSiv AiYŕĀj (Deciduous Forests)
- 4| gŕvbŕŕŕf AiYŕĀj (Mangrove Forests)

Mŕv b`xi weŕŕYŕmgŕŕg AĀj

tŕki c evĀŕj i wKŕy Abyŕ cinŕo I wŕj v eŕwZZ cŕq mgMŕevsj vŕ' kb GKŕw weŕŕYŕmgŕŕg| wewfbæb`-b`x I Gŕŕ i kvLv cŕkLv Rŕŕj i gZ mgMŕŕŕk Őwŕŕq Avŕŕ| tŕki mgŕŕg AĀj

tŕki c evĀŕj i wKŕy Abyŕ cinŕo I wŕj v eŕwZZ cŕq mgMŕevsj vŕ' kb GKŕw weŕŕYŕmgŕŕg| wewfbæb`-b`x I Gŕŕ i kvLv cŕkLv Rŕŕj i gZ mgMŕŕŕk Őwŕŕq Avŕŕ| tŕki mgŕŕg AĀj

Gme b`x I kvLv b`x weŕŕŕZ cij Őviv MŕVZ| G AĀŕj i Dwŕc' mg nŕK wZbfŕŕM Kiv hvq| thgb- RjR Dwŕc', Abiev`x Rŕgi Mqcyj v Ges Avev`x Rŕgi dmj| elŕKŕŕj hLb cŕŕŕ evŕcŕZ nq ZLb wej, nŕli I cŕŕŕi wewfbæRjR Dwŕc' Rŕbŕ| Giv nŕjv cvZŕŕKŕj v, cvZŕSŕŕ, Kŕŕi cvbv, kvcjv, c`ŕŕ ŕŕŕŕ cvbv, tŕvcv cvbv, wŕocbv, wŕŕvŕv, BZ`w`| nŕli, wej I cŕŕŕi wKbvŕvq mŕZŕŕŕZ gwŕŕŕZ bj LvMŕv, Kj gx, tŕŕj Āv, cŕwb gwŕP, evZ tkŕjv, BZ`w` Dwŕc' ŕ`Lv hvq| Gŕŕ i RbŕI esk ewx G ŕgŕŕŕgB tewk|

wewfbæcŕwŕzi gvŕ, eŕvŕ, mŕc Gme Rjvŕŕq evm Kŕi| ewŕi cŕwbŕZ hLb Pŕwi w`K fŕi hvq ZLb Gme cŕYxi vŕ wewfbæRŕvŕMŕv Őwŕŕq cŕi| GmgqB Gŕŕ i cŕŕbb mgq| elŕKŕŕj hLb bŕPzRŕg cŕwbŕZ fŕi hvq ZLb wewfbæcŕYx evoxi Avŕk cŕŕk DŕZRŕvŕMŕv Pŕj Avŕŕm| kvZKŕŕj Gme nŕli ŕi wewfbæŕ`k nŕŕZ AwZŕw_ cŕwLiv Gŕm fŕx Kŕi Ges elŕPŕvŕvi mŕŕ_ mŕŕ_ Giv Pŕj hvq|

Avev`thŕM` Rŕg Ővov evoxi Avŕk cŕŕk, ŕij jvBb I ivŕŕi cvŕkŕ, b`xi avi I Abŕv` mŕavi Y RŕvŕMŕv wewfbæJŕax, ŕjŕI Abŕv` Dwŕc' ŕ`Lv hvq| Gŕŕ i RbŕI ewx Avevŕl qv Őviv wŕbqŕŕŕ| Gme ŕŕb th mKj Dwŕc' RŕbŕG_ŕj v nŕjv - ŕkZŕŕb, ŕŕvŕb, kvKbŕU, KvŕbŕU, nŕZŕi`o, aŕŕŕv, cŕwb gwŕP, wŕqŕj gwŕZ, KŕZŕvŕv BZ`w`| Gŕŕ i tKvbŕv Lwi c ŕgŕŕŕg Avevŕ tKvbŕv i we ŕgŕŕŕg Rŕbŕ| Gŕvov wKŕy wKŕy dmj Dfŕq ŕgŕŕŕgI Pŕl Kiv nq Ges bŕwiŕKj, Zŕj, mŕŕwi, tLRŕj, BZ`w` evoxi Avŕkcvŕk ev ivŕŕi avŕi ŕ`Lv hvq| Ővŕv cŕvŕKŕvix eŕŕ wŕŕŕŕe tZZŕ, eU, BZ`w` Mŕg evsjvi nŕv evRŕŕi bŕŕi cŕŕ| tŕki Dŕi-cŕwŕgŕĀŕj tŕŕŕZi Avŕŕj ev ivŕŕi avŕi cŕŕŕ evej v Mŕv tŕŕŕL cŕŕ|

DeP gml I Avenl qv dmj Drcv`tbi Rb` Abxj nI qvq mgZj fig AAjt miv eQiB
nefbaedmj Rtbj Rj evqyl Avenl qvi Dci wfiE Kti GLvrb nefbaetgsmjg nefbaedmj
Rtbj_vtK| tKvb tKvb dmj Lwi c tgsmtg fij Rtbj Avevi tKvblv i ayi ne tgsmtgB nq
Avevi wQywkQydmj Df q tgsmtgB Rtbj evk, Avg, Rvg, bwi tKj, AvZv, tj eyKj v, wj Pz
tej, Kvlj, tcqiv, Rv`jv, BZ`w` dtj i MvQ cOq cOZ`K emotZB t`Lv hvq|

eroxi Avtk crtki tSvc ev SvtO wkqj, tewR, Li tMvk, mvc, Bmvc, KvUeovj, ebueovj,
LvUvm Ges bvbv i Kg cvmL t`Lv hvq| kxZKvtj Giv `ieZx`vrb Qvotq wQvvtq_vtK| wKs`
el tKvtj Giv eroxi Avtk-cr tk DPz`vrb Ptj Avtm| wQywkQyciYx thgb- mvc, e`vO cFwZ
kxZKvtj MtZ`vtK| ZvcgvIv I epociv erovi mvt_ mvt_ Zviv MZ`tK tei ntq Avtm|

Pinir I cvZvSiv ebvAj

PEMog, cveZ` PEMog I wmtjU tRjvi cvnvox AAjt Aew`Z ebvAj G AAjt i AšMZ| G
AAjt cPz` epocivZ nq| Dw`t` i ai tbi Dci wfiEKti G GjuKvi Dw`c mg ntK Pvi fvM
fivM Kiv ntqtQ- Pinir, cvZvSiv, evk Svo I ZY. fig| Pinir Dw`t` i gta` MRB,
`ejvg, tgnwmb, wki I, Rvij, ARB, eU, AtkvK, BZ`w` i nefbaecRwZi eZgvb| G Qvov
nefbaAvtivrX Dw`t` i gta` i tqtQ div`gm, AwKw, BZ`w` |

cvZvSiv et`ji gta` i tqtQ tm_b, Pj Zv I Mgvni | nefbaecRwZi evkI GLvrb cPz` Rtbj|
dvKiv RvqMvq thLrb et`ji mSL`v Kg tmLrb cPz` Nvm Rtbj| cvnvtoi Xtj P, Avbvim I
Kjvi Pvl Kiv nq| cvnvtoi dtK dtK R2j cwi`vi Kti DcRvZxq tjvtKiv GLvrb Sg
c`wZtZ Rvq Pvl Kti | PEMog i `w`bvAjt ivertii Pvl nq|

nefbaecRwZi eb` RxeRš`G ebvAjt evm Kti | Gt` i gta` eb`nvZx, iKi, wPZvevN, Mqvj,
ebMiyebi, mRviyebi, nbgvb, nefbaecRwZi mvc wtkl Kti ARMi mvc c`vrb| dmj
cvKvi mgq nvZx, iKi, evbi, wUqvcvL cvnvox R2j t`tK tbtg Gtm dmtj i wvZ Kti
_vtK|

cvZvSiv ebvAj

G ebvAj t`tki ga`eZx`I DEivAjt Atc`wKZ.Kg epocivZ GjuKvq nefbaefvte Qovrb
Ae`vq AvtQ| fvlqvtj i Mo, gaxji i Mo, Mtov cvnvtoi cv`tk Aew`Z ebvAj,
tkicji i ivwvq ebvAj, etj`ebvAj Ges Kvgji kij wenvi G AAjt i AšMZ| Gme
ebvAjt i e`jiwRi gta` kZKiv 98 fivMB kij MvQ| Gme ebvAjt epocivZ Atc`wKZ.tenk|
nefbaecKvi RxeRš` I ci cvmLi mgstq Gme kij eb MvZ| kxZKvtj Gme ebvAjt MvtQi

cvZv Stj hvq Ges emš Kvj bZb cvZv MRvtZ`i iYKti |

eb` cOxi gta` evbi, Li tMvk, wkqj, ebueovj, LvUvm, tewR, KvUeovj x, iKi, ev`j,
Bmvc, AvvAbv, `vovk mvc, tMLiv mvc, BZ`w` t`Lv hvq| R2jt i gvSLvrb evBt` el tKvtj
KB, wks, gv`j, c`j, j vlv, wvbKvrb, tUsiv, evBg, ivOv, Zg BZ`w` gvQ cvl qv hvq|

gvbtMof ebvAj

mgj`i DcKj eZPj eYv³ gml tRvqi fivli Kvity me mgqB wFRv_vtK Ges GLvrb th
wtkl ai tbi ebvAj Mto DvtQ Ziv gvbtMof ebvAj bvtg cwiwPZ| evsj vt`tki `w`jY-
civog AAjt i 2000 eMgvBj GjuKv ivotq G AAj MvZ| Gi gta` 35 eMgvBj cUqvLij x
tRjvi `w`jb-civogvAj I evk Ask Ljybv tRjvi `w`jb AAj ivotq MvZ Ges cte`vrtj Kt,
civog i vq g2j b`x I `w`jtb et`vcmMi Oviv cwi temoz| GLvrbKvi Rj evqAv`Ges me`v

cvZvSiv ebvAjt i
e`jiwRi gta` kZKiv 98
fivMB kij MvQ|

mgj`i DcKj eZPj eYv³
gml tRvqi fivli Kvity
me mgqB wFRv_vtK Ges
GLvrb th wtkl ai tbi
ebvAj Mto DvtQ Ziv
gvbtMof ebvAj bvtg
cwiwPZ|



cvfVĒi gj`vqb -1.3

mivK DĒti i cvfkqUK vPý (✓) v`b

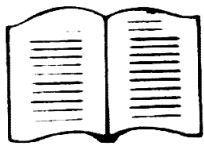
- 1/ Rj evqy`ewPĪ I Dw^m ai`bi Dci wfiĒ Kti ersj vt`k kK KqfvM fivM Kiv ntqfQ ?
K) Pvi fvM L) wZb fvM M) cvB fvM N) AvUfvM|
- 2/ tKvb mgq mvc i Kvgto gvby tek gviv hvq ?
K) M^ogKvtj L) kvZKvtj M) elKvtj N) tngšKvtj |
- 3/ ersj vt`k MvQ-cvj v j vMvbi DrKó.mgq tKvbw?
K) gvP^oGvcĵ gym L) Avt±vei -bt^of^ot gym
M) wM^ot^om^ot -Rivgvix gym N) R^og-RjvB gym|
- 4/ tKvb cŸx kvZKvtj M^oZ^o_vtK ?
K) evN L) mvc M) weovj N) Kkž |
- 5/ vPi nwi r I cvZv Siv ebiĀj tK KqfvM fivM Kiv ntqfQ ?
K) `B fvM L) wZb fvM M) Pvi fvM N) cvBfvM|
- 6/ cvZSiv ebiĀtj tKvb RivZiq e^o tek Rtb?
K) kvj L) Kv^olvj M) m^oy^oix N) tMI qv|
- 7/ g`vbtM^of ebiĀj tKv_vq Aew`Z ?
K) cvnvov Gj vKvq L) mgfv^og AĀtj M) eti>`^oAĀtj N) mgyZxi eZ^oAAĀtj |

cw 1.4 fvgi e`envi I dmj cwimsL`vb



G cvV tkfI Avciwb

- ◆ ejsj vt`tki f-fvM Kx Kx LtZ e`eüZ nt`Q Zv wPwYZ Ki tZ cvi teb |
- ◆ ebfvg, Avev` i AbjcvthvMx, Avev` thvM` Rvgi eYw w` tZ cvi teb |
- ◆ Pj wZ cwZZ I Avev` thvM` cwZZ Rvgi kbv³ Ki tZ cvi teb |
- ◆ cKZ.dmj x Rvg, GK dmj x, wØ-dmj x I Z-dmj x Rvg Kx Zv msAviqZ Ki tZ cvi teb Ges Zvt` i cwimsL`vb w` tZ cvi teb |
- ◆ km` PvfI i wbeozv Kx Zv e`L`v Ki tZ cvi teb |
- ◆ dmj cwimsL`vb m`fÜ Z` cÖvb Ki tZ cvi teb |



ejsj vt`tk tgvU Rvgi cwigvY cÖq 1,49,00,000 tn±i (we.we.Gm. 2000) | G t`tki f-fvM wewfbalvtZ e`eüZ nt`ZQ | G, t j v nt j v t

ejsj vt`tk tgvU Rvgi cwigvY cÖq 1,49,00,000 tn±i

- 1 | ebfvg (Forest land)
- 2 | Avev` i AbjcvthvMx Rvg (Area not available for cultivation)
- 3 | Avev` thvM` ev Pvl thvM` Rvg (Cultivable land)

Avev` thvM` Rvg tK` gfvM fvm Kiv hvq | h_v t

- K) Avev` thvM` ev Pvl thvM` cwZZ Rvg (Culturable waste land)
- L) Pvl KZ.dmj x Rvg (Cultivated land) |

Pvl KZ.dmj x Rvg tK Avev` gfvM fvm Kiv hvq | G, t j v nt j v t

- i) eZgvb ev Pj wZ cwZZ Rvg (Current fallow land)
- ii) cKZ.dmj x Rvg (Net cropped area)

cKZ.dmj x Rvg tK wZbfvM fvm Kiv hvq | h_v t

- a) GK dmj x Rvg (Single cropped area)
- b) wØ-dmj x Rvg (Double cropped area)
- c) wI-dmj x Rvg (Triple Cropped area)

1 | ebfvg

ejsj vt`tk cÖq 26,28,000 tn±i Rvg tZ eb i tq tQ hv tgvU fvgi cÖq kZKiv 18 fvM i gZ (we.we.Gm. 2000) | cÖkwZK fvimvg` i qvi Rb` tKvb t`tki 25% ebvAj _vKv DvPZ | ebfvgi w` K nÖtZ cävB cvBvU epEi tRjv nt`Q- creZ` PÆMvg, Ljybv, PÆMvg, wmtj U Ges Uv½vBj | th me tRjvq tgvfUB ebvAj tbB tm, t j v nt`Q epEi dmi`c j, hvtkvi, Kwöqv, e, ov I crebv | mvari bfvteB Gt`tk ebvAj i cwigvY Kg Zvi cti I thfvte AvbqvšZ Ges Acwi Kiv Z Dcv tq ebvAj aYsm Kiv nt`Q Zv hv` tiva bv Kiv nq Zte fuel tZ G t`k gi fvg tZ cw i YZ nÖtZ cvti hvi wKQyAvj v gZ GLbB t`tki DEivAj t`Lv w` tq tQ |

ejsj vt`tk cÖq 26,28,000 tn±i Rvg tZ eb i tq tQ hv tgvU t`j fvM i cÖq kZKiv 18 fvM i gZ | cÖkwZK fvimvg` i qvi Rb` tKvb t`tki 25% ebvAj _vKv DvPZ |

2 | Avev` i AbjcvthvMx Rvg

G Rvg tZ evoxNi, nvU-evRvi, kni-e` i, Avdm-Av`vj Z, -q-K t j R, gmtR`-g w` i, gv`tmv BZ`w` Aew`Z | Gi cwigvY cÖq 34,15,000 tn±i hv tgvU Rvgi kZKiv cÖq 23 fvM (we.we.Gm. 2000) |

3| Avev`thvM` Riq

Pvl`thvM` cWZZ Riq, Pj wZ cWZZ Riq I cKZ.dmj x Riqi cwi gvYi mgwó ntj v Avev`thvM` Riqi cwi gvY|

Avev`thvM` er Pvl`thvM` Riq ej tZ cKZct` KZUKzRiqZ dmj Avev` Kiv m`e Zv`K eSvq| Pvl`thvM` cWZZ Riq, Pj wZ cWZZ Riq I cKZ.dmj x Riqi cwi gvYi mgwó ntj v Avev`thvM` Riqi cwi gvY| Avi I mnRfvte ej v hvqN

$$\text{Avev`thvM` Riq} = \text{Avev`thvM` cWZZ Riq} + \text{Pvl KZ.dmj x Riq}$$
$$= \text{Avev`thvM` cWZZ Riq} + \text{Pj wZ cWZZ Riq} + \text{cKZ.dmj x Riq}$$

ersj v`k cwi msL`vb e`jiv, 2000 Abgvnti G t`tk Avev`thvM` Riqi cwi gvY c`q 88,03,239 tn±i | vbtæGi Ab`vb` tkYweFvM, tj v Avtj vPbv Kiv ntj v t

(K) Avev`thvM` er Pvl`thvM` cWZZ Riq

eiox-Ni, nuU-erRvi, Avdm-Av`vj Z, uk`qv cWZvib, gmuR`-gv`i BZ`w`i AvtkcvtK wKQy Riq cWZZ _vtK hv wKQyv hZvbtj B Pvlvvt` i Avl Zvq Avbv hvq| Gifc Riqtk Avev`thvM` cWZZ Riq etj Ges Gi cwi gvY c`q 3 j` qI tn±i hv tgvU Riqi kZKiv c`q 2 fV| Gifc cWZZ Riqi cwi gvY w` b w` b Ktg AvmtQ|

(L) Pvl KZ.dmj x Riq

Pvl KZ.dmj x Riq ej tZ eSvq th Riq Pvlvvt` Kti dmj Drcv`b Kiv nq| Pvl KZ.dmj x Riq = Avev`thvM` Riq N Avev`thvM` cWZZ Riq| Ab`K_vq, Pvl KZ.dmj x Riq = Pj wZ cWZZ Riq + cKZ.dmj x Riq| Gi cwi gvY c`q 85 j` qI tn±i, hv tgvU Riqi kZKiv c`q 57 fV|

(i) Pj wZ er eZ`vb cWZZ Riq

Ab`vb` eQi Avev` Kiv ntj I tkvb KvtY Avtj vP` eQti Kgc`q GK tgvntgi Rb`I Avev` Kiv bv ntj Zv`K Pj wZ er eZ`vb cWZZ Riq etj | Kvi Y, tj v nvtZ cvti Abvev, AvZev, Liv, extRi Afve BZ`w` | ersj v`tk c`q 3.49 j` qI tn±i Pj wZ cWZZ Riq AvtQ hv Kigtq i`b`Z AvbtZ nte| Gi cwi gvY tgvU Riqi kZKiv c`q 2.34 fV|

(i i) cKZ.dmj x Riq

GK, w` Ges w`-dmj x Riqi thvMdj B ntj v cKZ.dmj x Riq| Avgv` i t`tki c`q 81.38 j` qI tn±i Riq cKZ.dmj x Riqi Avl Zrf,³ | Gi cwi gvY tgvU Riqi kZKiv c`q 54.61 fV|

(a) GK.dmj x Riq

th RigtZ mviv eQi GKwU gvT dmj Rbvtbv nq Zv`K GK-dmj x Riq etj | Avgv` i t`tk GK.dmj x Riqi cwi gvY c`q 30 j` qI tn±i | Gifc Riqi cwi gvY mgkt Ktg AvmtQ| Gi cwi gvY cKZ.dmj x Riqi kZKiv c`q 37 fV|

(b) w` dmj x Riq

th RigtZ eQti w` dmj Rbvtbv nq Zv`K w`-dmj x Riq etj | Gt`tk w`-dmj x Riqi cwi gvY 41.48 j` qI tn±i i I tevk| G Riqi cwi gvY mgvstq evotQ| Gi cwi gvY cKZ.dmj x Riqi kZKiv c`q 51 fV|

(c) w`-dmj x Riq

th RigtZ eQti wZbvU dmj Rbvtbv nq Zv`K w`-dmj x Riq etj | Avgv` i t`tk eZ`v`b w`-dmj x Riqi cwi gvY c`q 10 j` qI tn±i | bZb bZb chv,³ RvtZi D`me, Kul.DcKiY Ges tmP mveav evx i dtj Gi cwi gvY w` b w` b teto Ptj tQ| GwU cKZ.dmj x Riqi kZKiv c`q 12 fV|

GK, w` Ges w`-dmj x Riqi thvMdj B ntj v cKZ.dmj x Riq| Avgv` i t`tki c`q 81.38 j` qI tn±i Riq cKZ.dmj x Riqi Avl Zrf,³ |

meşgûl dmj x Rûg (Total cropped area)

$$\text{meşgûl dmj x Rûg} = \text{GK dmj x Rûg} + (\text{û-dmj x Rûg } 2) + (\text{û-dmj x Rûg } 3)$$

Lwi c-1, Lwi c-2 Ges i we tgşmg ugij tq GK eQti meşgûl th cwi gvY RûgtZ Aev` Kiv nq ZvB meşgûl dmj x Rûg | meşgûl dmj x Rûg = GK dmj x Rûg + (û-dmj x Rûg x 2) + (û-dmj x Rûg x 3) | evsj v`tk tgvU dmj x Rûgi cwi gvY cûq 1,42,78,138 tn±i (we. we. Gm. 2000) |

km` Pıfı i ubeoZv (Cropping Intensity)

GKûU RûgtZ eQti hZûU dmj dj v`bv nq Gi kZKiv nvi tk km` Pıfı i ubeoZv etj | tKıv Rûgi km` Pıfı i ubeoZv 200% ev 300% ej tZ eŞıv H RûgtZ eQti h_ııtg `Ş ev uZbûU dmj Pıfı Kiv nq |

$$\text{km` Pıfı i ubeoZv} = \frac{\text{meşgûl dmj x Rûg}}{\text{cKZ. dmj x Rûg}} \times 100$$

1999-2000 m`b evsj v`tk km` Pıfı i ubeoZv uQj 175.45% (we. we. Gm. 2000) |

tKıv t`tki fıg weıfbrLıvZ e`eüZ n`Z cvıı | fıg e`enrtıi LvZıqvıx cwi gvYmZ u`b` RbvB mıvıvı Yfıte fıg e`enıvı cwi msL`vb ınrtmte cwi uPZ | u`b` (QK-1) evsj v`tki fıg e`enrtıi cwi msL`vb Ztj aiv nıj t

QK-1 t evsj v`tki fıg e`enrtıi cwi msL`vb (tn±i) t

mj	ebfıg	Aev` i Athıll` Rûg	Aev` thıll` Rûg	Aev` thıll` cıZZ Rûg	Pıfı KZ. dmj x Rûg	eZgıv cıZZ	cKZ. dmj x Rûg
1995-96	2151683	3961007	8702237	531749	8170488	392134	7778354
1996-97	2156119	3917707	8765733	524060	8249673	389706	7851967
1997-98	2254876	3750574	8833759	502208	8331551	363402	7968149
1998-99	2255870	3700809	8889069	445344	8443725	451417	7992308
1999-2000	2627530	3414979	8803239	316194	8487044	348988	8138057

mj	GK dmj x Rûg	û dmj x Rûg	uZb dmj x Rûg	meşgûl dmj x Rûg
1995-96	3186855	3521525	1094254	13512667
1996-97	2912077	3934299	1004820	13795135
1997-98	2865908	4084839	1016960	14086466
1998-99	2999190	4013765	979352	13964777
1999-2000	2993927	4148178	995951	14278138

(Drn: we. we. Gm-2000)

dmj cwi msL`vb

tKıv t`tki tgvU Kx cwi gvY RûgtZ Kx Kx dmj Aev` Kiv nh, tm, tıvı tgvU Drıv` b KZ Ges cûZ tn±tı tm, tıvı Drıv` tıvı cwi gvY Ges Zıv ınmve m`ûıx cûZte` btk dmj cwi msL`vb etj | t`tk tKıv eQi Kx cwi gvY avb, Mg, cıU, AvL, ZıgvK, Wıj I `Zj Rıvıx Ges Ab`vb` dmj Drıv`nıq Zıv GKgvı dmj cwi msL`vb nıfZ cvı qı m`e |

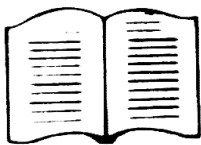
avtbi Rigi gta` Avgb
avb 5843.7 nVRvi tn±i
RigtZ Drcbæq hv tgvU
avbx Rigi kZKiv 57
fM|

vbta` QK (2) nôtZ t`Lv hvq th avbB mePpq tek cwi gvY RigtZ RtbY| avtbi Rigi gta`
Avgb avb 5843.7 nVRvi tn±i RigtZ Drcbæq hv tgvU avbx Rigi kZKiv 57 fM|
tevtiv avb Drcbæq 2580.3 nVRvi tn±i Ges AvDk avb 1649.4 nVRvi tn±i | tgvU avbx
Rigi kZKiv 25.5 I 16.4 fM h_vµtg tevtiv I AvDk avb Drcbæq| eZgvtb (1993-
094) mefgvU 10073.6 nVRvi tn±i RigtZ avb Drcbæq Ges tgvU Drcv`tbi cwi gvY
18302 nVRvi tgvUK Ub| MZ KtqK eQtii LwZqv nôtZ t`Lv hvq th Mg Prtli Rigi
cwi gvY tgvUvgnj w`wZkxj | eZgvtb 882.2 nVRvi tn±i RigtZ Mg Drcv`b Kiv nq Ges
Drcv`tbi cwi gvY 1908 nVRvi tgvUK Ub| AvšRwZK evRvti cttUi gj` Ktg hvI qvq cvU
Prtli Rigi cwi gvY w`b w`b Ktg AvmtQ| eZgvtb ersj vt`k 477.9 nVRvi tn±i RigtZ cvU
Pvl nt`Q Ges Drcv`tbi cwi gvY 812 nVRvi tgvUK Ub| eZgvtb 174 nVRvi tn±i RigtZ
6951 nVRvi tgvUK Ub AvL Drcbæq`Q| ZvgvK A_`Rix dmj | ZvgvK Drcv`tbi Riq Ges
Drcv`b tgvUvgnj w`wZkxj | Wj dmj I `Zj exR dmtj i Drcv`b I Rigi cwi gvY w`b w`b
Ktg AvmtQ Ges G`gU dmj B GLb gj`evb `et`kk gy` Lip Kti me`k nôtZ Avg`vbx
KtZ nq| eZgvtb 546.7 nVRvi tn±i RigtZ wewfbæWj dmj Ges 511.5 nVRvi tn±i
RigtZ wewfbæ`Zj exR dmtj i Pvl Kiv nh Ges Drcv`tbi cwi gvY h_vµtg 417 I 700
nVRvi tgvUK Ub|

QK - 2 t cãvb cãvb dmtj i Avev`KZ.Rigi cwi gvY I Drcv`b |

dmj	1998-99		1997-98	
	Avev`KZ Riq (00000 tn±i)	Drcv`b (00000 Ub)	Avev`KZ Riq (00000 tn±i)	Drcv`b (00000 Ub)
avb	10115.389	19905.0	10262.2	18862.0
AvDk	1424.500	1617.0	1565.8	1875.0
Avgb	5164.500	7736.0	5808.4	8850.0
tevtiv	3527.500	10552.0	2889.5	8137.0
Mg	882.200	1908.0	804.5	1803.0
cvU	477.900	812.0	577.4	1057.0
AvL	174.000	6951.0	175.2	7319.0
Pv	48.560	56.186	48.56	50.575
ZvgvK	31.565	29.0	32.779	37.0
Wj dmj	546.722	417.0	682.695	518.0
%Zj exR	511.515	700.0	560.886	483.0

(Drm: we.ue.Gm. 1999)



mvi gg®
ersj vt`k tgvU Rigi cwi gvY 1,49,00,000 tn±i | Gt`tki f_fvMtk cãvbZ wZbfrtM fM
Kiv hvq h_v-ebfng, Avev`i Abg`thwMx Riq Ges Avev`thwM` Riq| cãkwZK fvimvg` i qjvi
Rb` tKvb t`tki 25% ebr`Aj _vKv DvPZ wKŠ` ersj vt`k itqtQ gvI 18%| ersj vt`k
mefgvU dmj x Rigi cwi gvY 1,42,78,138 tn±i Ges km` Prtli i wbeoZv 175.45%|
t`tki tgvU Kx cwi gvY RigtZ Kx Kx dmj Avev` Kiv nq Ges Zvt`i tn±i cãZ dj b I tgvU
Drcv`b dmj cwi msL`vb nôtZ Rvrv hvq|



сұтVĒi gj̄-ıqb 1.4

mwVK DĒti i сұтk̄,UK ıPý (✓) ı̄ b

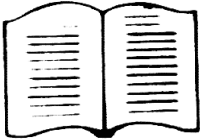
- 1/ еısj ı̄t̄ tk̄ tgvU Rıgi сıııgvY KZ ?
K) 1,45,35,996 tn±i L) 1,50,52,512 tn±i
M) 1,49,00,000 tn±i N) 1,62,42,512 tn±i |
- 2/ еısj ı̄t̄ tk̄i f- fıMtk̄ c̄ıvbZt KqfıM fıM Kiv n̄t̄q̄t̄Q ?
K) `k fıM L) ı̄Zb fıM
M) сıvı fıM N) mvZ fıM |
- 3/ GK, ı̄ I Z- dımj x Rıgi mgııó 0ıııv t̄Kıv Rıg MıvZ nq ?
K) сk̄Z. dımj x Rıg L) meıgvU dımj x Rıg
M) Aveı̄ t̄ıvM̄ Rıg N) Pıı KZ. Rıg |
- 4/ t̄Kıv t̄ tk̄ Zıı tgvU AvqZt̄ıı k̄ZKııv KZ fıM eb_ıvKıı eıĀbıq ?
K) 40 fıM L) 13 fıM
M) 20 fıM N) 25 fıM |
- 5/ ı̄ıııfıııııııı ḡt̄ı̄ t̄Kıv avb me t̄P̄t̄q̄ t̄ııı Rıḡt̄Z Drcıııııııı ?
K) AvDk avb L) Avgb avb
M) t̄ıııııııı avb N) t̄ıııııııı Avgb avb |
- 6/ eZıııııııı (1997-98) еısj ı̄t̄ tk̄ aııııııııı Drcıııııııı b KZ ?
K) 15.5 j ı̄ıı Ub L) 12.5 j ı̄ıı Ub
M) 18.8 j ı̄ıı Ub N) 20.5 j ı̄ıı Ub |
- 7/ еısj ı̄t̄ tk̄ tgvU Aveı̄ t̄ıvM̄ Rıgi сııııgvY KZ ?
K) 7,54,862 tn±i | L) 88,03,239 tn±i |
M) 4,195,140 tn±i | N) 5,734,200 tn±i |

cw-1.5 Kul.DcKiY e`enitii eZgub Ae`v



G civ tkfi Avcub

- ◆ Kul.DcKiY Kx Zv e`vL`v KitZ cvi`teb|
- ◆ exR I mvi weZi`Yi weeiY w`tZ cvi`teb|
- ◆ hmsK I MZvbymZK cxwZtZ tmP cUv`bi cwi mSL`vb w`tZ cvi`teb|
- ◆ Avc`bvkK e`enitii eZgub Ae`vi weeiY w`tZ cvi`teb|



DcKiY ntjv cUqvRbxq wRnbmcl hv tkvb e`v`Zwi ev DrcbeKitZ `ikvi nq| Kul. DcKiY ejtZ eSvq dmj Drcv`b KitZ miwmi Kx Kx wRnbmcl`i cUqvRb| Kul. DcKiYtK `fivM fivM Kiv thtZ cvfi | h_vt

K) Ae`MZ DcKiY Ges

L) e`MZ DcKiY|

Ae`MZ DcKiY nOtv
kigK, Z_v guby, Miy
giml Ges hmsK kw³|
Avi e`MZ DcKiY nOtv
gj-Z exR, mvi, cwb, Ges
Avc`bvkK|

Ae`MZ DcKiY ntjv kigK, Z_v guby, Miygiml Ges hmsK kw³ | Avi e`MZ DcKiY ntjv gj-Z exR, mvi, cwb, Ges Avc`bvkK| Avgiv GLv`b e`MZ DcKiY m`fU Avtj vPbv Kitv|

exR

evsj v`tki Avakisk KIK Kul`t`f`f` dmj Drcv`tbi Rb` wbtR`i Nti iw`fZ exR e`envi Kti v`Kb| evsj v`k Kul.Dbqb Ktcf`ikb (we. G. wv. wv) Zv`i exReaB Lvgvi v`tj v`Z wefbaRv`Zi dmtj i Dbz exR DrcbaKti Kl`Ki gv`S wevq Kti; hv I cUqvRtbi Zjvbx Zv AwZ mvgv`| ZvQvov cUqvRtbi we. G. wv. wv. we`k nOtv exR Avg`vbx Kti Kl`Ki gv`S wev`qi e`v`v Kti v`K| we. G. wv. wv. KZK wevqKZ wefbaRv`Ri cwi mSL`vb wbtz (QK-1) t`I qv ntjv|

QK - 1 t Dbz exR wev`qi weeiY (tKwR)|

mb	AvDk avb	Avgb avb	tefiv avb	Mg	tMvj Avj	miv Iv	kxZKvjxb kvK-mw
1990-91	892752	3025545	143685 6	16592150	6256863	49633	5853
1991-92	780939	3126365	2156761	1628425 6	6520372	82786	6990
1992-93	518084	3559431	745740	9667596	6343659	50296	519

(Drm: we. we. Gm. 1994)

Dctiv³ QK nOtv t`Lv hvq th we.G.wv.wv. gj-Zt avb (AvDk, Avgb, tefiv), Mg, tMvj Avj y miv Iv Ges kxZKvjxb kvK-mw eiR wevq Kti v`K| 1992-93 m`b 518084 tKwR AvDk avtbi exR wevq Kiv nq hv AvtMi eQi v`tjvi Zjvbx Kg| GKB eQi Avgb avtbi exR wev`qi cwi gvY wQj 35,59,431 Ges 7,45,740 tKwR hv ceZx`eQi v`tjvi Zjvbx tevk | GB mgq Mg, tMvj Avj y miv Iv I kxZKvjxb kvK-mw eiR wev`qi cwi gvY h_v`tg 96, 67,596 ; 63, 43, 659 ; 50, 296 Ges 519 tKwR hv ceZx`eQi v`tjvi Zjvbx Kg| GtZ cZxqgvY nq th Kl`Kiv wbtRivB dmj Drcv`tbi Rb` wbtR`i DrcbeRv`R tevk e`envi KitQb|

mvi

i v m v i q u b K m v i m t m t e d m j t q t z A v g i v B D w i q v, u l c j m g z v i d m t d u, m g z v i d m t d u, u g D t i u A e c l v k, u R 1/4 m j t d u, m j d v i B Z w m v i e e n v i K t i u m k | Z v t i u k Q y m k Q y A v g v t i t t k D r c b e n q G e s u k Q y m k Q y m e t t k n o t z A v g w b K i t z n q | e w M Z D t i r t M G m e m v i A v g w b K i v n t q u t k | t t k i v m v i q u b K u k i m s v i u e w f b a e K v i L v b v q m v i D r c b e n t q u t k | e Z g v t b t t k K x c w i g v Y m v i e e u z n t o Z v u b m j u L Z O t K (Q K - 2) t L v t b v n t j v |

QK - 2 t i v m v i q u b K m v i u e m t q i u e e i Y |

m t i i b u g	m b (t g u k U b)		
	1990-91	1991-92	1992-93
BDwi qv	1322964	1531518	1493125
uJ. Gm. uc	513704	456843	419262
Gg. uc.	146925	136313	122405
GBP. uc. I Ab vb	10567	2330	--
tgvU	1994160	2127004	2034792

(Drm: u. e. Gm. 1994)

D c t i v o Q K n o t z t L v h v q t h m t i i e e n v i 1991-92 m t b A v t M i e o t i i Z z b v q t e t o t o G e s 1992-93 m t b Z v A v e i K t g t Q | 1990-91, 1991-92 G e s 1992-93 m t b m e f g u l m v i e e n v i i c w i g v Y u j h v m t g 19,94,160 ; 21,27,004 G e s 20,34,792 t g u k U b |

cwb

u e w f b a e t m P c x u z i g v a t g d m t j i R u g t z t m P t q v n q | t t k e Z g v t b t g v U d m j x R u g i c w i g v Y 13.7 u g u j q b t n i i | G i g t a h w i s k c x u z t z t m P c o v b K i v n q t g v U d m j x R u g i 19.46 k z v s t k G e s M Z u b m u z k c x u z t z t m P c o v b K i v n q 4.46% R u g t z | e w k 76.3% d m j x R u g G L b l t m t P i A v l Z i v A v b v m e e n q u b | e v s j v t t k h i r l c p z c w i g v Y e w o n q u k s G i A m g u e z i t y i d t j i u e t g s m t g d m j d j v t b v i R b u e t k l K t i t e r t i v a v b, M g, t l m j A v j y B Z w m d m t j i R u g t z t m P u t z n q | A w a K c w i g v Y R u g t m t P i A v l Z i v A v b t z c v i t j L v u u z K g t e | u e w f b a e h s c w i z i m v r v t h e v s j v t t k K x c w i g v Y R u g t z u e w f b a e Q t i t m P c o v b K i v n t q t Q u b t a e Q t K (Q K - 3) Z v t L v t b v n t j v |

QK - 3 t t m P c o v b u e l q K c w i m s L v b (0 0 0 0 0 t n i) |

h w i s k c x u z t z t m P c o v b K i v n q t g v U d m j x R u g i 19.46 k z v s t k G e s M Z u b m u z k c x u z t z t m P c o v b K i v n q 4.46% R u g t z |

e Qi	t j v v j d u c i u	M f x i b j K c	A M f x i b j K c	M Z u b m u z K	L v j	t g u
1990-91	674.80	615.45	1131.01	432.66	172.86	3026.79
1991-92	684.70	656.00	1293.40	414.10	170.60	3228.80
1992-93	686.20	645.20	1336.10	415.80	185.80	3252.20

(Drm: Kul. WvBw, 1996)

Avc` b i k K

d m j t K u e w f b a e A v c n o t z i q v K i v i R b u e w f b a e c k v i A v c b i k K e e n v i K i v n q | A v c t j v n t j v - A v m v Q v, t c v K v g v K o, t i v M R x e v Y y B u j u k s e v u t g A v u g Y K t i G g b

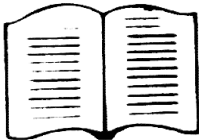
tcvKv ev c0Yx| Giv Kg tenk mevB dmj ev exRi kTjy G,tjvtK `gy Kivi Rb` newfba
Avc`bvkK e`envi Kiv ntq _vtK|

tcvKv-gvKo, tivM-ejvB, AvMvQv I B0jy gvivi Rb` h_vptg KxUvbkK, QTVK bvkK,
AvMvQvbkK I tivWwUmwBW, BZ`w` e`envi Kiv ntq _vtK| G,tjv cvDWi, Zij Ges
`vbr`vi Ae`rq cvlqv hvq| ersj vt`k tek KtqK eQi ati Gt`i e`envi Pjt AvmtQ Ges
w`b w`b Gt`i e`envi tetob PjtQ| 1992 mtb Avc`bvkK e`envi Kiv ntqtQ 7307.22
tgvUK Ub Ges 1993 mtb Zv tetob `votqtQ 7640.49 tgvUK Utb| 1994 mthi c0g
Qqgvtm Gi e`envi ntqtQ 4744.8 tgvUK Ub|

QK - 4 t ersj vt`k Avc`bvkK e`envi (tgvUK Ub)|

mb	Kv bvkK			QTVK bvkK		AvMvQv - bvkK	tivWwU -mBW	tgvU
	`vbr`vi	Zij	cvDWi	cvDWi	Zij			
1992	5601.01	1045.1	79.30	28.88	421.41	89.86	41.64	7307.2
1993	5819.65	1003.7	84.15	63.41	502.07	111.38	57.11	7640.5
1994 (RivyRty)	481.19	481.2	34.33	4.95	228.37	80.54	26.60	4744.8

(uDrn: e. we. Gm. 1994)



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Kvl.DcKiY c0vYZ `0cKvi - e`MZ Ges Ae`MZ| e`MZ DcKiY ntjv exR, mvi, cvb
Ges Avc`bvkK| KI`Kiv tenki fvM tjtTb wbrT`i Drcw`Z exR e`envi Kti Ges
mvgvb` cwi gvty we. G. wv. wn. n0tZ μq Kti | ersj vt`k Ki KI`Kiv c0vbZ BDwiqv, wU. Gm.
wv. Ges Gg. wv. mvi e`envi Kti | tgvU dmj x Rvgi 19.46 kZvstK hvSK c0vZtZ Ges
4.46 kZvstK MZvbMvZK c0vZtZ tmP c0vb Kiv nq| Aewkó 76.3% dmj x Rvq GLbl
tmtpi Avl Zvq Avbv nqv| Kvl.tjtT Avc`bvkK e`envi w`b w`b tetob PjtQ|



cvfVvEi gj-vqb 1.5

mWVK DEti i cvfkqUK wPy (✓) w`b

1/ DcKiY KZ cKvi ?

K) Pri cKvi L) `B cKvi M) wZb cKvi N) cvEi cKvi |

2/ e`MZ DcKiYtK KZfvM fvM Kiv ntqtQ ?

K) Pri fvM L) `BfvM M) wZb fvM N) cvEi fvM |

3/ i vnvqubK mvti i e`envi Kx i Kg ?

K) eZgvtb AvtMi Zjbrq evotQ | L) w`wZkxj Ae`vq AvtQ |

M) eZgvtb AvtMi Zjbrq KgQ | N) KI tKiv mvi e`envi Ki tQbv |

4/ eZgvtb tgvU dmj x Rvgi KZ fvM tmP cDvb Kiv nq ?

K) 20.52 fvM L) 25.30 fvM

M) 23.92 fvM N) 30.72 fvM |

5/ dm t j i Avc` aYsm Kivi Rb` Kx e`euZ nq ?

K) Avc` bvkK M) AvMvQvbkK

L) KxUvbkK N) `j YbvK |

^Zj exR RvZiq km`

mwi lv ersj vt`ki c`avb ^Zj exR RvZiq km`| eZgvtb ^Zj exR RvZiq km` wntmte t`tk mqvextbi Pvl nt`Q Ges mqvextb Pvl i D34j m`ebv itqtQ| wKŠ`mqvextb μvm Kivi tgvkb bv _vKvq Avgtv`i tZtj i NvUvZ ugUvtZ c`Z eQi 3 t`tk 6 nvRvi ugvi qb UvKvi mqvextb ^Zj wef`k n`otZ Avg`mb Kitz nq| Gt`tk ^Zj exR RvZiq dmtj i Rvgi cwi gvY w`vZKxj itqtQ| ^Zj exR ktm`i djb ep`xi jt`j` t`tki Kul.Mtelbv c`Z`vrb mgr mwi lvi 10uU, Pxbver`vtgi 6uU, MR`vZtj i 3uU I wZw i 1uU D`Pdjbkxj RvZ D`v`eb Kti`tQ| G`tjv Pvl i Avl Zvf,³ Rvgi cwi gvY evortZ cvitj ^Zj Avgtv`mbi cwi gvY Ktg Avmte Ges t`tki A`vZtZtZi ht`o Ae`vb ivLte|

ivevi

t`tk ivevi Drcv`b ep`x cvlqvq KvPr ivevi Avg`mb μgk nvm cvt`Q Ges G LvtZ D`tj L`thvM` cwi gvY `et`wK g`v`i mvtkt nt`Q| eZgvtb (1994-95) A`eQti GB mvtktqi cwi gvY c`q 20 t`KwU UvKv| wefbaivevi evMvb n`otZ eZgvtb c`q 3 nvRvi Ub KvPr ivevi Drcv`b nt`Q hv w`tq t`tki 250uU ivevi RvZ `e` Drcv`bKvix c`Z`vrb tgvU eml`R Pmn`vi 30% ugUvtbv m`e nt`Q|

dj, dj I kvKmã

XvKvq eZgvtb c`Zw`b 5 j`j UvKv g`tj`i ZvRv dj wefbaivevi nt`Q|

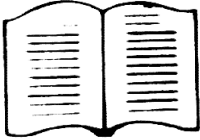
ersj vt`tk dj GLb emYwR`K cY`| XvKvq eZgvtb c`Zw`b 5 j`j UvKv g`tj`i ZvRv dj wefbaivevi nt`Q | t`tk eZgvtb 2 nvRvi weNv RvgtZ emYwR`Kfite dtj i Pvl nt`Q&| c`q 15 nvRvi tjvK c`Z`j Ges cti`v`fite dj e`emvi mvt`_ RvZ| 1993-94 A`eQti ersj vt`k 12 j`j UvKv g`tj`i ZvRv dj tm`v` Avite i Bmb Kti |

dtj i Drcv`b w`b w`b ep`x cvt`Q Ges th cwi gvY Drcbent`Q ZvtZ t`tki Pmn`v ci-Y nt`Q| KvUvj mn wKQydj wef`tk i BmbI nt`Q | eZgvtb ersj vt`k n`otZ 15uU i AwaK t`tk 48 cKv`i i kvKmã i Bmb nt`Q | 1992-93 A`eQti 313.5 ugvi qb UvKvi Ges 1993-94 A`eQti 323.5 ugvi qb UvKvi m`ã wef`tk i Bmb Kiv nq| t`tk m`ã Drcv`b Kivi jt`j` Kul.MtelYv c`Z`vrb mgr wefbaRvtZi D`P dj bkxj RvZ D`v`eb Kti`tQ|

Dcti i AvtjvPbv n`otZ GUV `uó th ersj vt`k Kul i Dci wbf`Kxj nI qv m`Ej wefbaKvity Gt`tki dmj mgr A`vZK t`j`i Avkvbjc Ae`vb ivLtz cvitQ bv| c`KvZK `h`vM, m`gZ cwi i bvi Afive, Kul.bmZgvjv ev`evqtb Amdj Zv, KIKt`i AAZv I `wv`? MtelYv I m`v`vity g`ta` thvMv`h`vMi Afive BZ`w`B c`avb KviY| t`tki A`vZK t`j`i dmtj i Ae`vb Avtjv evote GUVB Avgtv`i c`Z`vkv|



Ablyj b (Activity): òesj vt`tki A_òxizZ dmtj i Ae`vbó kxl R GKul mswq]B i Pbr wj Lly|



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esj vt`tki kZKiv 68.5 fM gvbyl i tckv ntjv Kwl. | t`tki tgvU Af`šlxY Drcv`tbi 35% Ges RvZixq Avtqi 39.37% thwMvY t`q GB Kwl. | MZ wZb`kK t`tki Lv` Drcv`b còq wY tetotQ| avb Avgtv`i còvb`vbrRvZixq Lv`km Ges Gi ciB Mti Ae`vb| esj vt`tk D`weZ D`P djbkj avb I Mti RvZi mSL`v h_vmtg 39 I 16 hvi tewkj fVMB KIK chiq Pvl nt`Q | cvU I Pr h_vmtg esj vt`tki còvb I wZixq còvb A_Rix dmj | th_tjv iBmb Kti Gt`k còz`et`wkK gyv Avq Kti | t`tk eZgvtb evbwR`K wfvEz dz Drcw`Z nt`Q | A_òwZK t`t` dmtj i Ae`vb μgvštq evotQ|



ciVvEi gj`vqb 1.6

mivK DEti i ciKk`UK iPý (✓) w`b|

- 1| ersj vt`ki kZKiv KZ fVM gvbly dmj Drcv`tb mbtqwmRZ ?
K) 50.5 fVM L) 68.5 fVM M) 70.7 fVM N) 62.5 fVM|
- 2| RbmsL`v ep`xi dtj Lv`" km" Kx Ae`vq AvtQ ?
K) evotQ L) KgvtQ M) w`wZkxj AvtQ N) Ly tevk KtgtQ|
- 3| MZ 25 eQtI Ptj i Drcv`b KZ `Y ntqtQ?
K) cvPl, Y tetotQ L) `B, Y KtgtQ
M) `B, Y tetotQ N) wZb, Y tetotQ|
- 4| Drcw`Z cvU I cvURvZ `te`i kZKiv KZ fVM i Bmb nq ?
K) 100 fVM L) 70 fVM M) 50 fVM N) 60 fVM|
- 5| mbtai tKvbU wef`tk i Bmb nq ?
K) Mg L) Zzv M) AvL N) Pv|
- 6| mi Kvfi i ivR`^Av`vtqi Ab`Zg Drcv`tb dmj wU ?
K) AvL L) avb M) ZiqvK N) Pv|



Peršl gj'iqb

mswǵB I iPbigj-K cǵæ

- 1/ Kwl.ej tZ Kx eSvq?
- 2/ Kwl.i , iǵj Avtj vPbv Ki ly|
- 3/ evsj vt`tki f-cKwZi eYǵv w`b|
- 4/ evsj vt`tki tǵMij K Ae`v eYǵv Ki ly|
- 5/ Avenrl qv I Rj evqej tZ Kx eSvq?
- 6/ Avenrl qvi Dcv`vb , tǵvi big wj Lly|
- 7/ Kwl.tgšmg mǵtÜ mstǵtǵ Avtj vPbv Ki ly|
- 8/ evsj vt`tki wewfbæbvĀtj RtbǵGgb me MvQ cvj vi big wj Lly|
- 9/ MvQcvj v I RxeRšf Dci Rj evqj cǵve eYǵv Ki ly|
- 10/ g`vbǵMǵf ebvĀj mǵtÜ Avtj vPbv Ki ly|
- 11/ evsj vt`tki eb`ci cmlLiv tKgb cwi tǵtk evm Kti tm mǵtÜ Avtj vPbv Ki ly|
- 12/ Kx Kx LvǵZ evsj vt`tki f-fvM e`eüZ nt`Q Zv wj Lly|
- 13/ meǵvU dmj x Rvǵ mǵtÜ Avtj vPbv Ki ly|
- 14/ km`Pvtǵi i wbeoZv mǵtÜ Avtj vPbv Ki ly|
- 15/ dmj cwi msL`vb ej tZ Kx eǵSb? cvǵUi Pvl w`b w`b Kǵg AvmǵQ tKb?
- 16/ Kwl.DcKiY ej tZ Kx eǵSb? Kwl.DcKiY , tǵvi big wj Lly|
- 17/ evsj vt`tki KlǵKiv tKvb tKvb Drm t_ǵK exR cvb Zv eYǵv Ki ly|
- 18/ KlǵKiv tKvb tKvb ivmǵqubK mvi e`envi Ktib? MZ wZb eQǵi i mvi weZiǵYi aviv t`Lvǵ|
- 19/ tKvb tgšmǵg tmǵPi cǵqvRb temk Ges tKb Zv Avtj vPbv Ki ly|
- 20/ wewfbæAvc`biktǵKi big wj Lly Ges tKb Gǵ`i dmtǵi RvǵtZ e`envi Kiv nq?
- 21/ evsj vt`tki A_ǵmZtZ cvǵUi Ae`vb Avtj vPbv Ki ly|
- 22/ evsj vt`k Kx Kx dmj Avǵ`wǵb I iBwǵb Kti Zvi Zwǵj Kv w`b|
- 23/ Wǵj I `Zj RvZ ktm`i Aver`thwM` Rvǵi cwiǵvY I dj b w`b w`b Kǵg hvǵ`Q tKb Avtj vPbv Ki b|



DĖi g~~ę~~v

cW-1.1:

1| N, 2| N, 3| M|

cW-1.2:

1| L, 2| N, 3| M, 4| L, 5| M|

cW-1.3:

1| K, 2| M, 3| N, 4| L, 5| M, 6| K, 7| N|

cW-1.4:

1| M, 2| L, 3| L, 4| N, 5| L, 6| M, 7| L|

cW-1.5:

1| L, 2| K, 3| K, 4| M, 5| K |

cW-1.6:

1| L, 2| K, 3| M, 4| L, 5| N, 6| M|

BDřbU 2 cı'cml, grm" I ebm²ú`

BDřbU 2 cı'cml, grm" I ebm²ú`

gvVdmj Qvov Avgvř`i
Kul.i cāvB mve-tm±i , t j v
nōjv cı'cml, grm" Ges
ebR m²ú` |

Avgvř`i A_Ǿmiz Kul.iřvEK| gvVdmj Qvov Avgvř`i Kul.i cāvB mve-tm±i , t j v nōjv cı'cml, grm" Ges ebR m²ú` | cı'cml nřZ Avgiv`gr, wlg, gısm, řRe mvi, Řjy vnb I ktg kır³ cvB| ZvQvov cıi Pıgov ißvnb Kři gj`erb `ef`ıkk gřř ARǾ Kiv nq| evsjřř`tki cǾZ`K emotřZB řKvb bv řKvb cı'cml cij b Kiv nq| cmlı gřa" nwm, gjyM, Keřzi, řKvřřj I wZwZı Ges cıi gřa" Mi-gıwl, QvMj Ges řfořB cāvB| Zře řKD řKD mL Kři řNvovl cij b Křıb|

Lvj -ıej , b`x-bvjv, cřkř-ıwłV, newřbæeo Řjvkq Ges řř`tki `wřřřř mgřř ıbtq Avgvř`i evsjřř`k| grm" evsjřř`tki Ab`Zg cǾKıřK m²ú` hv řř`tki A_ǾmızřZ AZ`řř , iřcřř Ae`vb ivLřQ| Af`řřıřY gřř I ex Řjvkřř řř`ycıbi gvQ Ges mıgvřřK GjvKvq řjvbr cııbi gvQ cvl qv hvq|

evsjřř`tk eb-m²ř` ŘvZıq A_ǾmızřZ GK , iřcřřAe`vb ivLřQ| ebR-m²ú` řř`tk Avgiv KřV, Lıř, Řjy vnb, řMřLř` I ıkkřıi Křřřřř řř`tk | ŘbmsL`ıv ewx I Acıı Kır Zřřř ebR m²ú` ařřřmi đřj evsjřř`tki cııřřřřř řř`tkı AvR GK gvıřřřř řř`tkı m²řřřřř

evsjřř`tki AřřZ 111.5 ıgvıř qb gvby, 57 ıgvıř qb Mew` cıi Ges 137 ıgvıř qb nwm-gıyM i řř`tk| řř`tkı řř`tki gřa" B ıgvıř qb řn±i Řıř ebvAřj i AřřMřř | 1994-95 A_ermıř grm" Drcı`b nřřřřř 12 j vL Ub hvı gřa" 9 j vL Ub Af`řřıřY Řjvkq řř`tk Ges emK 3 j vL Ub mıgvřřřřK GjvKv řř`tkı

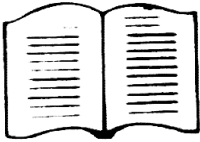
G BDřbřU 5ıU cvřř evsjřř`tki cı'cml I grm" m²úř`i cıııřřř, cıımsL`vb, ŘvZıq A_ǾmızřZ Gř`i Ae`vb, evsjřř`tki ebR-m²úř`i , iřř; cııřřřřř I A_řřřřř newřbæ ebR eřřřı cıııřřř I cıımsL`vb Avřř vPbv Kiv nřřřřř

cw 2.1 esj v`tki ci`cwlI cwiPvZ I cwiMSL`vb



G cvl tkfI AvciB

- ◆ esj v`tki Miygnl, QvMj, tfoV, nuz, gjm Ges Keyzi Rivmgni bvg ejtZ cvi`teb|
- ◆ D³ ci`cwl, tji vi `enkó` ejtZ cvi`teb|
- ◆ esj v`tki ci`cwlI cwiMSL`vb RivtZ cvi`teb



esj v`tki ci`cwl ejtZ tm me ci`cwltk eSvq hrf`i DrcvE`j esj v`tkB | Gt`i gta` Miygnl, QvMj, tfoV, nuz, gjm Ges KeyziB cãvb |

miz`Kvi At`esj v`tk Miy tkvb Awegk`a (Pure) wKsev Dbz Riv tbB| Ab` t`k t`tk Avbv tkvb Awegk`a Rivzi MiyGt`tki tkvb Pvlxi evotZi t`Lv hvqvb| Averi Ggb tkvb wK; D`P-Drcv`bkij Rivzi esj v`kx Riv wntmte MpxZ n`q D`vnb| esj v`tki weifbæ AÅtji Miytm me AÅtji bvgvbyvti cwiPZ| thgb PÆMtg AÅtji Mi`JK PvUMBqv, crevri Mi`JK crevriBqv Ges `fi`tei Mi`JK `fi`ex etj | Gme`vbxq bvtgi wK RivZ 3-7 wj Uvi chSf`y w`tq `v`K| mgqgz myg Lveri c`vb I hZæbtj t`kx MiyntZ Awak cwiqvY`y cvlqv tgvUB Amæ`bq| G RivZ, tji vi ga` n`Z ubePb I w`bqvZ DrKó. Rivzi I w`tq msKivq I cRb`tbi gva`tg mntRB Dbz Rivzi, Yiej x` t`kx Riv mgni gta` cãvvi Z Kiv thtZ cvi`i |

mgqgz myg Lveri c`vb I hZæbtj t`kx MiyntZ Awak cwiqvY`y cvlqv tgvUB Amæ`bq|

esj v`tk wR`^DrKó. Rivzi tkvb gnul tbB| G t`tk th mKj gnul t`Lv hvq G, tji vi c`q me, tji vb we`k t`tk Avbv| G t`tki Avenil qvq j wj Z cwj Z Ges esk we`tji gva`tg Giv eZv`tb Gt`tki gnul bvtg cwiPZ| esj v`tk fvi`vnx ev KvRi Rb` Rjv gnul ev tmqvæú gnul Ges `y Drcv`tbi Rb` w`bjv, gjov, Kwi`I i w`f Rivzi gnul t`Lv hvq| gnul cwb Ges gnul Df`q RivMvq `v`K| Zte Giv cwb`Z `v`KtZB te`k c`v` Kti | gnul i Rb` Rjv`kq, tWiev, Lv`, MZ`wej, BZ`w`i c`qvRb thLv`tb Zviv bvK Aew` Wæ`tq iv`L| Avgv`i t`tki gnul i `y t`qvi ¶gZv` w`bK 5-15 wj Uvi |

e`vK telzj bvgK QvMj Gt`tki L`B cwiPZ Riv| Giv Aí eqtm MfæZx nq Ges Qqgvm Ašif Ašif ev`Pr cãve Kti, Ges GK mit`_ GKwaK ev`Pr cãve Kti `v`K|

esj v`tki c`q cãZiU emotZ QvMj t`Lv hvq| QvMj cvj b Gt`tk L`B cvj`tbv ti I qvR| e`vK telzj bvgK QvMj Gt`tki L`B cwiPZ Riv| G Rivzi QvMj Gt`tki Rj evqZ emev`mi L`B Dc`thvMx| Giv Aí eqtm MfæZx nq Ges Qqgvm Ašif Ašif ev`Pr cãve Kti, Ges GK mit`_ GKwaK ev`Pr cãve Kti `v`K| esj v`tk thLv`tb ci` Lv`i L`y Afve, tmLv`tb Kg Lver`i gvm Drcv`tbi Rb` QvMj GKwU DrKó. c`v`x|

t`tki weifbæAÅtj cPz` mSL`K t`kx Rivzi tfoV t`Lv hvq| tfoV `j ex Ae`vq `v`KtZ fiv ev`tm| QvMj i Zz`bvq esj v`tk tfovi mSL`v Kg| Gt`tki tfoV AvKv`ti tQvU I weifbæ i`stqi nq| Giv Kg Drcv`bkij RivZ| cw`exi tkvb tkvb t`tk tfoV cvj`tbi cãvb D`t`tk` n`tjv Dnv n`Z ckg msMh` Kiv| Zte Gt`tk tfoV gvstmi Rb` cvj b Kiv n`tq `v`K|

Mitg Mpt`i evotZ Qvov Ae`vq th mg`l gjm Pto teovq Zviv t`kx Rivzi gjm| Giv mavi YZt Ni `gvi I evoxi Av`k cv`k t`¶tZ Lvqv`i Pto teovq I Lv` Kwo`tq Lvq| Giv AvKv`ti tQvU, w`vg Kg t`q| Gt`i t`n m`mWZ I k³| Giv L`y Pjv`K I mZK` t`kx gjmMi gta` w`KQy`v`w` `enkó` c`y`Riv Av`Q| Gt`i gta` AmQj ev`j ov`btqi gjm, cvj Ki`Y` Mkev ev Mjv tQjv gjm, PvUMtqi gjm Ges gv`vq cvj`tki tMj Suv` gjm cãvb| AmQj ev`j ov`btqi gjm t`L`tZ my`i w`KŠ` Zviv PÅj I w`nsm`l G Rivzi gjmMi gta` tgvim`j ov`btqi

Kul. I cju Dbq b ǵ

Rb` e`envi nq| joiBtqi tǵviM tek Pov `vtǵ weu nq| AwQj gjuM eǵǵbenoqv tRjvi
 mi vBj I PÆMǵgi Avtǵvivi vbrq t`Lv hvq| Mjv tQvj v gjuMi Mjvq tKvb cij K _vtK bv|
 Giv AvKvǵi eo| Mjvi dǵ tek eo Ges jvj istǵi | wntj U tRjv I weifbæitb weuQbæitb
 G gjuM t`Lv hvq| LwU PvUMtǵi gjuM PÆMǵ tRjvi Avtǵvivi vbrq t`Lv hvq| Giv
 AvKvǵi eo, Mjv jǵ, gv_v tQvU, gv_vq Sǵ _vtK| gv_vq cij tKi tMj Sǵ gjuM
 evsj vt`tki cǵ meP B t`Lv hvq| Gt`i gv_vi cij K tMj nǵ GK „Q Sǵ `Zix Kǵi | Sǵ
 I Mjvi dǵ Lǵ tQvU I jvj istǵi |

Mǵ MǵÄi cǵǵ wej ev tWveq th mg`Inva Pto teovtZ t`Lv hvq G, tǵv t`kx RvtZi cǵZ
 nǵw| Giv AvKvǵi tQvU I wWg Kg t`q| t`kx nva AZ`šl Kó minòzPAj Ges mZKǵ Gt`i
 cij tKi is weifbæaitbi nǵ _vtK| t`kx nva gta` bvtMKǵix, gwU nva, miv nva, ivR nva
 cǵwZ. Dǵj-LthvM`| bvtMKǵix Ges gwU nva wntj tU cvl qv hvq Ges miv nva evsj vt`tki
 meP t`Lv hvq| ivR nva tKn tKn mL Kǵi cij b Kǵi b| ivR nva Lǵ Kg wWg t`q|

KeZi kǵšl cǵx wntǵte weuPZ| Giv Lǵ myi I kvšl cǵx Ges wbtRt`i Lvevi
 wbtRivB mSMǵ Kǵi Lvq| KeZi evovtZ wKsev tcvov evovtZ _vKtZ cǵw` Kǵi| Avgvt`i
 t`tk AǵtK mL Kǵi KeZZi cǵtj b| Giv cǵZ t`o gǵm GK tRvov evPv t`q| KeZi i
 evPvi gǵsm Lǵ myr` y RvZ I eYAbǵvǵi KeZi weifbæAvKvZ I istǵi nq| th me RvZ
 Avgvt`i t`tk t`Lv hvq Giv nǵj v Rvj vj x, wmi vR, j tǵǵ I tevM`v x|

OK t ci cǵLi msL`v I Drcv`b

K. tǵvU msL`v

Mewi ci I nuogjuM	msL`v
Mi	2,33,86,000
gǵnI	8,02,000
QvMj	3,21,86,000
tFov	10,92,000
gjuM	12,42,79,000
nva	1,35,68,000

L. ewl R Drcv`b

gǵsm	5,04,702 tǵwUK Ub
`ǵ	14,11,959 tǵwUK Ub
wWg	253,96,96,000 wU

(Drm: Kul. Wǵqwi, 1996)



mvi gg®
 Miygini, QmJ, tfoi, nra, gjm Ges Kezi ubqB Mpcwiz Z ci`cmlLi RMr| PivMvBqv,
 ^fi ex, cvebvBqv brtg `vbq RivZi MiyAvtQ| guntli gta` Rjv guntli clavb` tek| e`vK
 te2j QmJ Qvor Ab` tKvb QvMtji RivZ Gt`tk tbB|weirfbæAAtj AvQj, MjvtQijv,
 PivMvBqv Ges gv_vq tMij Svb gjm t`Lv hvq| Avgt`i t`tk th me nra t`Lv hvq tm, tjv
 ntjv cawZ nra, mv`v nra, bvtMKix I ivRnra| Keztii gta` Rivjx, mivRx, jtjv I
 tevM`v`x RivZ Gt`tk t`Lv hvq| weirfbæci`cml t`tk Avgiv wG, `x I gism cvB|



cvVĒi gj'vqb 2.1

mV/K DĒti i cvtkqUK wPy (✓) w b

- 1/ f i ex tKvb RvZi Mi y?

K. Awegk ^a	L. wqk ^a	M. t`kx	N. Dbz
-----------------------	---------------------	---------	--------
- 2/ gwnl tKv_vq_vkZ tenk cQ` Kti ?

K. iKtbr `vfb	L. DpZ`vfb	M. ZY.fvgtZ	N. Rj vk tq
---------------	------------	-------------	-------------
- 3/ eisj v`tki wbr`QmTj i RvZ tKvbU ?

K. e`vK te1/2j	L. wUx	M. cvUbrB	N. hgvrcvix
----------------	--------	-----------	-------------
- 4/ tKvb RvZi gjwM j ovB Kti ?

K. Mj v tQj v	L. AvQj	M. PvUMtqi gjwM	
N. gv_vq cvj tKi tMj S w gjwM			
- 5/ t`kx RvZi gjwMi wlg civoi qgZv tKgb ?

K. tgvUvgw	L. Kg	M. tenk	N. gvSwi
------------	-------	---------	----------
- 6/ nwa tKv_vq_vtK ?

K. cmbtZ	L. gwUtZ	M. MtQ	N. gwU cmbtZ
----------	----------	--------	----------------
- 7/ bvtMk;ix nwa eisj v`tki tKvb AĀtj cvl qv hıq?

K. XvKv	L. i vRkvnx	M. w`brRcj	N. wmtj U
---------	-------------	------------	-----------
- 8/ KeZi Kgvtm GK tRıov evPv t`q ?

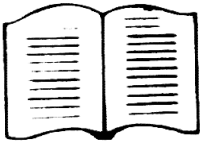
K. t`ogıtm	L. `B gvıtm	M. wZb gvıtm	N. Qq gvıtm
------------	-------------	--------------	-------------

cw 2.2 ci`cwiLi RvZ cwi`PvZ, RvZxq A_`BvZtZ ci`cwiLi Ae`vb



G cvV tkfI Avciob

- ◆ ci`cwiLi RvZ cwi`PvZ jvf Ki`tZ cvi`teb|
- ◆ D`tj-L`thvM` RvZi ci`cwiL_`tjvi`ewkó` eYBv Ki`tZ cvi`teb|
- ◆ tKvb RvZi ci`cwiL Kx KvR e`eüZ nt`Q Zv RvbtZ cvi`teb|
- ◆ RvZxq A_`BvZtZ ci`cwiLi Ae`vb gj`vqb Ki`tZ cvi`teb|



ci`i RvZ cwi`PvZ

Mi`yRvZ

- 1| `jai Rb` - jvj wÜx, kvxl qvj, _vcfKvP, njvob wclvRqvb, Rvwm,`_tqYin, Avqvi kvqvi, ev`vqx mBm|
 - 2| KvRi Rb` - nwi qvbn, evMbvix, avbæI _vcfKvP |
 - 3| `g I KvR Df`tqi Rb` - nwi qvbn I _vcfKvP |
- wb`wKtqKwU Dbz RvZi Mi`y cwi`PvZ t`qv ntj vt kvxl qvj

kvxl qvj RvZi Mvfx
 `wbK 9-10 wj Uvi `g t`q
 Ges clq 280 w`b `yeZx
 _vtK| ej` ev lwo nvj
 PftI i Abg`thvMx|

cwK`v`bi cv`Ave c0`tki gU`Mvgvix Gi DrcwE`j | Mvfx AvKvti wKQv j`v, nvj Kv-cvZjv, tQvU cv I MwZ axi | Gt`i gv_v AvKvti tQvU Ges Kcvtj i`vb DPz`j wZ Kv I bvfK S`zv`bv| Pz I Mj K`f tek eo| I jvb eo I S`z`S| Mv`qi is nvj Kv jvj ev nvj Kv nj`y| `wbK 9-10 wj Uvi `g t`q Ges clq 280 w`b `yeZx _vtK| ej` ev lwo nvj PftI i Abg`thvMx|

jvj wÜx

cwK`v`bi wÜzc0`tki KivPx, jvmt`ejv I nvq`ivev` Gi DrcwE`j | Mv`qi is jvj etj GtK jvj wÜx etj | GwU tQvU gv_vl qvjv tgvUv I LvUv RvZi Mi`y wks tgvUv I mvg`tbi w`tK evKv`bv| Kcij cl`l Kv`tbi AvKvi gvSvix, bxtPi w`tK S`zv`bv, I jvb tek eo I mMwZ| bvfK eo I S`zv`bv| G Miyc0ZKj Ae`v mn` Ki`tZ cvti Ges `gI t`q tenk| `wbK 8-10 wj Uvi `g t`q Ges clq 350 w`b `yeZx _vtK|

_vcfKvP

cwK`v`bi wÜzc0`tki _vcfKvP tRjvq Gi DrcwE`j | GwU k³ I gReZ Mo`tbi ga`gvKvi kv³kijx ci | ej` Mvix I jvzj Uvbi KvR e`eüZ nq| Mvfx tenk cwi`gvY `g t`q| `wbK `g t`q 9-11 wj Uvi Ges eQtii 300 w`b `yeZx _vtK| Mv`qi is mv`v| wks I Pz ga`g AvKvti i |

njvob wclvRqvb

nj`v`Üi wclvR`vÜ c0`tki Gi DrcwE`j | `g vj RvZi Mvfxi gta` GRvZ Zj biv j Kfvte eo| kixi i mvg`tbi Ask wPKb Ges I jvb tek eo| kixi tek tckx h`y| Mvfx_`tjv kvš`fvtei wK`S` lwo, wj e` tgRvRi | Mv`qi is Kv`tjv mv`vq wPv Ges G`tqi th tKvb GKwU c0`vb` _vtK|

Rum

BDtvc I Avtgi Kvq t`Lv hvq | `xvj RvtZi gta` Rvmmeftcflv eo | t`tni MVb Dbz I myi | I jvb tek eo | Ptd tbB | Mtqi is jvj, nRnYv I tj tRi is Kvqv | tMPrity AF` | evrmi K `x Drcv` b 2,750–4,000 wj Uvi |

nwi qvbn

nwi qvbn RvtZi Mvfx `nbK 9–10 wj Uvi `x t`q | ej `j v2j I Mvox Uvbi KvR e`eüZ nq |

fvtZi nwi qvbn AAjt i G Miyv`v, `xN`D`P I eij ô | nks j`p, nPKb I gmY | t`tni eY` mv`vU ev nvj Kv ami | `nbK 9–10 wj Uvi `x t`q | ej `j v2j I Mvox Uvbi KvR e`eüZ nq |

eMbvix

cvtK`vbi mÜzAAjt Gi Drcv`j | Miy`nRvq, eij ô, `p I kixi mYvZ | Mtqi is mv`v Ges Kvai is Kvqv | `nbK 2–3 wj Uvi `x t`q | GB MiyKóminözGes Mvox I j v2j Uvbi Rb` Dc`hvMx |

avb

cvtK`vbi Bmjvgev` AAjt i GB MiyMvox I j v2j Uvbi Rb` e`eüZ nq | kixi k³ I gReZ | G Miy`x Kg `x t`q |

gintli RivZ

evsj v`tk nR`v`Kvb DrKó. RvtZi gvnI tbB | evni ntZ Avbv RvtZi gta` gjov, bxjv, iwf I KÜ D`j -L`hvM` | gjov RvtZi gvnI B evsj v`tk tevk t`Lv hvq | G RvtZi cwi nPrZ nbt`v`qv ntjv |

giov

giov RvtZi gvnI Kó minözGes evsj v`tki Rj evqz Dc`hvMx |

fvtZi wj-x I nwi qvbn Gt`i Drcv`j | kixi eo, cv t0vU, nks LvU I evkvbv Ges Kvqv | Prgov Kvqv Ges ckgI Kvqv | `x gintli gv`v mYvZ nK`c`jy gintli gv`v fviX I tgvUv | Kcvji m`yfvM Plov I D`z Giv Kó minözGes evsj v`tki Rj evqz Dc`hvMx |

QvMjt i RivZ

Dt`k` Ablyqx QvMjt i RivZK nbaiv nLZ fvtM fvm Kiv ntqtQ:

1 | `x Drcv`bKvix RivZ t m`vbb, G`vstjv, b`yqv, `vgvmKvm, n`UK Gj cvBb, UsMb evM, hgv`cvix, evi evix, m `vbxqv |

2 | gism Drcv`bKvix RivZ t e`vK tel2j, tevqi, hgv`cvix, n`Rqv, tg-U-A, tKv`S tKUR |

3 | Prgov Drcv`bKvix RivZ t g`jevM, e`vK tel2j |

nbt`hgv`cvix I e`vK tel2j bigK `v RvZ m`Ü Avtj vPbv Kiv ntjv t

hgv`cvix

M2v, hgv`v b`xi ZxieZ`AAj G QvMjt i Drcv`j | fvtZ G QvMj tevk t`Lv hvq Zte evsj v`tki tKvb tKvb AAjt n`v`Bfite G QvMj bRti cti | `nRvq, `xN`c`n`kó

fvi Zixq G QvMj ami ev`vqx, KLtbn Kvttj v ZvgvU ev mv`v istqi ntq _vK | Gt`i nks P`vPv
I LvtUv Ges clq 10-12 BwA j ` Sjs`Kib enb Kti | G RvZixq QvMjtj i `Diat gvts j `af
ZjZtj Awak cwi gvty tj vg _vK | G RvtZi QvMj `wbK 2-3 vj Uvi `y t`q |

e`vK te/zj

e`vK te/zj ersj v`tki
Kvttj v QvMj bvtg cwi vPZ
Ges t`tki mePB t`Lv
hva |

GvU ersj v`tki Kvttj v QvMj bvtg cwi vPZ Ges t`tki mePB t`Lv hvq | Gi kixi LvtUv Ges
big Kvttj v tj vg `jiv AveZ | Gi Kvb`_tj v mvavi YZt Dci w`tk Lvov _vK | nks Kvttj v Ges
2-3 BwA j `af nq | Af eqtm Mf@Zx nq Ges Oq gym ci ci ev`Pr t`q | GRvtZi Lvni
gvsm AvZ DrKó. | G RvZixq QvMjtj i Pvgov gmY I tgvj vtqg nq Ges eq` QvMjtj i mv`v ev
ami etYP `wv _vK |

tfovi RvZ

tfovi RvZtK vbatj vLZ vclq`_tj vi Dci vfvE Kti tkvYvefvM Kiv nq |

- 1 | gvsm ev ckg Drcv`tbi nvti i Dci vfvE Kti |
- 2 | gtl i istqi Dci (mv`v ev jvj) vfvE Kti |
- 3 | nks Gi Dcv`vZ Ges Abzv`vZi Dci vfvE Kti |
- 4 | DrcvE Abjvqx Gj vKvi Dci (DBzfvq, ceZ, vb`vvg) vfvE Kti |
- 5 | cktgi vevfbzv Abjvti |

Dcgvv`tk th mKj RvtZi tfovi t`Lv hvq tm`_tj v ntj v wevi K, I qvRvi, KvMvb, tj vvn,
nvi bvb, `vgvb, BZ`v | tj vtgi Rb` vL`vZ Ggb `v RvZ m`vU vbt`Avtj vPbv Kiv ntj v |

tgvitbv

G RvZixq tfovi DrcvE`j t`vb t`tk | Gt`i gly I cv mv`v, Kib I cvtqi tMrovjxtZ
jvj tP ev`vqx isGi `vM t`Lv hvq | Gt`i cv Ges gv`vi tenki fivMB ckg Oviv AveZ |
Pigovi `Yv`_tYi Dci vfvE Kti tgvitbvK vZbvtM fivM Kiv ntqtQ | h_v t

G -UvBc: tgvUv RvZ | tfovi gv`v ntZ tj tRi tMrov chSltKvKovtbtv cktg AveZ _vK |
ve-UvBc: Nvtai ckg e`Zix mg`tkixi Atc`vKZ.Kg cktg AveZ _vK |

vM-UvBc: Pvgov tMjv`cx is Gi | ckg Zjvbg j K fite gmY | gvstmi gv`v Ab` `RvtZi
Zjvbg DEg |

tivgbx bvm

Bsj `vtUi tivgbx bvm`AA`_tj Gt`i DrcvE`j | Giv metPtq tQvU RvtZi tfovi | Gt`i cv
tQvU I mv`v | gly mv`v Ges Kcvtj GK `Q ckg _vK | Gt`i nks tB |

cvLi RvZ cwi vPvZ

gvjMi RvZ

nij Kv RvZ I fvi x RvZ -G `vKbtZ tgv MgjvM`K fivM Kiv hvq | th me gvjMi I Rb Kg
Zviv nvj Kv RvtZi Ašf` ; thgb- tj Mnb`Ges th me gvjMi I Rb t`kx Zv ntj v fvi x RvZ ;
thgb- tivW AvBj `vU tiW | Dbz LvM gvjMi DrcvE`j Abjvti Giv Avtgvv Kib, GvKqMUK,
Bsvj k I fga`mvMiq AA`_tj i RvZ vntmte cwi vPZ | Gt`i gta` th me RvZ ersj v`tk
cwi vPZ Zvt`i m`vU vbt`P Avtj vPbv Kiv ntj v:

tnvBU tj MnY®

GuU fga`mvmixq tkYxi Ašf® | DrcwÉ`j BZvjx| eZ@vfb mefkj me `vfb cñvi jvf
KtšQ| t`tni AvKvi AvKwZ tQvU| wWtgi AvKvi eo, Gt`i mv`v, ev`vgx, bxjvf, nj y |
Kvj RvZ AvtQ| Zte mv`v is-Gi GKK SdJ wewkó DcRvZ mePtq Rbucšj |

tiW AvBj`U tiW

ewYwR`K nVBweW mjoí
Rb` Avi. AvB. Avi Gi
wWg e`enri Kiv nq| Giv
Avgvt`i t`tk 150-200
wWg t`q|

GuU Avtgwi Kiv tkYxi Ašf®, fviX RvZ| GuU mst`qtc Avi. AvB. Avi bvtg cwi wPZ| t`tni
cvj K jvj wKš`tj tRi w`tki cvj K, Mjv Ges Wvbrv cvj K wKQy v| wWtgi is ev`vgx|
ewYwR`K nVBweW mjoí Rb` G gjmMi wWg e`enri Kiv nq| Giv Avgvt`i t`tk 150-200
wWg t`q|

nbD n`v`úkvqvi

Avtgwi Kvi nbDn`v`úkvqvi bvgK `vfb Gi DrcwÉ`j Gifc bvgKiY Kiv ntqtQ| A`bKuv
tMjvKwZ, eo AvKviti Ges nuj Kv nj y eY®wekó G gjmM cñvZt gysm cñvbKvix| Gi
Ab`vb` wekó`i gta` AvtQ nj y eY® cv Ges GKK SdJ| wWtgi is ev`vgx| eZ@vfb
nVBweW gjmM `Zwi KtšZ Gt`i e`enri Kiv nq|

dBI ng

GuU fga`mvmixq tkYxi Ašf® RvZ| DrcwÉ`j wgti | Gt`i Mjv i w`tki amj Ges mg`l
kixti mv`vKvjv istqi wgtY| Giv Lg PÁj | PjvK Ges t`kx gjmMi gZ Gt`i Qvor
Ae`vq cvj b Kiv hvq| Gt`i Kvtbi j wZ mv`v| gv`vi SdJ AvKviti tQvU, tetRvi Ges jvj |
Avgvt`i t`tk Giv eQti 150-200 wWg t`q|

nvtmi RvZ

cw_extZ mekaK nva
cvj b Kiv nq Pxb t`tk
Ges evsj vt`tki `vb
wZxq|

wetk;22 cKviti i nvtmi RvZ AvtQ| t`kx nva mn wet`kx RvtZi nva| Avgvt`i t`tk cvj b
Kiv nq| cw_extZ mekaK nva cvj b Kiv nq Pxb t`tk Ges evsj vt`tki `vb wZxq|
evsj vt`tki nva AvKviti tQvU, Kg wWg t`q Ges wWtgi AvKvi tQvU| t`kx RvtZi nvtmi
cwi Pq wbt`w` qv ntj v|

bšMkx nva

evsj vt`tki wntj tU | fvi tZi KvQvtó G nva cvl qv hvq | Gt`i Mjv | ekj mv`v Ges
kixti Ab`vb` Ask Kvtj v| cv | tVvtUi is nj y| wWtgi is nuj Kv bxj ev meRvf| eQti
Giv cšq 100wWg cvti |

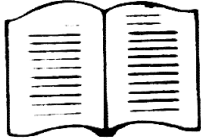
gvU nva

evsj vt`tki wntj U tRjvq G nva cvl qv hvq| nvtmi cvj K ami eY®| cvj tKi Dci gvtS
gvtS Kvtj v`M`vtK| tVvU | cvtqi is nj y A_er Kvtj v| wWtgi is mv`v|

mv`v nva

evsj vt`tki cšq mePB Gt`i G RvZ t`Lv hvq| Gt`i t`tni cvj K mv`v, tVvU | cv nj y,
AvKviti tQvU| wWtgi AvKvi tQvU| GQvovl Avgvt`i t`tk wefbae`wZ nva cvl qv hvq| Gt`i
wWg Drcv`tbi nri Kg| Giv tek Kó minòzL PÁj |

eZgvtb e`euZ i vniqbK mvti kZKiv 10 fiv Avgiv ci m`u` nZ tctq _vK| Avgvt`i
cPij Z Rjy vbi 20 fiv Avtm ci m`u` nZ| t`k cZ eQi 7 wgvj qY Ub tMvei Rjy vbi
vntmte e`euZ nq dtj t`ki tek eo AstKi UvKv GLvtZ miktq nq|



mvi gg®
wvfbvRvtZi Mi wvfbvRvtR e`euZ nq| `jai Rb` jvj vniqb, kvnxl qvj, _vcKvi, nj vob
vchvRqv, KvRi Rb` nniqv, vMvix, avb, _vcKv Ges `g I KvR Dftqi Rb` nniqv
I _vcKvi RvZ DEg| givtli Dtv-LthvM` RvZ nj gyov givl| QvMti RvZtK `g
Drcv`bKvix gvsm Drcv`bKvix I Pvgov Drcv`bKvix G vzb RvtZ fiv Kiv nqtqQ| e`vK
tevj evsjv`tk Kvjv QvMj bvtg cvvPZ| gvMv RvtZi gta` tvqvBU tj MnY,® tivW
AvBj`vU tivW, vb n`v`vqv, dvBl w Ges nvtai DbZ RvtZi gta` Lvk K`v`f, vRsvs,
BvUqv ivvi evsjv`tk jvj Z cvj Z n`Q| tgvU RvZxq Avtqi 9% Ges iBvb Avtqi
13% ci m`u` vve tmvti Ae`vb|



cıřVĚi gj`vqb 2.2

mıvk DĚti i cıřkqUK ıPy (✓) ıř b|

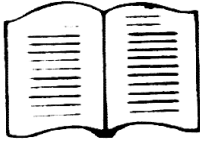
- 1| ıbtıř tKıv RıZıU`ȝ I KıR Dfřqi Rb`e`eüZ nq ?
 K. jıj ımÜx L. nj ıób ıclıRqıv M. nııı qıvı N. aıvıı
- 2| `ȝ Drcı`bKvıı tKıv Dbız QıMtj i RıZ ersj vř`tk t`Lı hıq ?
 K. bııeqıv L. G`ıstjıv M. UsMb N. hğlıcıvıı
- 3| ıı-UıBc tKıv RıřZi tfoıı AřMž ?
 K. KıMb L. tğıı tıvı M. I qııRııı N. ıııııı K
- 4| mı`ı ıstqi GKk Rıı tKıv RıřZi gııııı ?
 K. fııW AıBj`vÜ fııW L. ıbDııv`ıükıqıvı
 M. tııqııBU tj Mııııı N. dııBıı ıı
- 5| tKıv nııı me tPtq teıık ıııg t`q ?
 K. ııRıııı L. ııRııııı nıııı
 M. LııK K`ıřřř nıııı N. BııÜqıv ıııvııı
- 6| tğıı RıZıq Aıřq cıı m`ž` mııııııııı i Ae`ıv KZ ?
 K. 10% L. 9% M. 20% N. 24%

cw 2.3 ejsj vt`tki grm` m`ut` i cwi i PwZ I cwi msL`vb



G ciV tkfI Avci b

- ◆ ejsj vt`tki grm` m`ut` i Drm, tj vi eYv vi tZ cvi teb|
- ◆ gvtQi tkWYeb`vm Ki tZ cvi teb|
- ◆ ejsj vt`tki A_ %wZK , i zcy gvtQi Zwi j Kv c`Z Ki tZ cvi teb|
- ◆ ejsj vt`tki grm` m`ut` i cwi msL`vb ej tZ cvi teb|



grm` m`ut` i cwi i PwZ

grm` m`ut` i Drmmgr:

ejsj vt`tki grm` m`ut` i Pwi W Drm i tqtQ| G, tj v ntj v:

- 1| Af`šli xY gY Rj vkq
- 2| Af`šli xY ex Rj vkq
- 3| Avatj vbr cwi bi Rj vkq
- 4| mvgY K Rj vkq |

Af`šli xY gY Rj vkq

Af`šli xY g³ Rj vktqi gta` itqtQ b`x l Lwo AAj, nvi i, vej, ni Ges ciebfig| eZ@tb t`tk tgvU gY Rj vktqi cwi gvY 40,47,316 tn±i |

gY Gj vKvi m½ hY Rj vktqK Af`šli xY gY Rj vkq etj | Af`šli xY gY Rj vktqi gta` itqtQ b`x l Lwo AAj, nvi i, vej, ni Ges ciebfig| ciebfig el@Kvtj cwb tZ fti b`xi mft_ GKvKvi ntq hq Ges i Ktbr tgdmtg RigtZ cwi bZ nq Ges ZLb tmLvtb dmtj i Pvlver` Kiv nq| wvrfbæKvi tY Af`šli xY gY Rj vktqi gvtQi msL`v l Drcv`b μgvMZ Ktg hft`Q| eZ@tb t`tk tgvU gY Rj vktqi cwi gvY 40,47,316 tn±i |

Af`šli xY ex Rj vkq

th mKj Rj vkq b`x, nvi i ev vej i mft_ hY bq Gt`i tK Af`šli xY ex Rj vkq etj | Af`šli xY ex Rj vktqi gta` itqtQ cKz, w`w, ev i, BZ`w | eZ@tb t`tk tgvU ex Rj vktqi cwi gvY 1,52,378 tn±i |

Avatj vbr cwi bi Rj vkq

b`x l mgY i m½ g`j tK Avatj vbr cwi bi Rj vkq etj | Gme Gj vKv b`xi cwbewwZ cYKvi K l mgY i cwi bi cYKvi K vvi v c`vewšZ nq| Avatj vbr cwi bi Rj vkq th tKib Rj vktqi tPtq Awak Drcv`b flgZv m`zbe nq| Avgvt`i t`tk Avatj vbr cwi bi AAj mZv fiv t`tk K· ev Rvi chŠi e`Z| DcKj xq wPsw Lvgi Gj vKv ev Avatj vbr cwi bi Rj vktqi AvqZb 2,60,000 tn±i |

mvgY K Rj vkq

mvgY K Rj vktqi GKvŠ A_ %wZK Gj vKv 200 buUK`ij gvBj Ges gwtmvcib 85,153 eM@Ktj wgvUvi chŠi e`Z|

Avgvt`i t`tki `w fiv itqtQ etfvcwMi | GuU mvgY K grm` m`ut` i Drm| mvgY K Rj vktqi GKvŠ A_ %wZK Gj vKv 200 buUK`ij gvBj Ges gwtmvcib 85,153 eM@Ktj wgvUvi chŠi e`Z| mvgY K Rj vktq AwURbvj wdkwi l Uij wdkwi w`tq gvU ai v nq|

gvřQi cřřwZ

evsj vř`tki Af`řiıY
Rj vřtkř cřř 260 cřřwZi
ıgVv cıbi gvQ AvřQ/
GQıov Gme Rj vřtkř Avi l
12 cřřwZi ıeř`kx gvQ l
24 cřřwZi ıPřıo gvQ
AvřQ/

evsj vř`tki Af`řiıY Rj vřtkř cřř 260 cřřwZi ıgVv cıbi gvQ AvřQ/ GQıov Gme Rj vřtkř
Avi l 12 cřřwZi ıeř`kx gvQ l 24 cřřwZi ıPřıo gvQ AvřQ/ mıgř`K Gj vKıv iřtkřQ 475
cřřwZi gvQ Ges 36 cřřwZi ıPřıo gvQ/ gvřQi tkřııweb`ım ıewfbaı Kg nřZ cřři | `eÁııbK
`ıóřKıv nřZ řMıř er cııeri Abyıřı gvřQi tkřııweb`ım DEğ/ Aveıı cııřtkı Dci ıřıE
Křı Z_v ıgVv cıbi gvQ Ges řj vıv cıbi gvQ ııřmře ıPıřıZ Kıv řřtkř cřři |

ıgVv cıbi gvQ nřl o, evl o, cřřž, ıııN, b`x, Lıj , ıej BZ`ııřZ erı Křı | ř`řni Zıjıvıq
Gř`i ıWg avıY řřgZv teık | Gıv SvKı teřa Pj vřdiv Křı | Gř`i gv_vq řKıv AvBk řbB/
K`ıU ıdk e`Zıx Ab`me gvřQi ř`n gvSvıx l řQıU Avřřk řıwZ`ıřK |

řMıř Abyıřıx ıKQıııPZ ıgVv cıbi gvřQi bıřgi Zııj Kv ıbře`ıř` qv nřj v:

řMıř	gvřQi bıř
A`ıvıe`ıvıUıw (Anabantidae)	KB, Lıj mv
e`ııMıř (Bagridae)	ııR, AvBı, evNv AvBı, Zj -v AvBı, řMıř mv, řUııv, Křıř v eřřıx
P`ııbıw (Channidae)	MRıı, řkıj , UıKx, řZřj v UıKx
mıBıKıw (Cichlidae)	řZj ııcqv, bıBřj ııUKv
řKııı ıw (Cloridae)	gv_ı, AvıdKıv gv_ı
Křcıw (Clupeidae)	Bıj k, Mb_`ıııqv, Pııcř v
řKııeıUıw (Cobitidae)	teıZ er řeřgvQ er ıııbgıQ, ıZğ gvQ
ıııııııw (Cyprinidae)	iB, Nııbqv, Kııj evDK, bıvıı bı gřMıř, evUv er LııK, KřZj v, gııřkıj , KgbKıv, ııcııı, ıZZcııı, RııZ cııı, dřııı cııı, řgvj v, UıUřKbx, bııřKıx řPj v, dřřřPj v, cıZv řPj v, mı`v eřřıx, ııVv
KıPıw (Kuchidae)	Křř
řnřUřı vııbDıııUıw (Heteropnewstidae)	ıks er ııkııř
bıvıwıw (Nandidae)	řf`v er řgııb
břUvcıUıı ıw (Notopteridae)	dıj , ıPZj
cıvřMııııw (Pangasidae)	cıvřMıı
ıııj eBıw (Schilbeidae)	NıDııv, evZııı, KıRııj , evPı
ıııAvıbıw (Sciaenidae)	řcıvıv
ıııj ıııw (Siluridae)	řevııj , cıe`v, Kııb cıe`v
řUUřı řWıvıUıw (Tetraodontidae)	řUcv, cUKv, WıvıwKıv, evıa cıZıv, `ııııKıv

KvL.1 cĵ Dbaĵ ħ

eĵvcmiMi t_ĵK Avni YKZ.A_ĵwZK tĵĵĵ ĵ ĵcYĵj vbr cmbi cĵvb gvQ, ĵj v nt"Q evM`v ĵPšio, evMvZvi v ĵPšio, Pvk v ĵPšio, nvi br ĵPšio, Mj `v ĵPšio, KvUv gvQ, ĵj vbr tUsiv, tKvi vj ev tFUiK, j BU`v gvQ, i vĵv gvQ, tmbvj x evUv, mvgĵK cvĵim, j vL&v, cwi gvQ, tcvqv, j vj vĵcvqv, iĵcPv`v, dvBm`v, Bvj k I Uĵv|

Dcĵi evYĵ gvQ, ĵj v Avĵiv vbtRiv LvB Ges ĵKQyAsk vĵ`ĵk i Bvb Kĵi `eĵ`ĵk gĵĵ Avq Kwi |

grm` mĵuĵ` i cwi msL`vb

eĵj vĵ`ĵki grm` mĵuĵ` i cwi msL`vb vbtĵuĵ` qv ntĵj v t

1| Af`šĵĵ grm` mĵuĵ`

K.

ex Rĵĵq	Rĵĵĵi AvqZb (tn±i)
cĵĵ	1,46,880
evl i (gĵ b`x)	5,488
DcKj xq ĵPšio Lvĵvi Gj vKv	2,60,000

L.

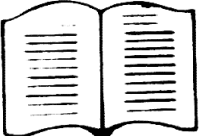
gĵ Rĵĵq	Rĵĵĵi AvqZb (tn±i)
b`x	10,31,563
vĵj	1,14,161
KvBvB nĵ	68,400
cĵeb fĵg	28,32,792

2| mvgĵK Rĵ mĵuĵ`

eĵvcmiMĵi i AvĀvj K Gj vKv	12 bĵĵK`vj gvBj
GKvš A_ĵwZK Gj vKv	20 bĵĵK`vj gvBj
DcKj xq mĵgĵi Lv	480 bĵĵK`vj gvBj
gnĵĵmĵcvb	85,153 bĵĵK`vj gvBj
DcKĵxq tcvĵ vi / GbĵKvRvi	8,73,000 bĵĵK`vj gvBj



Abkxj b (Activity): evsj vt`tki Af`šli xY ex Rjvkq, gġ Rjvkq Ges mvgvġK Rj m`úť`i grm` m`úť`i Zġbvġj-K ĩPĪ t`Lv|



mvi gg[®]
evsj vt`tki grm` m`úť`i PviĳU Dm ntj v - Af`šli xY gġ Rjvkq, Af`šli xY ex Rjvkq, Avatj vbi cmbi Rjvkq Ges mvgvġK Rjvkq| tMvĪ Abjvġti gvġQi tkiY meb`im DEġ| cmbi jeYv³Zv I AjeYv³Zvi Dci ĳfivĒ Kġi gvQġK ĳġVv cmbi gvQ I tjvbi cmbi gvQ G`ġkbtZ fVM Kiv hvq| tjvbi cmbi gvQB tenk i Bvb Kiv nq|



cvtVvEi gj`vqb 2.3

mivK DEti i cvtk,UK wPy (✓) w`b|

1| eivj vt`tki grm m`u`i i Dm KquU ?

- K. `BU
- L. PiuU
- M. cvBU
- N. wZbuU

2| eivj vt`tk KZ cRvzi wVv cmbi gvQ AvtQ ?

- K. 260
- L. 475
- M. 12
- N. 36

3| mivgK Rj vktqi GKvšA_ wZK Gj vKv KZ buUK`vj gvBj chšve`Z.?

- K. 400
- L. 200
- M. 500
- N. 1200

4| gv, i gvQ tKvb tMtI i Ašf, ?

- K. mvBuKW
- L. KšcW
- M. KpW
- N. tKwi W

5| j vBU`v gvQ tKvb Rj vktq evm Kti ?

- K. Af`šlixY ex Rj vktq
- M. Avav tj vbr cmbi Rj vktq
- L. mivgK Rj vktq
- N. Af`šlixY gš Rj vktq

6| tgvU gš Rj vktqi AvqZb KZ tn±i ?

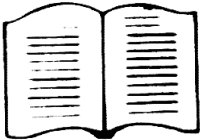
- K. 10,31,563
- M. 40,46,916,
- L. 28,32,792
- N. 40,47,316

cw 2.4 evsj v`k RvZxq A_ŠmZtZ grm` m`ut` i Ae`vb



G cvV tkfI Avciwb

- ◆ evsj v`k Drcv` Z grm` m`ut` i weei Y w` tZ cvi`teb|
- ◆ evsj v`k nŕtZ thme grm` I grm`RvZ cY` wef` tk i Bmb Kiv nq tm, tjvi bvg ej tZ cvi`teb|
- ◆ evsj v`k i A_ŠmZtZ grm` m`ut` i Ae`vb eYŠv Ki tZ cvi`teb|



ŒgvtQ-fvtZ evšij xŒ K_wU t_tK gvtQi , iž; h_v_B Dcj wä Kiv hvq| evsj v`k i RvZxq A_ŠmZK Dbqeb, RbšMwŕi Kgms`vb Ges `ef`wkK gŕš ARŠbi tŕtŕ grm` Pvl wef`kI fvgKv cvj b Ki tQ| grm` m`ut` Gf`tki Ab`Zg cŒKwZK m`ut` | b`xgvZK.GB evsj v`k grm` m`ut` i GK Adžšf vŕŕvi |

Avgt` i t`tk cŕYR
 AvgfI i cŕvb Dm nŕ`Q
 gvQ| cŕYR AvgfI i
 kZKiv 80 fŕM Avtm gvQ
 t_tK| gvQ Mto cŒq
 kZKiv 20 fŕM AvgfI
 AvtQ|

Avgt` i t`tk cŕYR AvgfI i cŕvb Dm nŕ`Q gvQ| Lv` wntmte Gi , iž; AZ`waK| kixŕi Rb` G,wV,wm Lv` cŕY AZ`šf cŒqvRbxq| gvQ ŒGŒ I ŒwŕŒ Lv` cŕY mgx| gvtQi Pvgovq cŒž cwi gvtY Lv` cŕY ŒwŕŒ i tqtQ| D`P i 3PvcwewkŒ tŕiMxt` i Rb` ŕŕwZKvi K tKvtj tŕij gvQ tbB ej tj B Ptj | evsj v`k cŕYR AvgfI i kZKiv 80 fŕM Avtm gvQ t_tK| gvQ Mto cŒq kZKiv 20 fŕM AvgfI AvtQ|

evsj v`k eZŠvteb cŒq 12 j ŕŕ tgvUK Ub grm` Drcv` b nq| Gi gŕa` 9 j ŕŕ tgvUK Ub Af`šŕixY Rjvkq t_tK ewk 3 j ŕŕ mvgŕYK GjvKv t_tK| Gf`tki cŒq 12 j ŕŕ tjvK mveŕŕwbKfŕte Ges GK tKwU tjvK LŒKvjxbfŕte gvQ Pvl, gvQ aiv, gvQ e`emv I Rvj eŒtbi gva`tg RweKv ŕbeŕŕ Kŕi _v`K| GQvov gvQ msi ŕŕY I cŒŕqvRvZKiY, mieivn I tePŕtKbri KvŕRI AŕbK tjvK ŕbtqwmRZ AvtQ A_ŕ grm` m`z` gvbŕi i Kgms`v`tbi tŕtŕ , iž;cY`fvgKv cvj b Kŕi AvmtQ|

evsj v`k nŕZ thme grm` I grm`RvZ cY` wef` tk i Bmb nq tm, tjvi ntjv wngwqZ wPswŕ, wngwqZ gvQ, iUwK, j eYv` gvQ, nŕvŕtŕi cvLbv, tcvUKv, K`Qc ev KwmQg Ges KvKŕov| 1994-95 mŕb grm` m`ut` i Bmb Kŕi evsj v`k 1307 tKwU UvKv Avq Kŕi | G mgq grm` m`ut` i Ae`vb wQj wR.wV.wc.tZ 4% Ges i Bmb Avtq 12% hv Ab`vb` eŒtŕi Zjybvq tenk|

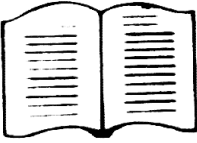
grm` m`ut` i Ae`vb ŕbt`v` qv ntj v:

- grm` Drcv` b : 1.187 wgvj qb tgvUK Ub
- Kgms`vb t
 - mveŕŕwYK : 1.2 wgvj qb e`w`3
 - LŒKvjxb : 10 wgvj qb e`w`3
- `ef`wkK gŕš ARŠ (1994-95): 1307 tKwU UvKv
- wR.wV.wc.-tZ Ae`vb : 4%
- i Bmb Avtq Ae`vb : 12%
- cŕYR AvgfI mieivn : 80%

gvQ i`ayLvevi wntmte bq, eis Gf` i eR`h_v nŕo, cvLbv, AvBk, bwo-fŕŕo BZ`w` cwi Z`3 Ask w`tq wdkwgvj I `Re mvi `Zwi Kiv hvq| Gme wdkwgvj nŕw-gŕŕMi Lvevi wntmte e`eÜZ nq|



Ablyj b (Activity): evsj vt`tki RvZiq A_0mZtZ grm" m=ut`i Ae`vb m=ut`K©GKuU
msv`fjB cEÜ wj Ly (Aby`200 kã)|



mvi gg©

evsj vt`tki 10% tj vK grm" m=ut`i mvt_ cZ`fj ev c`iv`fjvte RmZ| grm" m=ut` i Bmb
Kfi evsj vt`k 1994-95 mtb 1307 tKvU UvKv Avq Kfi | Gmgfq mRmW.nc. tZ grm"
m=ut`i Ae`vb wj 4% Ges i Bmb Avq 12%|



cvtVĚi gj`vqb 2.4

mĭVK DĚti i cvtk`UK ĩPý (✓) ĩ`b|

1| cĕYR AvıgıI i cĕvb Dm Kx ?

- K. gvsm
- L. gvQ
- M. ĩVg
- N. `g

2| gvıQi Pıgovq tKvb Lv`cĕY i tıqıQ?

- K. Lv`cĕY G I ĩV
- L. Lv`cĕY ĩV
- M. Lv`cĕY ĩm
- N. Lv`cĕY G

3| Gı`tk mve`ıYK fıte grm` mĕzı` i mıı_ RıoZ tı vtKi msL`v KZ?

- K. 12 j ıı
- L. 50 j ıı
- M. 75 j ıı
- N. 1 tKıı

4| i Bıvb Avıq grm` mĕzı` i Ae`vb KZ ?

- K. 4%
- L. 8%
- M. 12%
- N. 15%

5| ĩdmııj Kx ĩ`ıq `Zıı nq ?

- K. ĩPııo gvQ ĩ`ıq
- L. Kvkııı ĩ`ıq
- M. tcvUKv ĩ`ıq
- N. gvıQi AvBk I bııo fııo ĩ`ıq|

6| evsj vt`tk grm` Drcv`b KZ ĩıııı qb tııUK Ub ?

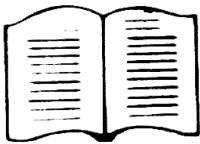
- K. 1.187
- L. 2.871
- M. 3.538
- N. 2.120

cw 2.5 ejsj v`tki ebR m`ut`i , i`y; cwi`tekMZ I A_`%wZK newfbæbR e`f`ji cwi`PvZ I cwi`msL`vb



G cvV tk`l Av`cub

- ◆ ejsj v`tki ebR m`ut`i , i`y; eY`v Ki`Z cvi`teb|
- ◆ cwi`te`tki Dci ebR m`ut`i c`iZ`u`q`v eY`v Ki`Z cvi`teb|
- ◆ ebr`qb e`w`x`i i`f`c`i`L`v c`i`q`b Ki`Z cvi`teb|
- ◆ Kul`R ebr`qb (Agroforestry) -Gi m`s`z`v I newfbæ`v`v eY`v Ki`Z cvi`teb|
- ◆ newfbæ`k`v`R e`e`u`Z ebR e`f`i`m`g`n`i bvg e`j`t`Z cvi`teb|
- ◆ ebR e`f`i`j`i Ae`vb g`j`v`q`b Ki`Z cvi`teb|



ejsj v`tki ebR m`ut`i Rv`Z`x`q A_`B`m`Z`i`Z GK , i`y`c`y`Ae`vb i`v`L`i`Q| c`i`u`g`K`f`i`te ebR m`ut`i n`t`Z Av`g`i`v K`v, L`v, R`j`v`b`x K`v I u`k`i`i K`v`P`v`g`j` t`c`t`q `u`m`K| eb newfbæ`b`c`i`y`x I c`v`i`L`i Av`k`q` t`K`v`q` G`Q`v`o`v M`O`c`y`j`v S`o c`i`Z`i`v`a K`ti, e`v`Z`v`t`m`i `q`i`v`Z`K`v`i`K D`c`v`v`b , t`j`v`t`K` t`k`v`l`b K`ti g`v`b`y` I c`i` c`v`i`L`i R`b` `w`b`g`f` e`v`q`y`m`i`e`i`v`n K`ti| cwi`te`tki f`v`i`m`v`g` `i`q`i`v K`i`v D`v`m`f` `i` GK , i`y`c`y`K`v`R| eb cwi`te`k`Z`t`S`j` GK`u` AZ`S`i , i`y`c`y`D`c`v`v`b, h`v` H G`j`v`K`v`q `R`e I A`%`R`e D`c`v`v`t`b`i g`v`t`S` m`g`Z`v`i` `q`i`v` K`ti|

t`K`v`b t`tki m`y`g Kul. I u`k`i`v`q`b`m`n cwi`te`tki f`v`i`m`v`g` `i`q`i`v`i R`b` `t`m` t`tki `j` f`v`t`M`i K`g`c`f`q` 25% R`i`g` e`b` `t`h`i`v`v` Av`Q`v`i` Z `v`K`v` e`v`A`b`x`q`| e`f`b`i` m`v`t`_ cwi`te`tki m`a`u`K`AZ`S`i `w`b`v`e`o`| t`K`b`b`v` A`v`e`n`v`l` q`v`i` newfbæ`D`c`v`v`b` t`h`g`b` Z`v`c`g`v`i`v, Av`Z`v, g`v`u` I c`v`i`b`i` `e`i`k`o`v`e`j`x`i D`c`i` e`f`b`i` c`f`v`e` A`c`v`i`m`x`g`| ejsj v`tki m`i`w`K` e`b`f`v`g`i` cwi`m`S`L`vb` e`j`v` K`o`m`v`a`| Z`t`e` e`b`m`a`u` `t`h` a`y`m` n`t`Q` Z`v` m`n`t`R`B` t`P`v`t`L` c`t`o`| K`v`M`t`R` K`j`t`g` e`b`m`a`u` `D`R`v`o` n`e`v`i` cwi`g`v`Y` K`g` n`t`j` I e`v`t`e` Z`v` A`t`b`K` t`e`w`k`| `f`a`x`b`Z`v` h`y` P`j`v`K`v`j`x`b` m`g`t`q` X`v`K`v, P`A`E`M`i`g` I U`v`z`v`B`t`j`i` e`u` e`b`-m`a`u` `a`y`m` K`i`v` n`q`| h`t`x`v`E`i` ejsj v`tk` e`i`n`i`v`M`Z` I D`c`R`v`i`v` c`v`n`v`o` I `u`j`v`i` R`z`j` c`v`i` `v`i` K`ti` P`v`t`l`i` R`i`g` %Z`v`i` K`ti`| e`Z`g`v`t`b` t`m`m`e` R`v`q`M`v` a`v`b, A`v`b`v`i`m, c`v`b, m`z`v`v`i, Av`v, i`i`b` I newfbæ`m`i`a` P`v`t`l`i` R`b` `e`e`u`Z` n`t`Q`| ejsj v`tk` e`Z`g`v`t`b` t`g`v`U` e`b`f`v`g` 18% G`e`s` c`k`Z. e`b`f`v`g` 12% G`i` `w`b`t`P` e`t`j` A`b`y`g`Z` n`t`Q`| e`b`-m`a`u` `I` cwi`te`k` a`y`m` K`i`v`i` d`t`j` ejsj v`tk` e`b`v, L`i`v, R`t`j`v`Q`y`m`n` b`v`b`v` a`i`t`b`i` c`i`k`w`Z`K` w`e`c`h`q` t`L`v` h`v`t`Q`| A`c`v`i`K`v`i` Z`f`v`t`e` M`O`c`y`j`v` K`v`U`v`i` K`v`i`t`Y` R`i`g`i` D`e`P`Z`v` k`v`³ I g`v`u`i` Av`Z`v` n`v`m` c`i`t`Q`| Z`v`c`g`v`i`v, e`w`o`c`v`Z` I e`v`q`g`U`j`x`q`

ejsj v`tk` e`Z`g`v`t`b` t`g`v`U` e`b`f`v`g` 18% G`e`s` c`k`Z. e`b`f`v`g` 12% G`i` b`v`t`P` e`t`j` A`b`y`g`Z` n`t`Q`|

t`K`v`b t`tki m`y`g Kul. I u`k`i`v`q`b`m`n cwi`te`tki f`v`i`m`v`g` `i`q`i`v`i R`b` `t`m` t`tki `j` f`v`t`M`i K`g`c`f`q` 25% R`i`g` e`b` `t`h`i`v`v` Av`Q`v`i` Z `v`K`v` e`v`A`b`x`q`| e`f`b`i` m`v`t`_ cwi`te`tki m`a`u`K`AZ`S`i `w`b`v`e`o`| t`K`b`b`v` A`v`e`n`v`l` q`v`i` newfbæ`D`c`v`v`b` t`h`g`b` Z`v`c`g`v`i`v, Av`Z`v, g`v`u` I c`v`i`b`i` `e`i`k`o`v`e`j`x`i D`c`i` e`f`b`i` c`f`v`e` A`c`v`i`m`x`g`| ejsj v`tki m`i`w`K` e`b`f`v`g`i` cwi`m`S`L`vb` e`j`v` K`o`m`v`a`| Z`t`e` e`b`m`a`u` `t`h` a`y`m` n`t`Q` Z`v` m`n`t`R`B` t`P`v`t`L` c`t`o`| K`v`M`t`R` K`j`t`g` e`b`m`a`u` `D`R`v`o` n`e`v`i` cwi`g`v`Y` K`g` n`t`j` I e`v`t`e` Z`v` A`t`b`K` t`e`w`k`| `f`a`x`b`Z`v` h`y` P`j`v`K`v`j`x`b` m`g`t`q` X`v`K`v, P`A`E`M`i`g` I U`v`z`v`B`t`j`i` e`u` e`b`-m`a`u` `a`y`m` K`i`v` n`q`| h`t`x`v`E`i` ejsj v`tk` e`i`n`i`v`M`Z` I D`c`R`v`i`v` c`v`n`v`o` I `u`j`v`i` R`z`j` c`v`i` `v`i` K`ti` P`v`t`l`i` R`i`g` %Z`v`i` K`ti`| e`Z`g`v`t`b` t`m`m`e` R`v`q`M`v` a`v`b, A`v`b`v`i`m, c`v`b, m`z`v`v`i, Av`v, i`i`b` I newfbæ`m`i`a` P`v`t`l`i` R`b` `e`e`u`Z` n`t`Q`| ejsj v`tk` e`Z`g`v`t`b` t`g`v`U` e`b`f`v`g` 18% G`e`s` c`k`Z. e`b`f`v`g` 12% G`i` `w`b`t`P` e`t`j` A`b`y`g`Z` n`t`Q`| e`b`-m`a`u` `I` cwi`te`k` a`y`m` K`i`v`i` d`t`j` ejsj v`tk` e`b`v, L`i`v, R`t`j`v`Q`y`m`n` b`v`b`v` a`i`t`b`i` c`i`k`w`Z`K` w`e`c`h`q` t`L`v` h`v`t`Q`| A`c`v`i`K`v`i` Z`f`v`t`e` M`O`c`y`j`v` K`v`U`v`i` K`v`i`t`Y` R`i`g`i` D`e`P`Z`v` k`v`³ I g`v`u`i` Av`Z`v` n`v`m` c`i`t`Q`| Z`v`c`g`v`i`v, e`w`o`c`v`Z` I e`v`q`g`U`j`x`q` R`j`x`q` e`v`t`z`i` Z`v`i`Z`g` N`U`v`q` m`e`P` Kul. D`r`c`v`b` e`v`n`Z` n`t`Q`| ejsj v`tki D`E`i`v`A`t`j` B`v`Z`g`t`a` `g`i`k`i`Y`i`i`y`n`t`q`t`Q` G`e`s` `v`b`v`b` G`i` `w`e` `u`Z` N`U`t`Q`| m`e`R` M`O`c`y`j`v` I b`v`b`v`e`a` R`x`e`R`S` `A`Z` `w`a`K` n`v`t`i` a`y`m` K`i`v`i` d`t`j` G` A`A`t`j` c`i`k`w`Z`K` I `R`w`e`K` cwi`te`k` `v`i`y`f`v`t`e` e`v`n`Z` n`t`Q`| d`t`j` G`t` `t`k` `i`a`y`c`i`k`w`Z`K` `t`h`M`B` b`q` b`v`b`v` a`i`t`b`i` b`Z`b` b`Z`b` t`i`v`t`M`i` c`i`k`v`e`l` N`U`t`Q`|

G`K`v`t`K` `y` R`b`m`S`L`v` e`w`x, A`c`i`v`t`K` e`v`c`K` e`b`v`A`j` n`v`m` G`e`s` t`m`B` m`v`t`_ newfbæ`c`i`y`R` I D`v`m`³ c`R`v`i`Z`i` w`e`j`y`t`Z` ejsj v`tki cwi`te`k`MZ` f`v`i`m`v`g` `Av`R` G`K` g`v`i`v`Z`K` w`e`c`h`q`i` m`a`u`b`| e`b` m`v`o` K`i`v`i` g`Z` c`h`k`v` R`v`q`M`v` c`v`l`q`v` g`j`v`K`j` | B`Q`v` K`i`t`j` I d`m`j` D`r`c`v`b` e`v` `t`i`t`L` t`m`L`v`t`b` e`b`v`A`j` m`v`o` K`i`v` c`i`q` A`m`e`e` h`v` I M`O`c`y`j`v`i` Ae`vb` A`v`K`v`i` K`i`v`i` t`K`v` D`c`i`q` t`b`B`| Z`v`B` e`f`i` t`i`v`c`t`b`i` R`b` `i`K`v`i` m`i`K`v`t`i`i` m`i`w`K` b`v`i`Z` I K`g`f`K`S`k`j` G`e`s` w`e`A`v`b`m`a`u`Z` K`g`m`P` M`h`b`| Kul`R` ebr`qb` (Agroforestry) G`i` g`v`a`t`g` G` m`g`m`v` n`t`Z` D`E`i`Y` m`e`e` G`e`s` G`K`v`R`

AwfambK A`Kul.R
ebvqb ntjv Kul.i
civkvcnk ev Kul.i minPth`
ebvqb Mto tZvj v|

Buzgta`B Gt`tk iinyntqtQ| AwfambK A`Kul.R ebvqb ntjv Kul.i civkvcnk ev Kul.i minPth`ebvqb Mto tZvj v| GtK wZb avivq fVM Kiv thtZ cvti -

1. KulR ebvqb aviv :

- K. Kvôj Dw`i mvt_ dmtj i Pvl
- L. et`ji mmi i mvt_ A_ev et`ji bxp dmtj i Pvl
- M. emZevUx`evMvb

2. ebvqb PviY aviv t

- K. eü elRme Dw`i gvtS ci` cvj b
- L. Kvôj Dw`i mvt_ PviY D`vb
- M. Kvôj Dw`i mvt_ gÿ gjvMi Pvl

3. KulR ebvqY PviY aviv t

- K. GKmvt_ eü elRme Kvôj Dw`i, ci` Ges dmtj i Pvl
- L. emZ evUx`evMvb

th me`vb KulR ebvqb Kiv thtZ cvti tm`vb, tjvntjv t

- K. cuZZ fvg I enij gq bxpZl DlxGj vKv
- L. iv`l, tijc_ I evtai`gavi
- M. b`xi Zxi I cÿz`cvo
- N. me`nnavi tYi e`envi thvM` vb h_v nvU, evRvi BZ`w
- O. Awdm, Kj Kvi Lvbv, `ÿ, Ktj R I Dcimbvj q cÿY
- P. emZ emoi Awv`bv
- Q. gvV dmtj i t`jZ



Ablyj b (Activity): KulR ebvqtb i wefbaavi D`j lceR ersj vt`k Gi` iÿj I m`tebv m`utK`Avcbvi gZvgZ w`b|

cwi`tekMZ I A`wZK wefbaet`ji cwi`PvZ

cwi`te`ki Dbq`b Ges A`wZK fvt`e jvfevb nl qvi Rb` et`ji Ae`vb Acwi`mxg| Nti i Lw`l, Avmeve c`l, tbSKv, Mi`y Mvox, tLj bv, wkt`i i KivPvgj, Ryj wvb Ges gvU`tZ`Re c`v`thvMvb t`qv BZ`w` eümea Kv`R et`ji e`envi I Ztc`Z fvt`e RwoZ| ZvQvov wKQyMvQyMvQ is Drcv`b, wKQyMvQ JIa, AvVv I iRb`Zwi`tZ Ges ivevi MvQ ivevi Drcv`tb e`eüZ nq|

cwi`tek I cwi`cwk`RZvi Dci wfvE` Kti ersj vt`k i wefbaeA`tj wefbaeait`bi eb m`vó ntqtQ| G`tjv ntjv civvox eb, g`vbtM`f eb Ges kij eb| Gme ebvA`tj thme Dw`i R`tb` tm m`tU` wbt`vAvtj vPbv Kiv ntjv|

civvox eb

M`gU`j xq GB wPimeR I Avav wPimeR eb c`vYZt MR`b, wmvFU I Rvij, BZ`w` RvZxq et`ji mgst`q MwZ| G eb P`EMvg I cveZ` P`EMg tRjvq Aew`Z| GLvbKvi et`ji gta` tm`b, Mvgvi, Rvij, wZivR, Pvg, KoB, tjvov KvV, MR`b, t`j m`y, eqjvg, wUw`j, etniv, QwZg, Kvgt`e, U`wUqv, nvi`MvRv, evRis, wmvFU, iZv, Ww`j, D`j, Kzgov, ew`l, Lvc`FZ, AR`b, P`uK, civbmvR, evUbv, gqbv, wblj, f`w, Kzsg, wns`wi, eyjov, XvKIqv, tnjv,

KvL.1 c j n Dbq b ˘z

gij wMwi , wPKi w m , agPv , ebmg , i t 3 vb , Kvj ˘ v , tQj t d v B , tKvg , KvBbRj , evnij , Kwners ,
WwKig , ex i t d j v BZ ˘ w ˘ D t j -L t h v M ˘ | G Qvov Gme A A ˘ t j c P ˘ z c w i g r t Y evk l R t b ˘ |

g ˘ v b t M ˘ f eb

m ˘ y i x , t M I q v c f w Z g ˘ v b t M ˘ f R v Z x q D w ˘ m c m g ˘ x G e b v A ˘ j L j b v , c U q v L v j x , e w i k v j ,
t b v q v L v j x I P A ˘ M ˘ g m g ˘ y Z U G j v K v q w e ˘ Z | G L v b K v i c ˘ a v b e ˘ j n t j v m ˘ y i x , t M I q v , t M v i v b ,
t K I i v , f v i v , c i i , K ˘ v s K v i v , t e t q b , M i v b , ˘ y v j , t M j c v Z v B Z ˘ w ˘ |

k v j eb

k v j e v M R v i x e ˘ j G e s A b ˘ v b ˘ w P i m e ˘ R I c ˘ I c Z b k x j e ˘ j m g s ˘ t q m ˘ eb c ˘ a v b Z t M v R x c j ,
U v ˘ v B j , g q g b w m s n t R j v q G e s w e ˘ j B f i ˘ t e Q o v t b v i s c j I w b v R c j t R j v q w e i v R g i b | K v V
D r c v ˘ K M v Q k v j , K o B , t m v b j y m k i , L t q i , e ˘ n i v , n w i Z K x , Q w g , K v V j , R v g , R v g i j ,
e v e j , t e j , g u q v , K ˘ g , w k g j , A v g , w b g , t Z Z ˘ , B Z ˘ w ˘ G L v t b f v j R t b ˘ | A ˘ w Z K f i ˘ t e
g j ˘ e v b t K v b M v Q K x K v R e ˘ e u Z n q Z v i w K Q y ˘ v n i Y w b t ˘ e ˘ I q v n t j v :

K w I R j w b D r c v ˘ K e ˘ j

A R ˘ , A t k v K , w b g , A v g , A v g j v , A v g i v , B i c j B i c j , B D K ˘ w j c U m , K ˘ t e j , K o B , K ˘ g ,
K b K P r a v , K c ˘ , K v W P i c v , K v g i v ˘ v , K v V j , K v A ˘ Y , K K ˘ z w P Z v , K ˘ e ˘ K ˘ z , M R ˘ , M v e , M v g v i ,
t M I q v , t M j g n i , P r a v , P v j Z v , Q w Z g , R v g , R v i j , w R I j , t W D q v , Z v j , t Z Z ˘ , w b g , w b w m ˘ v ,
w c Z i v R , w c U w j , t c q i v , e U , e i ˘ j , e ˘ n i v , e v e j , e v k , t e j , g v ˘ v i , t g n w M b , i A ˘ b , w i V v , w j P z
k v j , w k g j , w k i , w k w i k , k ˘ v l o v , m g v w i , m ˘ y i x , t m ˘ b , n w i Z K x , w n R j B Z ˘ w ˘ |

w e v f b a n k i I A b ˘ v b ˘ K v t h ˘ e ˘ u z M v Q

- erovNi t t m ˘ b , K o B , R v i j , m ˘ y i x , M v g v i , M R ˘ , P r c j v k , e B j v m ,
t m v b j y c m j , w k w i k , A v g , R v g , K v V j , w k i , Z v j B Z ˘ w ˘ |
- t V j v I M i a i M v o x t e v e j , w k i , m ˘ y i x , M R ˘ , w c Z i v R , k v j , R v g , K ˘ z , R v i j ,
L t q i , b v t M k j , e ˘ n i v , n w i Z K x , K o B , t ˘ e ˘ v i y e v k , B Z ˘ w ˘ |
- t b ˘ K v t t m ˘ b , A v g , R v i j , t Z j m j , M v g v i , k v j , e v e j , K o B , w k i ,
L t q i , P r a ˘ v , B Z ˘ w ˘ |
- K v L . h ˘ s ˘ c w Z t e v e j , R v g , w k i , K o B , K ˘ z , M v e , t Z Z ˘ , A v g , t j v n v K v V ,
K ˘ z , k v j , R v i j , B Z ˘ w ˘ |
- c ˘ w k s e v t Q w Z g , w k g j , P r c j v k , A v g o v , A v g , Z ˘ b , P r a ˘ v , w w f U , i ˘ b ,
g q b v , t m j t K v B , e v k , B Z ˘ w ˘ |
- w b D R i c ˘ U t t M I q v , e v k , b j L v M o v , B Z ˘ w ˘ |
- g ˘ v P e t w k g j , Q w Z g , w c U j x , b w i t K j , B Z ˘ w ˘ |
- h ˘ s ˘ ˘ x i n v Z j , e v U t w k i , e v e j , t m ˘ b , m ˘ y i x , M v g v i , K j , B Z ˘ w ˘ |
- e v ˘ h ˘ s ˘ t t m ˘ b , Z ˘ b , M v g v i , w k i , w k w i k , B Z ˘ w ˘ |
- t c w ˘ j t f Z g , Z ˘ b , w b g , w w f U , B Z ˘ w ˘ |
- Q v Z v i e v U , Q v o I w e w e a
- K v t i w k i t w k i , K ˘ z , Z v j , b w i t K j , t e Z , e v k , t L R j , w k g j , g b v M w i ,
M v g v i , K v A ˘ b , f Z g , t e j , A v g , w M b w i , K ˘ z U k j , B Z ˘ w ˘ |

i s D r c v ˘ b K v i x M v Q

i s I U ˘ w b b D r c v ˘ b K v i x M v t Q i g ˘ t a ˘ j U K b , L t q i , b x j , t e v K K i b , R v d i v b , K ˘ z g d ˘ z , e K g ,
w w f , m g v w i , M v e , A v g j w k , e K ˘ z , e ˘ n i v , n i Z K x B Z ˘ w ˘ D t j -L t h v M ˘ |

ievi, Avv I iRb Drcv bKvixMq

ievi, mtd`v, e`j U e`j, I qv- cvg, Kj v`qv I qv- cvg, Mvg te`vMgb, evej v, A`vKvmmq, Kwdj v, BZ`w` |

Jlva Mq-Mqiv

eimK, Kij tgn, Avcv½, nvo`Rvov, Kwdj v, Avg, Avgov, AvZv, kvi dv, QmZg, K`P, `cMÜ, tKvmmj v, AvK`, Abš`j, etk, tmvov, Mj Mj, Pij gMiv, mkgj, tevrmi, LicvZ, eKdž, Rq`š, K`R, Rj KigPv, mki, gv`vi, cvk, A`kvK, tZž, tevKkv, eüi j mV, Kv`Ab, eiY, e`niv, nvi ZKx, AR, Pj, Pij Zv, Mve, t`fi Üv, Avgj mK, K`ž mPZv, tZRcvZv, mRj, Rvij, mbg, eU, tMj vRvg, Kvgiv½v, Zvj, bvi tKj, mšvi, ij Pz eKž, tm`b, Mvgv | G Qvovl `j vRvZiq A`bK MvQ Jlva MvQi`fc e`eüZ nq |

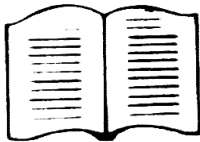
e`bi Ae`b

1992-93 A`eQti eb n`Z 81.22 j q NYdž KvV, 66.63 j q NYdž Rjj mbKvV, 67 nRvi tgvUK Ub tMj cvZv, 11.92 tKvU etk, 1.82 j q tgvUK Ub gayGes 36 nRvi tgvUK Ub tgv cvl qv hvq | eb n`Z c`B `e`v xi LvZqv mbt`qv n`j v |

`e`v xi bvg	1990-91	1991-92	1992-93
KvV (0000 NYdž)	8419	6600	8122
Rjj mb KvV (0000 NYdž)	38241	13000	6663
tMj cvZv (0000 tg. Ub)	72	72	67
etk (0000 bvi`fi)	84240	80000	119206
tgv (tg. Ub)	-	44	36
gay(0000 tg. Ub)	-	-	182

t`tki tgvU Af`šixY Drcv`b (GDP) -Gi kZKiv c`q c`B fivM eb Gj vKv n`Z Avtm etj AbvgZ | t`tki tgvU mki kigtKi c`q kZKiv 25 fivM eb mki mbtqmrZ |

t`tki tgvU Af`šixY Drcv`b (GDP) -Gi kZKiv c`q c`B fivM eb Gj vKv n`Z Avtm etj AbvgZ | t`tki tgvU mki kigtKi c`q kZKiv 25 fivM eb mki mbtqmrZ |



mvi gg®
 eb cvi tekZšj GKvU `ižcY`Drcv`vb | ebR m`u` evsj v`tki RvZiq A`mZtZ me`kl Ae`vb ivL`Q | KvL.R ebrq`bi gva`tg ebrq b m`o Kiv m`e | N`ii Lvj, AimevecĪ, Rjj mb, tMvLv, JIa, tšKv, tVj vMvov, KvMR, gv`Pev, KvL.hšcvmZ, ev`hšj BZ`w` `Zvi Ki`Z ebR m`u` i c`qvRb | t`tki tgvU Af`šixY Drcv`b i 5% eb t`k Avtm |



civVĒi gj'vqb 2.5

mivK DĒti i civk, UK wPy (✓) w b|

- 1| evsj v`tk cKZ.ebfugi civi gvY KZ ?
 K. 20 fivM L. 18 fivM M. 12 fivMi bxtP N. 25 fivM
- 2| Acvi Kur Zfvte MvQcvj v KvUvi dtj eti>`AAĀtj Kx civi j wTz nĀ"Q ?
 K. RxeRŠ'gri v hvĀ"Q L. Rigi DePZv nim civĀ"Q
 M. giĶiY i i ynĀqĀ"Q N. cPž epócvZ nĀ"Q
- 3| KvL R ebvqb Pvi Y aviv ej tZ Avgiv Kx evs ?
 K. Kvôj DivĀĀ` i mvĀ_ dmtj i Pvl
 L. GKB mvĀ_ eüel Rme Kvôj DivĀĀĀ, ci I dmtj i Pvl
 M. eü el Rme Kvôj DivĀĀ` i mvĀ_ ci cij b
 N. Kvôj DivĀĀ` i mvĀ_ gŷ gjvMi Pvl |
- 4| wvDRwĀĒ ĀZixĀZ tKvb MvQ e`eüZ nq ?
 K. tMl qv L. wki M. tm_b N. wbg
- 5| t`tki tgvU Af`ŠixY Drcv`tbi KZ fivM eb nĀZ AvĀm ?
 K. cĀq 10 fivM L. cĀq 5 fivM M. cĀq 7 fivM N. cĀq 12 fivM



Povšl gj`iqb

msv`B I iPbigj-K ckae

- 1| evsj v`tki vBR`nevfbaeci cvLi big vj Lj|
- 2| `enkó`mn tKvb RvZi gjm tKvb AĀtj cvl qv hvq Zvi weei Y w`b|
- 3| evsj v`tki nevfbaeci cvLi cwi msL`vb vj Lj|
- 4| D`vni Ymn nevfbaDbz RvZi Mi yGes QvMtj i RvZi big vj Lj|
- 5| kvxl qvj I j vj wUx RvZi Mi y eYv w`b |
- 6| e`vK teZj RvZi QvMtj i eYv w`b|
- 7| tnvqBU tj MnY`Avi AvB Avi I dvBl ug gjm m`fÜ mst`fjc vj Lj|
- 8| LwK K`v`f` nvtmi RvZi `enkó` Avtj vPbv Kij|
- 9| RvZxq A_ÖmZtZ ci cvLi Ae`vb Avtj vPbv Kij |
- 10| mvgv`K Rj vkq mst`fjc eYv Kij |
- 11| tj vbv cvbi gvQ I ugVv cvbi gvQ ej tZ Kx e`Sb ?
- 12| Af`šlxY g` Rj vkq ej tZ Kx e`Sb ?
- 13| ugVv cvbtZ evm Kti Ggb 5wU gvQti tMtĀi big mn bvg vj Lj|
- 14| iBvb thvM` grm` m`út` i weei Y w`b |
- 15| evsj v`tki A_ÖmZtZ grm` m`út` i Ae`vb eYv Kij|
- 16| evsj v`tk ebR m`út` i , i`Z Avtj vPbv Kij |
- 17| cwi te`ki Dci ebR m`út` i cĀZwμqv eYv Kij |
- 18| Kul.R ebvq`bi nevfbaevi eYv w`b |
- 19| nevfbankí I Kvth`e`eüZ MvQ-cvj vi Zvj Kv cĀZ Kij |
- 20| evsj v`tki A_ÖmZtZ ebR m`út` i Ae`vb Dtj L Kij |
- 21| evsj v`tki nevfbaeci cvLi weei Y w`b |
- 22| Mi y nevfbaDbz RvZi eYv w`b |
- 23| nevfbaDbz RvZi ci cvLi Zvj Kv cĀZ Kij |
- 24| wmic`wv RvZi nevfbaqv`Qi big vj Lj |
- 25| ebR m`út` i DcKvi Zv eYv Kij |



DĚi gjuv

cW 2.1:

1| M 2| N 3| K 4| L 5| L 6| N 7| N 8| K

cW 2.2:

1| M 2| N 3| L 4| M 5| M 6| L

cW 2.3:

1| L 2| K 3| L 4| N 5| L 6| N

cW 2.4:

1| L 2| M 3| K 4| M 5| N 6| K

cW 2.5:

1| M 2| M 3| L 4| K 5| L

BDibU 3 Kul. hwiŝKiKiY, Lv`" cwi iPvZ, Avg`wb I iBwb

**BDibU 3 Kul.
hwiŝKiKiY, Lv`"
cwi iPvZ, Avg`wb
I iBwb**

eisj v`k Kul. c`vb t`k| Kul. Dbqtb Kul. hwiŝKiKiYi ,iaz; Ab`Kihp` jhMcy®
Avenl qv, Rigi LûmeLÛZv, cġ`liv`i Nvui Afve Ges KI.tKi mKj ai#bi Dbz Kul.
hšçwZi µq ¶lgZv bv `vKvq Gt`tk cY`hwiŝKiKiY mæe bvl nřZ cvfi | th mKj Kul.
hšçwZ Avgv`i Avenl qvq gvıbmB Ges dmj Drcv`tb GKvšB cġqvRb tm, tjv w`tq
eZġvrb hwiŝKiKiYi gva`tg dmj Drcv`b I cġqvRvZKiYi KvR iinyntqtQ| tmB
mvf` nwn-gym, Mewi`ci I grm` Lvgv`i Zv`i DbwZi Rb` weifbæhšçwZi e`envi nt`Q|
eisj v`k Lwi c tgšmg cġz epócivZ NtU| dtj Gmgq eb`vq AtbK ¶lq-¶wZ nq|
kvZKvtj epó bv nl qvi KvıY cımbi Afvte iwe dmtj i Avkvbjyc dj b cvl qv hvq bv|
eb`vıbqšp I tmP cġvıbi Rb` t`tki weifbæAĀtj tmP I eb`vıbqšy cġi itqtQ| t`k
Lv`" `qs m`úY`bq| gvQ, gvsm, wWg, `x hv Drcbæng Zv wbtRt`i cġqvRtbi Zj`bvq
ht_ó bq| weifbæLv`"km", `x BZ`wı Avg`wb KiřZ nq| eisj v`k cġqvRtbi Zj`bvq
Kul.cřY`i Drcv`tbi cwi gvY Kg ZvB AwaKvsk cY`B AvsıkK Avg`wb KiřZ nq|

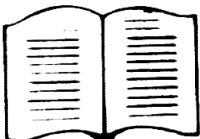
G BDibtu 5ıU cvtV Kul. hwiŝKiKiY, Gi ,iaz; Lvgv`i e`eüZ weifbæhšçwZ, eisj v`tki
weifbætmP I eb`vıbqšy cġi, eisj v`tki Lv`"i eZġvb Ae`v, eisj v`tki Avg`wb I
iBwbthıM` Kul. cřY`i Zıvj Kv I cwi gvY Ges eisj v`tk cġqvRtbi Zj`bvq Kul. cřY`i
Drcv`tbi cwi gvY cřwZ. wel tq Avtj vPbv Kiv ntqtQ|

cw 3.1 eisj v`tk Kul. hmsKxKiYi , iǝj



G cw tk tI Avrb

- ◆ Kul. hms KxKiY Kx Zv ej tZ cvi teb |
- ◆ eisj v`tk Kul. hmsKxKiYi c0qvRbxqZv Dcj wä Ki tZ cvi teb |
- ◆ tKvb&tKvb&t¶¶t Kul. hmsKxKiY mæe Zv kbr³ Ki tZ cvi teb |



Af ktj, Af mgq, Af e`q I Awak `¶Zvi mt_ Lvgvti KvR Ki tZ Kul. hmsKxKiY AZ`sl , iǝj cY¶ fvgKv i vL |

Kul. Dbqtb Kul. hmsKxKiYi Ae`vb Ab`xKvh¶ Dbz wtkj wvfbæ t`k Kul. hmsKxKiYi gva`tg Kul t¶¶t wecæ NuUtqtQ | tmme t`tk Kul. hmsKxKiY i`ayktg kw³ i jvNeB Ktiwb eis dmtji Drcv`b LiP Kwgtq Zvi dj b I , bY euj vstk ewx Kti tQ | tm Zjbvq eisj v`k GLbl Kul. hmsKxKiYi t¶¶t c0 ugK Ae`vq itq tMtQ | Af ktj, Af mgq, Af e`q I Awak `¶Zvi mt_ Lvgvti KvR Ki tZ Kul. hmsKxKiY AZ`sl , iǝj cY¶ fvgKv i vL |

RbmsL`vi µg ewxi dtj dmtji Rvgi cwigvY w`b w`b Ktg AvmtQ | GB µgea¶v evowZ gǝLi Lvevi thvMvb w`tZ mwgZ RvgtZ c¶¶j Z km` Pvl imZ cwi eZ¶ Kti Drcv`b eaR km` Pvl imZ AbyriY Ki tZ nte | G¶¶t mdj Zv AR¶ Ki tZ ntj Kul. hmsKxKiYmn Dbz Pvlver` c¶¶j x Aek`B AbyriY Ki tZ nte | 1928 mb ntZ G Dcgnv`tk AvsukK Lvgvi hmsKxKiYi wvqul , iǝj cvq | 1928 m¶bi 0ivRKxq Kul. Kwgkb0, 1945 m¶bi 0`¶¶¶ AbæÜvbx Kwgkb0, 1951 m¶bi 0cwmK`lv Kul. AbyriÜvbx KwguU0, 1960 m¶bi 0Lv` I Kul. Kwgkb0 Ges cieZ¶Z `vaxZv DEiKvtj 0Lvgvi hmsKxKiY KwguU0 t`tk fvg KI¶, tmP I km` msi ¶¶Y G wZb wvltq wvkl fite hmsKxKiYi mgwvi k Kti |

Kul. hmsKxKiY Kx?

Kul. t¶¶t ewæ nvti dmj Drcv`b, c¶¶qvRvZKiY, msi ¶¶Y c¶¶Z KvR hšj kw³ i e`envi tK Kul. hmsKxKiY etj |

Kul. t¶¶t ewæ nvti dmj Drcv`b, c¶¶qvRvZKiY, msi ¶¶Y c¶¶Z KvR hšj kw³ i e`envi tK Kul. hmsKxKiY etj | G¶¶t hšj kw³ ej tZ tgvkb Ges BwAb DfqtK tevSvq | hmsKxKiY `¶aitbi ntZ cvti cY¶ Ges AvsukK | Kul. t¶¶t mgvq Kvhw hLb hšj kw³ i gva`tg mæübeKiv nq ZLb ZvtK cY¶ hmsKxKiY ej v nq | c¶¶všti dmj Drcv`tbi Rb` wvkl KZK , tjv KvR hšj mrvvth` mæübeKittj ZvtK AvsukK Kul. hmsKxKiY etj | eisj v`tki Avenvlqv, KI tKi mvgwRK I A`¶wZK Ae`v Ges miKvtii mµµq mnthmMzvq eZ¶vrb GLvrb AvsukK Kul. hmsKxKiY i iyntqtQ |

Kul. hmsKxKiYi , iǝj

Kul. hmsKxKiYi , iǝj Acwi mxg | mæav, Amæav Ges Av`¶mvgwRK Ae`v wvtePbvq ti tL t`tk tKvb tKvb t¶¶t Kul. hmsKxKiYi c0qvRbxqZv ev , iǝj AvtQ Zv wbtæAvtj vPbv Kiv ntj v:

exR Drcv`b Lvgvti i Rb`

exR Kul. i Ab`Zg cäv DcKiY | Drcv`b I c¶¶qvRvZKiYi mgq wvæa Kvi tY extRi gv b Ktg thtZ cvti | Gme KvR mvdj `RbKfite Kul. hšjwZi mrvvth` wvfbæexR ea¶ Lvgvti Abvqtm Kiv thtZ cvti |

Kul. MɫelYmɫi i Rb˝

ɫewfbæKul. MɫelYmvi Ges Kul. ɫkɫvi ɫe˝ɫɫv Aek˝B ɫewfbæKul. hšɫwZi mieivn I e˝envi ˝vKɫZ nte| Kul. Dbqɫb PɫB Dchɫ cħɫɫɫ | Gme cħɫɫɫ D˝ɫɫɫbi Ges Kul. ɫkɫvq Qvɫɫi ɫkɫvZ Kɫi ZɫɫZ MɫelYmvi I ɫe˝ɫɫv Kul. hšɫwZi mieivn Aek˝B ɫɫɫZ nte|

KIK chɫq e˝envi i Rb˝

KIK chɫq ɫɫɫɫ ɫɫɫɫ ɫɫɫɫ Kul. hšɫwZ e˝envi m˝e:

K. Rɫg Pɫl

evsj vɫ˝k eQɫi ɫZberi Rɫg Pɫli e˝ɫɫg j ɫɫ Kiv hvq |

- gvɫPP cᵁg mBvn nɫZ Gɫcᵁj i ɫZɫg mBvn |
- RjvBɫqi ZZɫg mBvn nɫZ AvMɫói ZZɫg mBvn |
- bɫf˝ɫi i ɫkl mBvn nɫZ ga˝ Rɫɫvix chɫɫ |

ɫ˝k eZᵁɫb Pɫli
ej ɫ˝i Afve kZKiv 40
fɫM Ges eQɫi e˝ɫɫg
G Afve ˝ɫɫg 70 fɫM|

ɫ˝k eZᵁɫb Pɫli ej ɫ˝i Afve kZKiv 40 fɫM Ges Dɫiv˝ e˝ɫɫg G Afve ˝ɫɫg 70 fɫM| Mi j ɫv RvZ, Lv˝ I ɫPɫKrmvi Afve, PɫiYɫɫi Afve Ges ɫewfbemɫqi eb˝vq Mew˝ cii gZɫ dj Kulɫɫɫ cikɫ˝i Afve ɫeɫB Pj ɫQ| ZvQov th mKj KɫɫKi Pɫli ej ˝AvQ Zviv ˝ɫɫɫj ga˝eZP˝GZ Kg mɫg Zɫɫɫo Kɫi mɫWkɫɫe Rɫg Pɫl KɫZ cvɫibv| dj dɫɫj dj bl ɫv nqbv| Gme Kvi ɫv ɫ˝k cvl qvi ɫɫj ɫi Pɫn˝v ɫeɫB Pj ɫQ| cvl qvi ɫɫj e˝envi i dj e˝ɫɫg Rɫg Pɫl KɫZ ɫKvb Amɫeav n˝Qbv eis Aí mɫg KIK ɫeɫ Mfxi Zvq Rɫg Pɫl Kɫi ɫeɫ dj b cvɫ˝Q| ɫ˝k ɫewfbæ exR eaᵁ Lvgvi I MɫelYv BbɫóUDɫU Ges ɫKQyml˝K abx KIK Zv˝i Lvgvi ɫewfbæ Akɫw˝i Uɫ˝i c-vD e˝envi KɫQ Ges w˝b w˝b Gɫ˝i e˝envi ɫeɫB Pj ɫQ|

L. exR ecb

exR ecb Kivi Rb˝ evsj vɫ˝k Kul. mekɫe˝ij q I evsj vɫ˝k Kul. MɫelYv BbɫóUDU nɫZ exR ecb hšj Ame˝vi Kiv nɫqɫ hv MɫelYmɫi, exR eaᵁ Lvgvi Ges KɫɫKi gvɫv e˝eüZ n˝Q| GgbwK KɫɫKiv GLb exR ecb hšj mieivɫni Rb˝ Avɫe˝b RvɫvɫQ|

M. AvMɫv ˝gb

AvMɫv ˝gɫbi ɫewfbæɫovbx hšj thgb Rvcvbx avb ɫovbxhšj KɫɫKiv GLb ɫɫRɫ˝i dɫj x RɫgɫZ e˝vck nɫi e˝envi KɫQ| n˝v˝ui ˝vK, MɫWᵁ i ˝vK BZ˝w I AvRKj AvMɫv ˝gɫbi Rb˝ ɫKɫPb MɫWᵁ e˝eüZ n˝Q|

N. tɫP cᵁqɫ

dɫɫj i cvɫbi Pɫn˝v tgUɫZ ɫ˝kɫ tɫP c˝wZ AwZwi˝ dɫj dj ɫbvi Rb˝ hɫ˝o bq| ZvB hɫšK c˝wZɫZ tɫP cᵁqɫ AvR ɫ˝k cᵁ˝šAAj chɫɫe˝Z.nɫqɫQ| Kul. hɫšKɫi ɫv ɫɫɫɫ meɫɫq ɫeɫ cħɫv j vɫ Kɫi ɫQ ɫewfbæɫmP hšɫwZ| Gme hšɫwZ ɫv ɫv Lvj, ɫe j, b˝x Ges f˝Mf˝nɫZ cvɫb Zɫj dɫɫj i RɫgɫZ ɫ˝q n˝Q Ges ɫɫɫPi Avl Zvq w˝b w˝b dɫj x Rɫgɫ cɫi gvY evotQ| ɫewfbæɫmP hšɫwZ hv Gɫ˝k e˝eüZ n˝Q tɫ, ɫv nɫj v bj Kc, ɫUɫWj cv˝ú, cvl qvi cv˝ú, AMfxi bj Kc Ges Mfxi bj Kc, BZ˝w | eZᵁɫb evsj vɫ˝k ɫewfbæAAɫj cvɫbi ˝ɫ ɫbP ɫbɫg hv lqvq Mfxi ev AMfxi bj Kc Zv˝i ɫbaᵁi Z ɫɫɫPi Avl Zvɫ˝ RɫgɫZ tɫP ɫ˝Z cvɫQbv| G ɫɫɫɫ cvl qvi cv˝ú ˝ɫZvi mɫ˝b˝x ev ɫe j nɫZ RɫgɫZ tɫP ɫ˝Z cvɫi | ɫɫɫPi Avl Zvq Rɫgɫ cɫi gvY w˝b w˝b ev ɫv cvl qvq

Kul. hɫšKɫi ɫv ɫɫɫɫ
meɫɫq ɫeɫ cħɫv j vɫ
Kɫi ɫQ ɫewfbæɫmP
hšɫwZ|

Ki tKiv tenk cwi gvY Rng tZ avb Pvl Ki tQ| dtj i we tg smtg Ab vb dmj we tkl Kti Wvj I gkj v Rv Ziq dmtji Rngi cwi gvY Ktg hv tQ| GtZ hv I dmtji ub eo Zv evotQ uK S Ab dmtji Nv UvZ t Lv v t Q hvi dtj Gme dmj we t k t t K Avg v mb Kti Pmn v ug Uv tZ nt Q | t tki Lv m gm vi mgv avb Ki tZ ntj tenk cwi gvY Rng t m t Pi Avl Ziq Avb tZ nte| Avi ZvB tmP h s c m Zi Pmn v G t t k evot ZB v K te | dmj Drcv t b tmP AZ s l i z c y Dc Ki Y | AZ Ge Kul. h m s K x Ki t Yi G Dc Ki Y u w e t k l K ti dmj Drcv t b tmP h s c m Zi i Z i A c w i m g |

O. dmj msi րյ

Av Mv Qv, ti v M I tcv Kiv-gv Ktoi Av m g Y nt Z Rngi dmj i րյ i Rb n Pnj Z I k w Pnj Z we f b e t u t v i e e n v i K i v n t Q | t t k G t i e e n v i w b w b t e t o P t j t Q | e Z Գ v t b G m e h s c m Z Av g v t i t t k B Z w i n t Q | D e d m t Q J l a t e v i R b D P P v t c i t u t v i Z w i K i v n t t Q h v t t k i D E i v A t j i Av g e v M t b e v c K f v t e e e u Z n t Q | Z v Q v o r K u l . g s Կ v j t q i D w m c m s i րյ y w e f v M w e t y G j v K v q K u U b i k K e v A v c b v k K c Թ q v t M i R b t Q v U t Q v U D t o v R v n v R e e n v i K t i v t K |

P. gvovB I c Թ u q K i Y

Av Dk I t e t i v a v b K v U v i c i e y o n t j A t b K m g q g v o v B K v t R i w e N a v t U | c P n j Z g v o v B h s i (P a d d l e t h r e s h e r) G t րյ t t e k i z i c v t Q | t t k i w e f b e t v t b G g v o v B h s i z w i n t Q | t h L v t b A v t M M i y v t q g v o v B K v R K i v n t Z v , M i y K t g h v l q v q G m e K v R G L b c P n j Z g v o v B h t s j m v n v t h K i v n q | i a y Z v B b q , M g g v o v B h t s j D m e t b i t P o v l t t k P j t Q | a v b , m v i l v I g k j v t h t j v t X u k u K s e v N v b i m v n v t h f v z v t b v n t Z v G L b G m e K v R t g u k t b i m v n v t h K i v n t Q G e s e v s j v t t k i c Թ q c Թ Z u M t g G L b G m e u g j P j y n t q t Q |

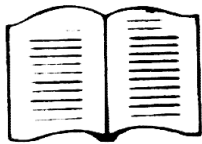
Kul. h m s K x K i t Y i e o m y e a v G B t h A r m g t q , K g k i g K w t q , րյ Z v i m t , K g L i t P A w a K d m j d j v t b v m e e | K u l . h m s K x K i t Y i A b Z g c Թ v b m g m v n t Q K u l . K v t R u b t q v n R Z k i g t K i m e e t e K v i Z i | t t k i A t a րյ K i l t e n k k i g K K u l . u k t i u b t q v n R Z | t t k K u l . t րյ t t c y h m s K x K i Y n t j A w a K v s k k i g K t e K v i n t q c o t e | Z v B e Z Գ v b t c Թ v t u e v s j t t k A v s u k K h m s K x K i Y B t k t |

t t k i c u i t e t k i K v w e t e P b v K t i t k i x c Թ v րյ w t q D m e Z h s c m Z K u l . t րյ t t t e n k j v M m B n t e e t j w e t e P Z | Z v B K u l . h s c m Z m i e i v t n i e e v K i t Z n t e | i a y Z v B b q G m e h s c m Z i L Թ v i v h s րյ s k t h b m n t R B n v t Z i K v t Q c v l q v h v q t m e v c v t i l m R v M րյ i v L t Z n t e | Z v B t t k L Թ v i v h s րյ s k D r c v t b i K v i L v b v K i t Z n t e b Z e v t h m e K u l .

h s c m Z w e t k n t Z A v g v m b K i v n q Z v t i L Թ v i v h s րյ s k l t h b K I K m e m g q n v t Z i K v t Q c v q t m e e v i v L t Z n t e |

Abny b (Activity): evsj vt t k c y K u l . h m s K x K i t Y i c Թ q v R b i q Z v I m e e m g m v m g r A v t j v P b v K i b |

Kul. h m s K x K i t Y i A b Z g c Թ v b m g m v n t Q K u l . K v t R u b t q v n R Z k i g t K i m e e t e K v i Z i |



mvi gg
dmj Drcv b, c Թ u q v R i Z K i Y , m s i րյ y c Թ v u Z . K v t R h s k w i e e n v i t K K u l . h m s K x K i Y e t j | e v s j v t t k i t c Թ v t u K u l . t րյ t t A v s u k K h m s K x K i Y m e e | e x R e a Թ L v g v i , K u l . M t e l Y v M v i I K I K c h Թ h t K v b t K v b t րյ t t h m s K x K i Y K i v t h t Z c v t i | K u l . t րյ t t R u g P v l , e x R e c b , A v M v Q v g b , t m P c Թ q v M , d m j m s i րյ y G e s g v o v B I c Թ u q v K i t Y i K v t R u K O y u K O y h s c m Z e e n v i K i v n t Q G e s G t i i z i w b w b e v o t Q |



cvřVřEi gj`ıqb 3.1

mıWk DEři i cvřkřUK ıPı (√) ı b |

- 1/ tKıv&mb nřZ Dcgnřř`řk Kwl.hmřřKıKıřYi nel qıW , i řřı cıq ?
K. 1928 L. 1945 M. 1951 N. 1960
- 2/ evsj vř`řk tKıv ai řbi Kwl.hmřřKıKıY Dchřř ?
K. cřřhmřřKıKıY L. AvıřıkK hmřřKıKıY
M. Avıř hmřřKıKıY N. kb` hmřřKıKıY
- 3/ ř`řk eZřıřb PıřI i ej ř`i Afıře kZKıv KZ fıřM ?
K. 20 L. 30 M. 40 N. 50
- 4/ Rıř PıřI tKıv Kwl.hřřřtenk e`envi nř`Q ?
K. Uřřı cıřD L. ıWmK cıřD
M. řıvřUıřřFıı N. cıř qıı ıUj vı
- 5/ Kwl.hmřřKıKıY meřPřřq cřřıı j vř Křı řQ tKıv řřřřř ?
K. Rıř Pıř L. řmP cřřqıřM
M. AvıřQıř `gb N. exR ecY
- 6/ c` Pıřj Z gıvıB hřřřřtKıv&dmj gıvıBřřqı Rb` e`eüZ nq ?
K. avb L. Mg M. AvL N. mııııv
- 7/ MıřřWř i`ıK Kx KıřřR e`envi Kıv nq ?
K. JIa ıQUıřřbıv KıřřR L. řmřřPı KıřřR
M. ıboıřbıx KıřřR N. gıvıB KıřřR

8| KZB, gvoib, Svoib BZ`wi hšcwZ

- Kvt`í
- tKv`vj
- tctWj t_ñvi
- Nmb
- B¶zgvoib Kj
- Kzv
- Pvj mb
- Wnj
- SvUv
- tMBb Kvtj ±i
- KY¶mj vi

nva-gjMi Lvgiti e`euZ hšcwZ

nva-gjMi Lvgiti th me c¶qvRbxq mi Ävgw` e`euZ nq tm, tjv ntjv t

- gjMtK Lveri t`qvi Rb` Lveri cvT
- cmbi cvT
- ¶Wg cirovi ev
- I Rb Kivi e`vtj Ý
- ¶Wg tM¶S Gi hšj
- gjM `ivbš¶i i L¶v
- ¶Wg ivLvi cvT
- Lv`¶¶gkv¶bvi hšj
- n¶B¶M¶gUvi
- _vtg¶gUvi
- KvKi I ¶Sb¶Ki tLvmi ivLvi cvT
- t`ú¶vi
- nmi tKb evZ
- I Rb gvcvi hšj
- tKv`vj
- Lj¶c
- evj ¶Z
- tV¶ Kivri hšj

Lvgiti ¶Wg d¶t¶bvi hšcwZ

- Bb¶KD¶eUi
- tRb¶i Ui
- W¶B evj ; I t¶qU evj ; _vtg¶gUvi
- ¶Wg cix¶vi evZ
- ¶Wg gvcvi e`vtj Ý
- tUevj

etjvi Lvgiti hšcwZ

- e¶vi ev Zicvq¶bi hšj
- ¶PKM¶W©

Mewi` cii Lvgvfi e`euZ hšcwZ

Mewi` cii Lvgvfi wbaaj uLZ hšcwZ _vKv Avek`K t

- wgwés tcBj
- `g gvcvi evtKU
- `jai eo evtKU
- `g gvcvi e`vtj Y
- bvoB KvW
- Wtg ev `g cvI
- QuKub
- `g t`vntbi hšj
- wi· v ev F'vMvox
- wdiW's tevZj
- úBj evt'v
- Btj KvUK Mm&Pics tgvkb
- `vbr Lv` wgvvtbvi hšj
- g`vbtaj Mm&Pics tgvkb
- mwfñ óKvi
- cvnb Zvc t`qvi wvUvi
- ÷vR cvvú
- NYqbgvb tµb
- tctWj t`mvi
- KYqmj vi
- Lv` entbi Uij
- ci gvcvi hšj
- tnm cvBc
- cvmbi cvI
- Lv` gvcvi hšj

tfovi tkqwis Kivi hšcwZ

- cvl qvi WBtfb tkqwis tgvkb
- wKevi ev n`vU tkqvi

tLvrvi Kivi hšcwZ

- evwRim K`vt ÷ Ui
- avi vtj v PvKz
- i veri wi s

Miyevt'NovtK byj ev Rz'v civt'vbi hšcwZ

- evmc&
- WBS bvBd
- tUvBs bvBd

wvnm`Kivi hšcwZ

- Btj KvUK wv nYñ
- nYqkqvi

- Wbtj Ui
- di tmc
- ti Rvi

- n'Zni
- wPgUv
- evKvi

evsj v`tk wnfbo`tmP I eb`v ubqšy cKí

evsj v`tki c`avb tmP I eb`v ubqšy cKí , tjv ntjv -

1. M½v-KtciZv`q cKí
2. KY@jx eúglyx cKí
3. DËi e½ Mfxi bj Ke cKí
4. Prucy tmP cKí
5. DcK j xq eia cYe`mb cKí
6. tMgZx cKí
7. XvKv-bvi vqYMA-tWgiv tmP cKí
8. wZ`í eva cKí
9. epcy eb`v w`ti va eia cKí
10. ewi kvj tmP cKí |

G cKí , tjv m`útk`bt`aAvj vPbv Kiv ntjv:

M½v-KtciZv`q cKí

Kwóqv tRjvi tfovgivi Kv`Q cÚv b`x t`_tk cwb Ztj Lv`tj i minvth` epËi Kwóqv, htkvi I Ljybv tRj vngt`ni e`vcK AĀtj tmP t`qvi Df`i`tk` M½v-KtciZv`q cKí `vcb Kiv ntqtQ| cKí i c`avb j`q` cwb tmP ntj I eb`v ubqšy I hvZivqZ e`e`vi Dbq`tbl w`tkl figKv cvj b Ki`tQ|

Kwóqv tRjvi tfovgivi Kv`Q cÚv b`x t`_tk cwb Ztj Lv`tj i minvth` epËi Kwóqv, htkvi I Ljybv tRj vngt`ni e`vcK AĀtj tmP t`qvi Df`i`tk` G cKí `vcb Kiv ntqtQ| Gi dtj 84 nvrvi tguUK Ub AwZiv³ Lv` Drcv`bte | G cKí wU wZbvU BDwbU wef³ | G cKí ev`evq`tb i Df`i`tk` cÚvZxti tfovgivi Kv`Q GKwU cv`ú tókb `vcb Kiv ntqtQ| GB cv`ú , tjv cwi Pjv bvi Rb` 8200 wKtj vl qvU q`gZv m`úbe GKwU w`y` tK`^a `wcz ntqtQ| G cKí i c`avb j`q` cwb tmP ntj I eb`v ubqšy I hvZivqZ e`e`vi Dbq`tbl w`tkl figKv cvj b Ki`tQ|

KY@jx eúglyx cKí

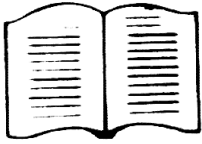
KY@jx eúglyx cKí c`avbZ w`y` Drcv`b cKí ntj I Gi minvth` KY@jx b`xi wba`Ātj i eb`v ubqšy, c`q 650 wKtj wgvUvi tbSPj vPtj i mgy`e`v Ges 4 j`q` tn±i Rwg`Z tmP t`qvi hvq| cveZ` PĀMóg tRjvi KvBvBtq KY@jx b`xi Dci 46.6 wgvUvi DpZ 660 wgvUvi `xN`Ges 240 wgvUvi Pl ov GKwU eva w`tq G cKí `vcb Kiv ntqtQ| G Kw`g n`i cwb i minvth` i v`w`bqv AĀtj eQti eZ`v`tb `wU dmj Drcv`b Kiv m`e` n`t`Q| G n` t`_tk eZ`v`tb cÚZ eQti 5 nvrvi Utbi I tenk gvQ cvl qv hv`Q|

GwU GKwU eúglyx cKí | GwU c`avbZ w`y` Drcv`b cKí ntj I Gi minvth` KY@jx b`xi wba`Ātj i eb`v ubqšy, c`q 650 wKtj wgvUvi tbSPj vPtj i mgy`e`v Ges 4 j`q` tn±i Rwg`Z tmP t`qvi hvq| cveZ` PĀMóg tRjvi KvBvBtq KY@jx b`xi Dci 46.6 wgvUvi DpZ 660 wgvUvi `xN`Ges 240 wgvUvi Pl ov GKwU eva w`tq G cKí `vcb Kiv ntqtQ| G Kw`g n`i cwb i minvth` i v`w`bqv AĀtj eQti eZ`v`tb `wU dmj Drcv`b Kiv m`e` n`t`Q| G n` t`_tk eZ`v`tb cÚZ eQti 5 nvrvi Utbi I tenk gvQ cvl qv hv`Q|

DËie½ Mfxi bj Kc cKí

G cKí i cwi Kí bv Ablyvq t`tki DËivĀtj Pvi wU epËi tRjv - iscy, ivRkvnx, e, ov I w`bvRc`tj 360 wU Mfxi bj Kc Ges 760 wU cvl qvi cv`ú i minvth` gnv`v I evoj b`xi cwb w`tq 1 j`q` tn±i Rwg`Z cwb i tm`Pi e`e`v Kiv ntqtQ| G AĀtj evrmi K ewócvZ Kg Ges kvZKv`tj b`x`Z cwb Lgy Kg cwi gvY`_v`K | ZvB G GjvKvq tm`Pi Rb` Mfxi bj Ke Ges cvl qvi cv`úB tenk Kv`Rix | GQvovl 10,500 wKtj vl qvU w`y` Drcv`b q`gZv w`kó GKwU w`y` tK`^a I P`tli Rwg`Z cwb mieiv`ni Dc`thvMx bvjv, c`avb bvjv t`_tk w`di bvjv Ges cÚ bvjv I G cKí i Ašf`|

G cKí i cwi Kí bv Ablyvq t`tki DËivĀtj Pvi wU epËi tRjv - iscy, ivRkvnx, e, ov I w`bvRc`tj 360 wU Mfxi bj Kc Ges 760 wU cvl qvi cv`ú i minvth` gnv`v I evoj b`xi cwb w`tq 1 j`q` tn±i Rwg`Z cwb i tm`Pi e`e`v Kiv ntqtQ| G AĀtj evrmi K ewócvZ Kg Ges kvZKv`tj b`x`Z cwb Lgy Kg cwi gvY`_v`K | ZvB G GjvKvq tm`Pi Rb` Mfxi bj Ke Ges cvl qvi cv`úB tenk Kv`Rix | GQvovl 10,500 wKtj vl qvU w`y` Drcv`b q`gZv w`kó GKwU w`y` tK`^a I P`tli Rwg`Z cwb mieiv`ni Dc`thvMx bvjv, c`avb bvjv t`_tk w`di bvjv Ges cÚ bvjv I G cKí i Ašf`|



mvigg®

gvV dmj Drcv`tb th mKj hšćwiz e`eüZ nq tm,tjv ntjv Pıflı Rb` e`eüZ hšćwiz,
Rııg mgvb Kivi hšćwiz, exR ecb hšćwiz, AvDov f`qvi hšćwiz, ıbwıo f`qvi hšćwiz,
tmP I ıbwıktıbi hšćwiz, Avc`bıkK e`enıtıı hšćwiz, KZØ, SıovB, gvovB BZ`ıw
KıfR e`eüZ hšćwiz | gjıM Lıgvıti ııwıfbıehšćwizı gfa` ıWg dııııbıı Rb` BbıKDıeli
e`eüZ nq | Mıytfov, tNıov I grıı Lıgvıti ııwıfbıehšćwiz e`enıı Kıv nq | evsj vt`tk
cāvıb cāvıb tmP I eb`ı ıbwıqšy` cıKı ntjv 10ıııı



ciVvEi gj`vqb 3.2

mivK DEti i ciVvEi UK vPy (v) v b|

1| tbcvmK t`uqvi tKvb KvR e`euZ nq ?

K. vbovbx t`I qvi Rb`

M. tmP t`I qvi Rb`

L. gvovB KvRi Rb`

N. Avc`bvK e`eniv i Rb`

2| vWg dlvvbi Rb` tKvb hSje`eniv Kiv nq ?

K. nvBtMvUvi

M. _vtgvUvi

L. BbvKDteUi

N. tRbv i Ui

3| tvWj t`mvi Kx KvR e`euZ nq ?

K. gvovB Kivi KvR

M. `y t`vntbi Rb`

L. Nvm KvUvi KvR

N. `y cixv Kivi KvR

4| grm` cRbb n`vPvi tZ tKvb hSje`euZ nq?

K. teUv` Rvj

M. tmvUtdDR

L. BbvKDtekb tevZj

N. v GBP vUvi

5| ersj vt`tk eb`v I tmP vqšy cKv Kqv ?

K. 10 vU

M. 15 vU

L. 12 vU

N. 9vU

6| Mv-KtciZv cKv tKvb b`x t`K cvb e`eniv Kti ?

K. KtciZv

M. tgNbv

L. cUv

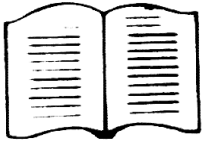
N. hgby

cW 3.3 ejsj v`tki Lv`i eZgub Ae`v (Lv`km, gvQ, `g, Wlg I gsm)

G cW tkI Avcb



- ♦ ejsj v`tki Lv` km`i eZgub Ae`v eYv KiZ cvi`eb|
- ♦ gvQ, gsm, Wlg, `g BZ`w` Drcv`tbi cwi gvY m`ut`K`Z` c`lvb KiZ cvi`eb|



ejsj v`tki gvbj i c`vb tckv ntj v Kwl.thLv`b tgvU k`gkw`i 68.5% wbtqmRZ| t`tki Af`šli`xY Drcv`tbi c`q 35% Avtm KIRvZ `e` t`tk| Gt`tki Rwg DeP ntj I KIK `wi`q bZb bZb chv, Dbz` exR I Kwl.DcKiY e`envti c`v`c` _vKvq c`Z GKK RvgtZ Drcv`b m`švI RbK bq| avb, Mg, cW, AvL, ZvkvK, P, `Zj exR, Wvj, km` Ges Avj yGt`tki c`vb dmj | w`fbaei`tbi kvKmw` Ges gkv v RvZxq dmtj i Pvl I Gt`tk nq| ejsj v`tk eZgub Kx cwi gvY Lv` km` Drcv`b Zv wbt` (QK - 1) t`qv ntj v:

ejsj v`tki gvbj i c`vb tckv ntj v Kwl.thLv`b tgvU k`gkw`i 68.5% wbtqmRZ| t`tki Af`šli`xY Drcv`tbi c`q 35% Avtm KIRvZ `e` t`tk|

QK - 1: ejsj v`tk Drcv`Z w`fbaei`t i cwi gvY|

dmj	Drcv`b (000 tg: Ub)		
	1991-92	1992-93	1993-94
avb	18255	18341	18302
Mg	1065	1176	1131
ewj	12	11	6
f`Ev	3	3	3
AvL	7446	7507	7111
Wvj dmj	519	503	536
%Zj exR	461	475	367
gkv v	322	302	330
tMvj Avj	1379	1384	1438
kvKmw`	1100	1198	1165

Dc`iv` QK ntZ t`Lv hvq th avb, Mg, Wvj dmj, gkv v RvZxq km`, tMvj Avj yGes kvKmw`i dj b 1991-92 m`bi Zjvq 1993-94 m`b tet`tQ|

b`xgvZK.ejsj v`k grm` m`ut` mg`| w`KU AZt`ZI GLvbKvi Af`šli`xY Rj vKq gv`Q ficj`Qj | t`tki grm`w`e m`ut`vq Af`šli`xY c`eb fvgtZ grm` AvniY Kti RweKv w`b`n KiZ| c`Kw`ZK I gvbj i m` w`fbaei`tY Af`šli`xY g` Rj vktqi cwi gvY I tmLv`b Drcv`Z grm` m`u` MZ w`Zb `k`K gvi vZK nwm t`ct`tQ| mgj`t`tk grm` AvniY Ges eZgub DcKj xq AA`tj w`Psv Pvl ejsj v`tki A_`w`Zt`Z Bw`Zei`PK c`fve tdtj`tQ| Af`šli`xb g` Rj vktq gv`Qi Drcv`b nwm t`ctj I m`g`v`K grm` I DcKj xq AA`tj w`Psv Pvl i gva`tg gv`Qi Drcv`b ew`xi m`tebv i`qtQ| eZgub w`fbaei`t R m`u` ntZ c`B grm` m`u` i Drcv`b aiv nt`qtQ c`q 12 j`q tgvUK Ub hv w`tai Q`K (QK - 2) t`Lv`bv ntj v:

сүтүкү гж'ыкб 3.3



милК ДЭти и сүтүкүК Пы (√) и`б|

- 1| т`ткi тгvU кжкi³ i KZFvM Күл.КүтR ибтqмRZ ?
 K. 60.5 fvM L. 66.5 fvM M. 68.5 fvM N. 72.7 fvM
- 2| артби Drcv`b eZ@vrb KZ нvRvi тгvUК Ub ?
 K. 18255 L. 18302 M. 18341 N. 18432
- 3| Af`šli xY gŷ Rj vktq gvQ i Drcv`b tKvb&Kvi tY KtgtQ ?
 K. `RieK Kvi tY L. tššizK Kvi tY
 M. cšKuzK Kvi tY N. cšKuzK I gvbyl i mŷ uewfbaKvi tY|
- 4| tKvb&ai tbi Rj vktq gvQ tevk Drcbaŋq ?
 K. gŷ Rj vkq L. ex Rj vkq
 M. Avatj vbr cmbi Rj vkq N. mvgŷ K Rj vkq|
- 5| tKvb&Rj vktqi AvqZb tevk ?
 K. gŷ Rj vkq L. Avatj vbr Rj vkq
 M. mvgŷ K Rj vkq N. ex Rj vkq|
- 6| eZ@vrb т`тк gvstmi Drcv`b KZ тгvUК Ub ?
 K. 5,04,702 L. 3,98,000 M. 3,76,000 N. 5,47,205

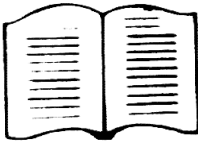
cw 3.4 evsj v`k Avg`wb I i BwbthM` Kul.cY`i Zwj Kv I cwi gvY



G cvV tkfI AvciB

- ◆ wef`k nZ tKvb tKvb cY` Avgv`i t`tk Avg`wb KiZ nq tm Z_` cDvb KiZ cri`eb|
- ◆ evsj v`k nZ thme Kul.cY` wef`k i Bvb nq tm,tj vi big ej tZ cri`eb|
- ◆ tKvb cY` Kx cwi gvY Avg`wb ev i Bvb nq Zv ej tZ cri`eb|

Avg`wbKZ cY`



AZ`waK RbmsL`vi P`tc t`k AvR fvi v`v`sl Ges th Lr`km` Drcb`nq Zv G evowZ RbmsL`vi Rb` ht`o bq| ZvB cDZ eQiB Avgv`i wef`k nZ Lr` Avg`wb Kti G NvUwZ Avgv`i wef`k nZ Lr` Avg`wb Kti G NvUwZ cY` KiZ nq|

evsj v`k Kul.cDvb t`k| Gt`tki gwU I Rjevqydmj Drcv`tbi Rb` AZ`sl Dc`thvMx| wKs`AZ`waK RbmsL`vi P`tc t`k AvR fvi v`v`sl Ges th Lr`km` Drcb`nq Zv G evowZ RbmsL`vi Rb` ht`o bq| ZvB cDZ eQiB Avgv`i wef`k nZ Lr` Avg`wb Kti G NvUwZ cY` KiZ nq| wkt`i i KvDvgj wntmte tek wKQycY` wef`k nZ Avg`wb KiZ nq| e`; wkt`i i Rb` cDZ eQiB Avgv`i Zjv Avg`wb KiZ nq| wki Lr` wntmte wef`k nZ cDZ cwi gvY , av`g Avg`wb KiZ nq| cDvb cDvb Kul.cY` th,tjv wef`k nZ Avg`wb KiZ nq Zv LwZqvB wbt`w(QK - 1) t`qv ntj v:

QK - 1 t Avgv`wbKZ.cDvb cDvb Kul.cY`i Zwj Kv|

cY`i big	1990-91 (00000`tkwR)	1991-92 (00000`tkwR)	1992-93 (00000`tkwR)
QwMj I tfovi gism	814	522	806
, av`g	60006	45281	37617
wN I gvLb RvZxq mvgM`	397	1101	456
Avj y	772	141	1060
wcqvR I imy	71423	118911	65335
wj wMDg RvZxq kvKmw`	95550	55669	63929
ev`vg	7742	5332	7828
tLRj, Avbvi m, Avg	1707	1358	3819
Kgj v tj ey	2745	2886	1050
Avtcj , bvkcmwZ BZ`w`	2031	8383	6641
`vi yPib	1989	1719	1833
Rqdj , Gj vP, BZ`w`	693	802	1078
Mg	1606000	1475000	1033000
Pj	16000	18000	20000
MwQ-MwQov JIa I cDvabx wkt`i i Rb`	984	1445	1294
mqv`xb `Zj	194997	328148	195044

cvg`Zj	37263	96771	79880
uPnb	13800	5000	73000
Zjv	3.650	4.245	7.638

(Drm: u.e.u.Gm. 1994)

iBmbthvM` Kul.cY`

t`tki`ef`uK gyt
AR#bi msnfM Avtm cvU
I Pr iBmb LvZ ntZ
ZvQvor Avgiv iKbv I
ingvqZ gvQ, Pvgov,
ZvgvK I ZvgvK RvZ `e`
BZ`w` mef`tk iBmb Kti
_uK/

Avgiv th`iaYkul.cY` mef`k ntZ Avg`vnb KwI Zv bq, uKQymKQycY` Avgiv mef`tk iBmb I Kti _uK/ GK mgq GKtPuUqv cvU iBmbKviK t`k intmte ersjvt`tki bvg GK baf`i uQj | eZ@vbtI t`tki`ef`uK gyt AR#bi msnfM Avtm cvU I Pr iBmb LvZ ntZ | ZvQvor Avgiv iKbv I ingvqZ gvQ, Pvgov, ZvgvK I ZvgvK RvZ `e` BZ`w` mef`tk iBmb Kti _uK/ c`avb c`avb Kul.cY` th`tjv Avgv`i t`k ntZ mef`tk iBmb Kiv nq Zvt`i bvg I cwi gvY ubt`e(QK - 2) t`qv ntjv:

QK - 2 t cwi gvYmn iBmbthvM` c`avb c`avb ctY`i Zvjv Kv/

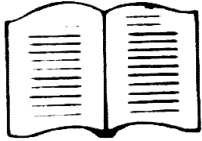
ctY`i bvg	1990-91 (00000tKuR)	1991-92 (00000tKuR)	1992-93 (00000tKuR)
ingvqZ gvQ	5395	4967	6418
iKbv, jeYv ³ I agvqZ gvQ	1263	1770	1260
kvKmiâ	117	203	310
Pv	26862	24990	29620
uPUv_o	7	6	--
%j	3030	7482	400
ZvgvK I ZvgvKRvZ `e`	1185	2427	1083
Pvgov	11496	13165	11966
cvU I cvURvZ `e`	435458	489814	432982

(Drm: u.e.u.Gm. 1994)

DcwiD³ iBmb cY` Zvjv KvI w`tk j`qI` Kiti t`Lv hvq th`uKQymKQyiBmb cY` thgb ingvqZ gvQ, Pv, Pvgov BZ`w` i iBmbi cwi gvY tetotQ/ cvU I cvURvZ `e` mef`Ptq tenk cwi gvY`ef`uK gyt AR# Kiti I Gi iBmbi cwi gvY 1992-93 mtb Ktg tM`tQ/ Af`silxy Drcv`b emotq Ges Dbz` gv`bi cvU I cvURvZ mvgMbi iBmb evRvi mjo`i gva`tg G NuUvZ ctY` Kiv m`e/ iBmb Avtqi tek GKUv fij Ask Avtm Pvgov t`tk hv ersjvt`tki A`BvZtZ Dbq`bi avivewvKZv eRvq titL`tQ/ P`tqi Drcv`b w`b w`b evotQ Ges tm m`t/2 evotQ Gi iBmbi cwi gvY Ges t`tki iBmb Avq/ ingvqZ I iKbv gvQ iBmbi cwi gvYI mgvbt`q ep`x cit`Q/

eZ@vbt Avg`vmbi cwi gvY iBmbi Zjv`vq tenk/ RvZxq Avtqi weivU Ask e`q nq Lv` Avg`vmbi Rb`/ th`eQi t`tk eb`v, Liv, ev Ab` tKvb c`uKvZK`#hM AvvZv ntb`tm eQiB Lv`km` dj`bi Dci Gt`i weifc`c`ve cto/ dtj`dj`b Ktg hvq Ges ZLbB mef`k ntZ

Lv`km` Avg`mb Kitz nq| Kul.nbfP evsj v`ki mmeR Dbq#bi j`q` Kul#KB c`vb`
w`z nte tek| t`ki Af`šixY Pnn`v ci-Y Kti Kul.RvZ c`Y`i iBmbi cwi gvY evotZ
cvi tj B t`k A_#owZK mgwxi c`_ GwMtg hite|



mvi gg®

evsj v`k Kul.c`Y`i Avg`mbi cwi gvY iBmbi Zjvbrq tek| Avgv`mbKZ.c`vb c`vb
Kul.c`Y`i ntj v Mg, Pvj, wPib, _civ`g, mqmeb`Zj, cv`u l`qj, wewfbæitbi gk j v, Wj j ,
dj Ges JIa l c`hrabx uk`i i Kivgij | me#Ptq tek Avg`mb Kitz nq Mg, Pvj l
t`fiv` tZj | evsj v`k nZ th me cb` me`k iBmb nq tm`_tjvi g`a` Dj-L`hvm` ntj v
wngmqZ l iK#br gvO, Pv, Pvgov, cvU l cvURvZ `e` BZ`w` | me#Ptq tek `e` ukK gjv
Avq nq cvU l cvURvZ `e` iBmb Kti |

cvVvEi gj`iqb 3.4



mivK DEti i cvtk;UK wPy (v) w`b|

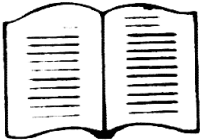
- 1| cŃZ eQi w`k n`Z Avgv`i Kx Avg`mb Ki`Z nq ?
K. Lv` L. Pv M. Pvgov N. cvURvZ `e`
- 2| Lv` ktm`i gta` tKvbU tenk cwi gv`Y Avgv`mb Ki`Z nq ?
K. mqvexb `Zj L. Mg M. Prj N. Avj y
- 3| tKvb Kul.RvZ cb` i Bmb Kti evsj v`k metP`q tenk `et`ukK gy` Avq Kti ?
K. Pv L. wngwqZ gvQ M. cvU I cvURvZ `e` N. Pvgov
- 4| evsj v`k n`Z metP`q Kg Kx i Bmb nq ?
K. wngwqZ gvQ L. kvK mwa M. wPuv, o N. `Lj
- 5| wbtai tKvb cY`wU i Bmbi cwi gv`Y wgv`stq evotQ ?
K. wngwqZ gvQ L. `iKbv, j ebr³ I a gwqZ gvQ
M. `Lj N. ZvgvK I ZvgvKRvZ `e`
- 6| wbtai tKvb cY`wU i Bmb Kti evsj v`tki A_ wvZK Dbq`bi avivewKZv eRvq
ti`L`Q ?
K. cvU I cvURvZ `e` L. Pv M. Pvgov N. wngwqZ gvQ

cW 3.5 evsj vř`tk cřqvRřbi Zjybvq Kul.cřY`i Drcv`řbi cwiqvY



G cW řkřl Avcıb

- ◆ evsj vř`tki cřvb cřvb Kul.cřY`i bvg ej řZ cvi řeb|
- ◆ řKvb cY` Kx cwiqvY Drcbmq Zv RvbřZ cvi řeb|
- ◆ řKvb cY` Kx cwiqvY cřqvRřb Zv Dřj Ľ Ki řZ cvi řeb|
- ◆ řKvb cY` cřqvRřbi Zřbvq NvUıZ ev DřřEj Zv kbr³ Ki řZ cvi řeb|



cW_xri meřřř Rbeřj ř`k řřřme evsj vř`tki Lv`km` Drcv`řbi nvi evovřbv cřqvRřb| Avi řmRb` cřqvRřb Dbř cřyvř I mgq gZ KlřKi řbKU j řMmB cřyvř n`řřř | Kul.řřřř bZb bZb cřyvř řřř nřZ _vřřj Kg mgřř ř`ř cwi mi Aver`x RıgřZ AwaK dmj dıj řř AwaK Drcv`b Kiv mře nřj| D`P dj bkıj RvřZi Pvl I bZb bZb cřyvř e`evřři dřj řeMZ KřřK ermři AwaKısk dıj řb Drcv`b AřbKıřřk evř řcřřřř Křř RbmsL`v evřı ř`K řeřePbvq Avřřj Kul.cřY`i Drcv`b řm Zjybvq evřovb, ZvB G NvUıZ cıřYi Rb` AwaKısk Kul.cY`B Avqvř`i řeř`k nřZ Avqv`vb Ki řZ nq|

evsj vř`tk Kul.cřY`i Drcv`b cřqvRřbi Zjybvq AwaKısk řřřřř Kğ| cW_xri meřřř Rbeřj ř`k řřřme evsj vř`tki Lv`km` Drcv`řbi nvi evovřbv cřqvRřb| Avi řmRb` cřqvRřb Dbř cřyvř I mgq gZ KlřKi řbKU j řMmB cřyvř n`řřř | Kul.řřřř bZb bZb cřyvř řřř nřZ _vřřj Kg mgřř ř`ř cwi mi Aver`x RıgřZ AwaK dmj dıj řř AwaK Drcv`b Kiv mře nřj| D`P dj bkıj RvřZi Pvl I bZb bZb cřyvř e`evřři dřj řeMZ KřřK ermři AwaKısk dıj řb Drcv`b AřbKıřřk evř řcřřřř Křř RbmsL`v evřı ř`K řeřePbvq Avřřj Kul.cřY`i Drcv`b řm Zjybvq evřovb, ZvB G NvUıZ cıřYi Rb` AwaKısk Kul.cY`B Avqvř`i řeř`k nřZ Avqv`vb Ki řZ nq|

cřqvRřbi Zjybvq Avğiv Kx cwiqvY Kul.RvZ cY` Drcv`b Kwi Ges KZUKřNvUıZ ev DřřEj Zvi cwi msL`vb řbřřřř(QK - 1) ř`qv nřj v:

QK - 1 t Kul.cřY`i cřqvRřb, Drcv`b I NvUıZ ev DřřEj cwiqvY (1992-93) [řřřřř řKıR]

cřY`i bvg	cřqvRřb**	Drcv`b	NvUıZ (-) ev DřřEj (+)	Avğ`vb/iřvb (%)
avb	1,83,71,000	1,8341,000	-30,000	0.16
Mğ	22,09,000	11,76,000	-10,33,000	46.76
ıPıv	8,23,700	7,50,700	-73,000	8.86
Wj *	5,76,000	5,19,000	-57,000	10.00
`Zj *	4,11,395	1,52,295	-2,59,100	62.98
gkj v	3,10,750	3,02,000	-8750	2.82
řMj Avj y	13,85,060	13,84,000	-1060	0.80
Zřv	16,785	16,777	-8	0.05
kıKıwâ	12,61,929	11,98,000	-63,929	5.06
Pv	21,180	50,800	+ 29,620	58.30
cıU	4,85,004	9,17,986	+4,32,982	47.17
ZvgvK	34,917	36,000	+1,083	3.00

(Drm: Kul.WvBıı, 1996; ře.ře.Gm. 1994)

* Wj I `Zj i řřřřř 1991-92 mřbi cwi msL`vb ř`qv nřřřřř|

** cřqvRřb = Drcv`b + NvUıZ; řh cwiqvY cY` Avğ`vb ev iřvb Kiv nq ZvıvB NvUıZ ev DřřEj ř`Lvřbv nřřřřř|

Dcti i QK ntZ t`Lv hvq eivj vt`tk avb Drcbæq 183.41 j 97 Ub Ges c0qvRb 183.71 j 97 Ub| G intmte NvUwZi cwi gvY 30 nRvi Ub| Zte Lv` intmte avtbi (Prj) cwi etZ` Avgiv teik Kti Mg Avg`mb Kti _wK| t`tk eZ9vtb 11.76 j 97 Ub Mg Drcbæq Ges wef`k ntZ Avg`mb Kiv nq 10.33 j 97 Ub hv tgvU c0qvRtbi 47 kZvsk| t`tk Mtgi tgvU c0qvRb 22.09 j 97 Ub| t`tk wPibi c0qvRb c0q 8.24 j 97 Ub Ges Drcbæq c0q 7.51 j 97 Ub| c0qvRbxq evKx 73 nRvi Ub wPib wef`k ntZ Avg`mb Kti Af`šli xY Pwn`v tgvU tZ nq A_ P Pwn`vi c0q 81 kZvsk wPib Avgiv DrcbæKwi |

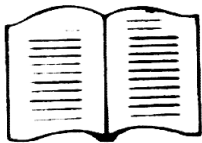
t`tk Wrtj i Drcv`b 5.19 j 97 Ub A_P Avgv`i c0qvRb 5.76 j 97 Ub| eZ9vtb t`tk Wrtj i NvUwZ 57 nRvi Ub| G NvUwZ tgvU c0qvRtbi 10 kZvsk| `Zj exR ntZ Avgiv th `Zj cvB (`Zj exR 33% `Zj ati intmte Kiv ntqtQ) Gi cwi gvY c0q 1.53 j 97 Ub| wKŠ` Avgv`i c0qvRb Gi tPtq AtbK teik A_ P c0q 4.12 j 97 Ub| `Ztj i NvUwZ 2.59 j 97 Ub hv Avgiv wef`k ntZ Avg`mb Kti _wK Ges Gi cwi gvY c0qvRtbi c0q 63 kZvsk| Avgv`i c0qvRbxq Kul.cY`i gta` `Ztj i NvUwZB mefPtq teik|

gkjv, tMj Avj ykvKmwâ BZ`w`i c0qvRb h_vµtg 3.12, 13.85 Ges 12.62 j 97 Ub Ges Avgv`i t`tk Gt`i Drcv`tbi cwi gvY h_vµtg 3.02, 13.84 Ges 11.98 j 97 Ub| th mKj Kul.cY` Drcv`tbi NvUwZ AvtQ tm,tjv Avg`mb Kti t`tki Af`šli xY Pwn`v tgvU tZ nq| c0qvRtbi Zjybvq wefbaeKul.cY`i NvUwZi cwi gvY kZKiv 0.05–62.98 fVM|

Prtqi evrmi K Drcv`b 50.8 nRvi Ub| G Drcv`b t`tk Af`šli xY Pwn`v wgvU tZ Avgiv 29.62 nRvi Ub wef`tk i Bmb Kti _wK hv tgvU Drcv`tbi 58.3 kZvsk|

Avgv`i me Kul.cY`i B th Drcv`tbi NvUwZ itqtQ Zv bq eis tKvb tKvb cY` Avgiv c0qvRtbi Zjybvq AtbK teik DrcbæKti _wK| G t97t1 Pr, cvU Ges Zvgv`Ki bvg DjtL Kiv thtZ cvti | Prtqi evrmi K Drcv`b 50.8 nRvi Ub| G Drcv`b t`tk Af`šli xY Pwn`v wgvU tZ Avgiv 29.62 nRvi Ub wef`tk i Bmb Kti _wK hv tgvU Drcv`tbi 58.3 kZvsk| t`tk cvtUi tgvU Drcv`b c0q 9.18 j 97 Ub Ges GLvb ntZ c0q 4.33 Ub wef`tk i Bmb Kiv ntq _vtK Ges GUV tgvU Drcv`tbi 47.17 kZvsk| eZ9vtb t`tk c0qvRtbi tPtq 1 nRvi Ub teik Zvgv`K Drcbæq|

Zvgv`Ki tgvU Drcv`b 36.00 nRvi Ub Ges c0qvRb 34.92 nRvi Ub| Drcw`Z AwZwi³ GK nRvi Ub Zvgv`K Avgiv wef`tk i Bmb Kti _wK hv tgvU Drcv`tbi wZb kZvsk| Drcw`Z Kul.cY`i gta` kZKiv intmte Pr-B Avgiv teik i Bmb Kti _wK| Af`šli xY Pwn`v wgvU tZ eZ9vtb Pr, cvU I Zvgv`Ki t97t1 D0tEji cwi gvY h_vµtg 58.3, 47.2 Ges 3 kZvsk |



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eivj vt`tki c0vb c0vb Kul.cY`i ntjv avb, Mg, wPib, Wvj, `Zj RvZxq km` (`Zj), gkjv, tMj Avj yZjv, kvKmwâ, Pr, cvU Ges Zvgv`K| Pr, cvU I Zvgv`K e`ZiZ Ab` me,tjv cY`B Gt`tk c0qvRtbi Zjybvq Kg Drcbæq| Pr, cvU I Zvgv`K Drcv`tbi t97t1 D0tEji cwi gvY h_vµtg 58.3, 47.2 Ges 3.0 kZvsk|



cvtVĖi gj`iqb 3.5

mivK DĖti i cvtk;UK vPy (√) ir b|

- 1| AvtMi Zjybq Kul.cY`i Drcv`bi cvi gvY Kx i Kg ?
 K. Ktgto L. tetoto
 M. v`vZkxj N. Lgy tenk Ktgub
- 2| AwaKusk Kul.cY`B Avgiv Kx Kwi ?
 K. i Bmb Kwi L. `vgrvZ Kti i ml
 M. Avg`mb Kwi N. Af`šlixY evRvti neplı Kwi
- 3| Avgv`i t`tk avtbi Drcv`b KZ j ¶| Ub ?
 K. 18.34 L. 18.37 M. 20.22 N. 20.57
- 4| cqvRtbi KZ kZvsk Mg Avgiv Avg`mb Kwi ?
 K. 62.98 L. 46.76 M. 58.3 N. 47.17
- 5| Af`šlixb Pvir`vi KZ kZvsk vPvb t`tk Drcbmq ?
 K. 77 L. 62 M. 82 N. 81
- 6| cqvRbxq Kul.cY`i tKvbU metPtq tenk Avg`mb Ki tZ nq ?
 K. avb L. Mg M. Wvj N. Zj
- 7| Drcv`Z Kul.cY`i kZKiv nvi intmte tKvbU tenk i Bmb Kwi ?
 K. Pv L. cvU M. ZvkvK N. avb



Pavšl gj'iqb

msiŋB I iPbvqj-K cĕæ

- 1| Kul.hmšĕKxKiY ej ĩZ Kx ejŠb ?
- 2| evsj vĕ ĩk ĩKvb aiĕYi hmšĕKxKiY cĕqvRb Ges ĩKb ?
- 3| evsj vĕ ĩk Kul.i ĩKvb ĩKvb ĩŋĕĕ hmšĕKxKiY mæe ?
- 4| evsj vĕ ĩk Kul.hmšĕKxKiĕYi cĕqvRbvqZv Avĕj vPbv Kiĕy|
- 5| gvV dmj Drcv ĩb Pvl I Rvq mgvb Kivi vewfbahšĕvzi bvg vj Lĕy |
- 6| nva-gjvMi Lvqvĕi vWg dĕvĕbvi hšĕvzi Zvuj Kv cĕZ Kiĕy|
- 7| grm Lvqvĕi e'euZ vewfbahšĕvzi bvg vj Lĕy|
- 8| vewfbahšĕvzi I eb'v vebqšĕy cĕĕĕi i bvg vj Lĕy Ges Mĕv KĕcvZvŋ cĕĕĕi i eYv v' b|
- 9| Dĕi eĕ Mfxi bj Kz cĕĕĕi i veei Y v' b|
- 10| th mKj cY' vĕ ĩk nĕZ Avg`vb Kiv nq Zvĕ' i GKvU Zvuj Kv cĕZ Kiĕy |
- 11| 1992-93 mĕb evsj vĕ ĩk cĕvb th cĕvU Kul.cY' Avg`vb Kĕĕĕi Zvi cwi gvY Dĕj ĕ Kiĕy |
- 12| cwi gvYmn 1992-93 mĕb i BvbKZ.cĕvb cĕvb cĕY'i bvg vj Lĕy |
- 13| evsj vĕ ĩk Lv' ĕm'i Drcv`b mĕšĕl RbK bq ĩKb?
- 14| evsj vĕ ĩk Lv' km' Drcv`ĕbi aviv Kx i Kg?
- 15| Af`šĕxY gŕ Rj vĕĕq gvĕQi cwi gvY Kĕg hvĕ'Q ĩKb?
- 16| ĩ ĩk gvsm, `ŕ I vWg Drcv`b evx'i Kivi Y Kx?
- 17| evsj vĕ ĩki cĕvb cĕvb Kul.cĕY'i bvg vj Lĕy |
- 18| evsj vĕ ĩk ĩKvb&cY' Kx cwi gvY Drcvĕq Zvi cwi gvY Dĕj ĕ Kiĕy|
- 19| evsj vĕ ĩk ĩKvb&cY' Kx cwi gvY cĕqvRb Zvi veei Y v' b|
- 20| evsj vĕ ĩk ĩKvb&cY' cĕqvRĕbi Zjvĕq KZ kZvsk NvUvZ ev Dĕĕ; Zvi Zvuj Kv v' b|



DĖi gij v

cW 3.1:

1| K 2| L 3| M 4| N 5| L 6| K 7| M

cW 3.2:

1| L 2| L 3| K 4| L 5| K 6| L

cW 3.3:

1| M 2| L 3| N 4| K 5| M 6| K

cW 3.4:

1| K 2| L 3| M 4| M 5| N 6| M

cW 3.5:

1| L 2| M 3| K 4| L 5| N 6| N 7| K

**BDibU 1
cwi tek I
Btkumt ÷ g**

BDibU 1 cwi tek I Btkumt ÷ g

cw₁ extZ cōZiU Rxei Rxeb aritYi Rb^o Piv chfß Lv^o, Dchÿ eim^ovb Ges^o Q
cwi cwiK^oRZv/ mÿg I cwi igZ Lv^o Qvov Rxeþi MuzgqZv thgb eRvq₁ vtK bv, tZgub
Dchÿ Avtjv-evZvm cwi gUJZ Ges^o r^om^oÿZ eim^ovb Qvovl Rxeþi Av^oZ; A₁ñb/
RxebþK mPj i vLvi Rb^o Gme WQb cZ^o¶ ev ctiv¶fite Rxei I ci uqvkvj | Avi G^oi
vbtqB Rxei cwi tek | mÿzivs mvari Yfvte cōZubqZ thme tFßZ i vmvqubK Ae^ov RxeKj þK
cf^omeZ Ki tQ ZvB n^oQ Rxei cwi tek |

cōg mKj cōKuzK cwi tekþK D^o¶ I cōYxþK GKw^ofZ n^oq eim Ki tZ t^oLv hvq | Awegk^a
Rxe wntmte eim Kivi cōYZv tbB ej þj B Pj | tKvb eim^ovb wewfbæcRmZi Rxiemþni
mgwōMZfvte Ae^ovþK Rxe-m^ou^ovq ej | GB Ae^ovþbi gra^otg Rxe-RMZ cwi tekþK Ges
cwi tek Rxe-RMZþK bvbvfvte cf^omeZ Ki tQ | mÿzivs Rxe I cwi tekþi m^oúK^oAZ^oš
vboeo |

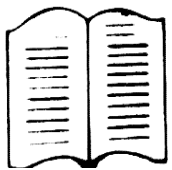
G BDibU cwi tek m^oúK^o avi Yv, cwi tekþi Dcv^ovb, Btkumt ÷ gi msÁv, D^o¶, cōYx I
Btkumt ÷ g, wewfbæaitþi Btkumt ÷ g, cwi tekþi Dci D^o¶ I ebrqþbi cf^ove, evsj vt^oþki
cwi tek b^ouz I cwi tekMZ Ae^ov, Ges evsj vt^oþki Kul. cwi tek AÁj mgþni cwi wPuz
m^oúK^oe^oñwi Z Avtj vPbv Kiv n^oq tQ |

cw 1.1 cwi tek m^oúK^o avi Yv, cwi tekþi Dcv^ovb



G cvl tkþl Avciob –

- ◆ cwi tek m^oúK^oej tZ cvi teb |
- ◆ cwi tek wéÁvþbi msÁv ej tZ I wj LtZ cvi teb |
- ◆ cwi tekþi Dcv^ovb m^oúK^oAvtj vPbv Ki tZ cvi teb |



cwi tekþi avi Yv

cwi tek K₁u euj fvte e^oüZ, thgbt mgw^oRK cwi tek, m^ov^ouzK cwi tek, w^o¶v^oþbi
cwi tek, i vR^okwZK cwi tek BZ^ow^o Avi I AtþK cwi tek | Zte cwi tek wéÁvþ Rxe
wéÁvþbiB GKw^o Atc^o¶vKZ. bZb I Av^oþKZg msKj b thLvþ Rxei m^ov^o Zvi
cwi cwiK^oRZv vbtq Avtj vPbv Kiv nq | wéÁvþbi th kvLv Rxei cwi cwiK^oRZvi m^ov^o RxeKj i
cōZiU cvi^o ñwi K uqv^o-wew^oqv vbtq w^okv fvte Avtj vPbv K^oi ZvB cwi tek wéÁvþ | cwi tekþi
m^ov^o cōYxRMZi m^oúK^ovbtq Avtj wPZ w^ovtK Btkij wR (Ecology) ej v nq |

wéÁvþbi th kvLv Rxei
cwi cwiK^oRZvi m^ov^o RxeKj i
cōZiU cvi^o ñwi K uqv^o-wew^oqv
vbtq w^okv fvte Avtj vPbv K^oi
ZvB cwi tek wéÁvþ |

wewfbæmg^otg wewfbæcwi tek wéÁvþ cwi tekþi bvbwea msÁv w^otg^oQb | hvi Drcw^oE I w^oñZ
e^ovck w^oavq^o t^o cwi m^oi Avtj vPbv m^oe bq | Zte euj cōv^oj Z I mg^ov^o Z KtqKw^o msÁv
GLvþb t^o I qv tMj |

cwi tek wéÁvþbi msÁv

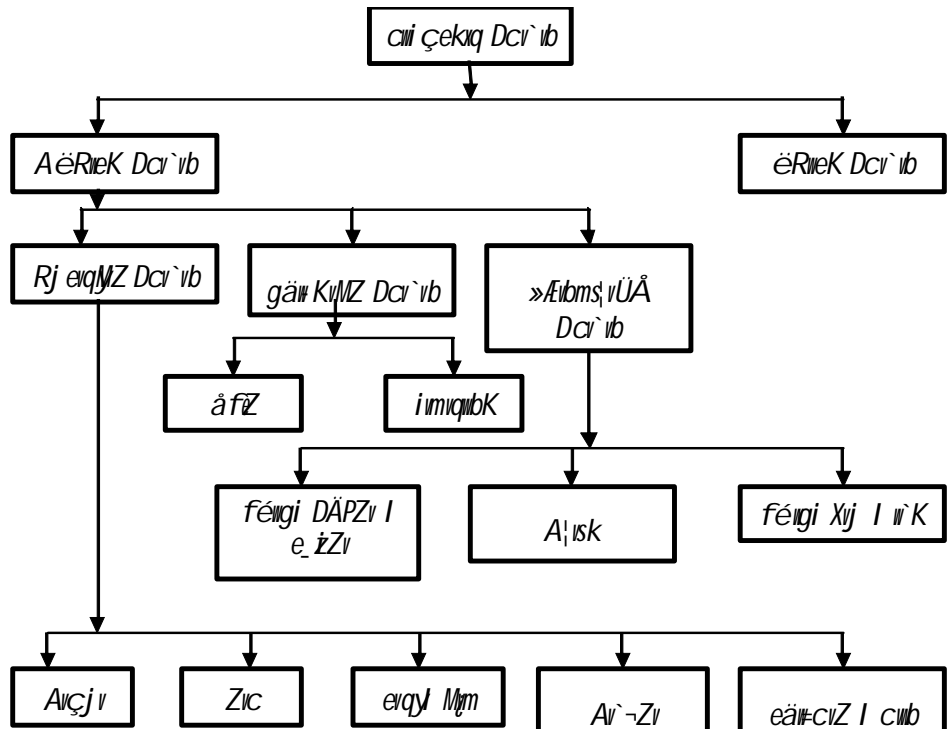
- (1) 'Re I A%Re cwi tetki mvt_ c0Yxi Abmej m=úK#KB cwi tek neÁvb etj, — **tn#Kj, 1869** |
- (2) cwi tetki mvt_ Rxei m=úK@btq th neÁvb AbyÜvb Pjy vq ZvB cwi tek neÁvb | GiU Ávtbi Ggb GKUW `k0 thLvfb RxeRMZ#K c0KwZK c0µqvi Avtj vtK e'vL'v Kiv nq — **DWewi, 1955** |
- (3) RxeK tji c0Pz® I we'li m=úuKZ mybw'ó MtelYvB cwi tek neÁvb — **GiÜqy_®, 1961** |
- (4) cwi tek neÁvb nt"Q cwi tetki Avštµµqwi i Aa"qb hv Rxei we'li, Drcv`b c0Pz® Avfe"v³ ubqšy Kti Ges gljz mrvab Kti — **tcUWm, 1968** |
- (5) cKwzi MVb I Kvhfej x m=útK®Aa"qbB nt"Q cwi tek neÁvb — **I Wvg, 1971** |
- (6) Rxei c0Pz® eÈb ubYqKvi x Avštµµqwi i neÁvbwfvE K ch#j vPbvB nt"Q cwi tek neÁvb — **tµe, 1972** |

Avgt`i Pvi cvtk hv wKQ
AvtQ Ges hv wKQ# Avgt`i
RxebavtK cZ`¶ ev
ctiv¶fvte cfmEZ Kti ZvB
Avgt`i cwi tek |

Dctiv³ msÁv_ tji mvi mst¶c Kij hv `wvq Zv nt"Q, Avgt`i Pvi cvtk hv wKQyAvtQ Ges hv wKQ# Avgt`i RxebavtK cZ`¶ ev ctiv¶fvte cfmEZ Kti ZvB Avgt`i cwi tek |

cwi tetki Dcv`vb

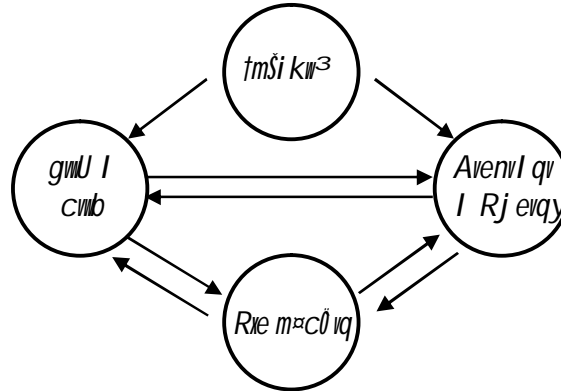
mvari Yfvte cwi tek ej tZ Rxei cwi cvk# Ae`vtKB ešvq | Zte cwi tek Avtj GKU RvUj cxwZ hv eúnea Dcv`vtbi mgwó ubtq MwZ | ewv"K th mKj e'`ev Dcv`vb RxeK wNti ti tL#Q Ges hv RxeK Zvi weKvk I we`ti cfmEZ Kti ZvB cwi tetki Dcv`vb | GB Dcv`vb_ tji mRxe I Ro DfqneaB ntZ cvti | cwi tetki tgšij K Dcv`vbmgn#K cieZx` c0vq Q#K t`Lvfbv ntj v |



cwi tetki tKvb GKwU
Dcr`vtbi Zvi Zg` NUtj
Ab` Dcr`vtbi mqvKvUI
ZvOvi v cfwEZ nq|

cwi tetki Dcr`vbmgtai Avstmuqv

cOkuzK cwi tetk mekl tKvb GKK Dcr`vtbi tPtq Dcr`vbmgtai mgwMZ cfw Rktei Dci tek Ae`vb ivtL| Gi KviY GB th, Dcr`vb,tjv ci`uti i mt_ I ZtcUZ fite mu³| cwi tetki tKvb GKwU Dcr`vtbi Zvi Zg` NUtj Ab` Dcr`vtbi mqvKvUI ZvOvi v cfwEZ nq| cwi tek meAvtbi fvlvq hv Holocoenotic cfw eej LvZ| thgbt mhaj vtKi cLi Zv evotj Dv`i c⁻^b nvi evx cvq| c⁻^b nvi evotj mecvKxq KvR cfwEZ nq BZ`w` |



uP⁻ 1.1 -1: cwi tetki Dcr`vbmgtai Avstmuqv

mevfbocwi tek meAvb cwi tetki Dcr`vbmZ tkvYmeb`vm mevfbvite w`tq _vKtj I AwaKvstki gtZ Pvi uU fvtMi Dci B clavb` t`qv ntq _vtK|

1| **Rj evqYZ Dcr`vb**

(K) **Avtj v t G** cvu extZ cZ`q| ev ctivq| fite RiebK KvhRi ivLvi Rb` mKj kw³i Dv m tmSi kw³| meR Dv`c cI` tKv i v d t j i m v n t h` th cluqvi gva`tg Avtj v Kkw³ tkvY Kti i v m v q u b K kw³ t Z cwi YZ Kti Ges kKvRvZxq Lv` Drcr`b Kti ZvtK mtj v K-mstkd Y etj |

meR Dv`c cI`
tKv i v d t j i m v n t h` th
cluqvi gva`tg Avtj v Kkw³
tkvY Kti i v m v q u b K kw³ t Z
cwi YZ Kti Ges kKvRvZxq
Lv` Drcr`b Kti ZvtK
mtj v K-mstkd Y etj |



tkv i v d i
mtj v K-mstkd Y mevRZ Dv`i Av`Z; thgb Kíbv Kiv hvq bv, tZgub Dv`c Qvov Ab` cOYxi Rieb avi Yl clq Ame| Avi GmeB nt`Q Avtj v K kw³i cY`mbqstY| mtj v K-mstkd-Y Qvovl Dv`i MVb, AvKwZ, cI`meb`vm, cvZvi cyz; tKv i v d t j i cwi gvY, c⁻^b, cY`uqb Ges Avi I eUna` RieK KvhRj x Avtj v Ovi v msNuZ ev cfwEZ nq| cvu extZ cvZZ Avtj v K i v k h` ZieZv I`vqxZ; FZ`f, Aqjusk, fugi Xvj I w`K, evqgU t j i` QZv, Av`Zv, Kqvkv, tgN BZ`w` DcKi Y Ovi v cfwEZ nq| th mKj Dv`c Zie³ Avtj v Z fuj Rtb` (thgbt avb, cvU, Mg, Avg, Zjv BZ`w`) Zvt` i tK **Avtj v cO` Kvi Dv`c** ev **tnuj I dBU** etj | Avevi th mKj Dv`c Qvqv` vtB Rb`btv cO` Kti (thgbt dvY`cvb, etbi v`e`i i j Zv, j Y BZ`w`) Zvt` i tK **Qvqv cO` Kvi Dv`c** ev **mBI dBUm** etj |

tetP _vKvi Rb" mKj
 Dm"t`i GKUW mtePP kmY
 (Maximum), cwiugZ
 (Optimum) I mebb³
 (Minimum) ZvcgvIv
 itqtQ, hvfK **KuWbuj**
ZvcgvIv ejv nq/

(L) **ZvcgvIv t Dm"t`i** epX I meKvK ZvcgvIv AZ"sl, iZcy³figKv cij b Kti _vtK| mKj mecvKxq Kvhpig, thgbt mtj vK-mstkdY, kmb, cwi tkvLY, A¹/₂zi v Mg, c⁰-^b, Awfmeb BZ"ww cwi tekxq ZvcgvIv 0v v ubqwsZ| ZvcgvIv Kg ev teik ntj mecvKxq Kvhpig xi Dci Zvr³qWYK cZ³muqv t Lv t`q| tetP _vKvi Rb" mKj Dm"t`i GKUW mtePP kmY (Maximum), cwiugZ (Optimum) I mebb³ (Minimum) ZvcgvIv itqtQ, hvfK **KuWbuj ZvcgvIv** ejv nq| tKvb Avevm`tj Dm"t`i me`lz Zvi KuWbuj Zvc 0v v ubqwsZ| thgbt avb MtQi AwfthvRb mtePP 40° tm. Ges mebb³ 5° tm. ZvcgvIvi gta" mvgvex wKs' cwiugZ ev Abkj ZvcgvIv 20-30° tm. Gi gta" ZvB Dm"t`i tft³Muj K me`lz ZvcgvIvi Dci euj vstK wbfPkj| ZvcgvIvi Zvi Ztg`i Dci wbfP Kti Dm"t` mg ntK PviuW tkWytZ fivM Kiv hvq t

- (1) **tgMv³vg** th mKj Dm"t` AwZ D`P ZvcgvIv m³ub³AA`tj RbWq|
- (2) **tgtmv³vg**- Giv gj-Z Dò c³vb AA`tj i Dm"t` | Zte evrmiK FZzft` Atc³qvKZ.Kg DòZvI mn" Ki tZ cvti |
- (3) **gvBt³vg**- Giv bwiZkxtZvò AA`tj i Dm"t` etj eQtii teiki fivM mgqB Atc³qvKZ Kg DòZvI mn" Ki tZ cvti |
- (4) **tnuKt³v³vg** Giv tgiyAA`tj i Dm"t`, mvi v eQi ub³reZvcgvIv mnbkxj |



Abkxj b (Activity) t Avtjv I ZvcgvIvi Dci wfmE Kti Dm"t` i tkWYweb`vm Kily| Avcbri cwi wPZ Dm"t` tjt vtK Duj mLZ tkWYweb`vfm wef³ Kily|

evqjZ Aew`Z CO₂ M`im
 Dm"t`i mtj vK-mstkdY i
 Rb" AwZ c³qvRbxq Dcv`vb|
 Zte Gi gvIwZwi³ epX Mib
 nivDR cZ³muqv NUvtbri Rb"
 vqx|

(M) **evqyt** evqyc³evn cZ"q I ctiv³qfite Dm"t`i epX I me`lz c³fwieZ Kti| AtbK Dm"t`i exR GK`vb ntZ Ab"v`tb evqy0v v `vbs³li Z ntq Dm"t`i esk me`li NUvq| eù Dm"t`i civiMqY evqjy gva`tg ntq _vtK| g³evqjZ Dm"t`i c⁰-^b nri Kg| wKs' c³ej evqjZ Zv epX tctq Dm"t`i cwibi Pwv`v ewotq tZvtj | c³ej evqy0v v msNuUZ RuUj Zvi gta" itqtQ Dm"t`i AvKuZMZ meKwZ, tft³/₂ cov, NI³P³RibZ qWZmvab, fig³q BZ"ww | G Qrov eù tivtMi RxeYevqy³mnZ ntq Dm"t` I c³Yxi tivtMi KviY NUvq| evqjZ Aew`Z CO₂ M`im Dm"t`i mtj vK-mstkdY i Rb" AwZ c³qvRbxq Dcv`vb| Zte Gi gvIwZwi³ epX Mib nivDR cZ³muqv NUvtbri Rb" vqx|

(N) **evqjy Av`Zv t** evqjy Rjxq Av`ZvtK Avtcv³qK Av`Zv wntmte cKvk Kiv nq| tKvb evqjZ Aew`Z Rjxq-evt³ú i eZ³vb Ae`v Ges GKB evqym³ú³ ntj KZUkzRjxq ev³ú aviY qWZv ivtL Zvi AbqvZtK Avtcv³qK Av`Zv etj | Avtcv³qK Av`Zv kZKiv wntmte cKvk Kiv nq| evqy0tj i DòZv Kg-teiki mtj Avtcv³qK Av`ZvI Kg-teik nq| DòZv evotj Avtcv³qK Av`Zv Ktg| Avevi DòZv Kgtj Avtcv³qK Av`Zv epX cvq|

Avtcv³qK Av`Zv Dm"t`i
 c⁰-^b nri ubqšY Kti etj
 tKvb& AA`tj Kx ai`bi Dm"t`
 RbWte Zv tm AA`tj i Avtcv³qK
 Av`Zvi I ci euj vstK
 wbfPkj |

Avtcv³qK Av`Zv Dm"t`i c⁰-^b nri ubqšY Kti etj tKvb&AA`tj Kx ai`bi Dm"t` RbWte Zv tm AA`tj i Avtcv³qK Av`Zvi Dci euj vstK wbfPkj | AtbK Dm"t` AvtQ hviv i³ AvenvI qvq mste`bkxj wKs' Av`³AvenvI qvq mn³tRB RbWtZ cvti | Gt` itK **mBtMchBUM** etj | thgbt iv`te tXwKkvK BZ"ww |

(0) **epocvZ I cwb t Dwt`c** Rxeft cwnbi , iZ; Acwixg| Dwt`c i kvixieFxiq hveZixq KvhFg cwnbi gva`tgB msNiuZ nq| cwb mtvj vK-mstkdY c`uqv Ab`Zg Dcv`vb| cwnbi AeZgvtb Dwt`c i Lv` Drcv`b c`uqv Pj tZ cvti bv| Avi Lv` Drcv`b Qvov Dwt`c i tetP_vKvi K_vB fiev hvq bv| GKvi tYB cwi tekixq Ab`vb` Dcv`vb Atc`qv fct`o Dwt`c we`fti i t`q`i cwnbi Zvrch`A`bK tenk|

tKvb `vtb Dwt`c i aib, weKvk, we`lz, BZ`w` ubfP Kti tm AA`tj epocvZ I cwnbi clc`Zvi lci|

tKvb `vtb Dwt`c i aib, weKvk, we`lz, BZ`w` ubfP Kti tm AA`tj epocvZ I cwnbi clc`Zvi Dci| Avevi tKvb GjvKvq epocvZi cwi gvY ubfP Kti A`bKuv D³ GjvKv mvti i KZUv ubKueZ, mvti t`tk fugi w`tk c`vwnZ evqj MvZavv, evqjZ Rjixq evt`ui c`p`zv, A`qvsk BZ`w` i Dci| ubi`qv AA`tj epocvZi cwi gvY me`aK, c`qvsti tgi`A`tj i epocvZ me`b`p`

Dwt`c evm`vtb epocvZi cwi gvY I cwnbi clc`Zvi Dci ubfP Kti Dwt`c tK PviuU c`vb tkiv`Z wef³ Kiv hvq t

(1) **RjR Dwt`c (Hydrophytes)** t th mKj Dwt`c RjR cwi tetk AvsukK ev me mgq RweKv ubefn Kti Zvt`i`K **RjR Dwt`c** etj| Giv ubgvi`Z ev fvmgub, g` ev t`v`ive`x n`Z cvti, thgt KP`zcvb, nvBm`jv, tkIjv, kvcjv BZ`w` | DfPi Dwt`c I RjR Dwt`c i tMv`TB cto, thgt Kjgx kvK G`i gj-KvU m`v`vZ bq| Avf`m`b PvcI Lv Kg|

(2) **maviY Dwt`c (Mesophytes)** t th mKj Dwt`c gvUtZ cwi`gZ cwb_vKv Ae`vq Rtb` Zvt`i`K **maviY Dwt`c** etj| G`i Rxeb avit`Yi Rb` c`p` epocvZ I bmvZkx`Zv` Rjevqj c`qvRb| G`i Rb` Rjve`xZv I jeYv³Zv tKv`v`v mnbxq bq, thgt Mg, mviLv, Avg, Rvg, Kv`vj BZ`w` | G`i gj-, KvU, kvLv-c`kvLv m`v`vZ| Avf`thvRb Pvc `v`f`meK|

(3) **giR Dwt`c (Xerophytes)** t th mKj Dwt`c i`c gvUtZ A`ev Lv Kg epocvZ m`ub`e AA`tj Rtb` Zvt`i`K **giR Dwt`c** etj| Kg epocvZm`ub`eGjvKvq Rtb` etj Avakisk t`q`i`B G`i cvZv, KvU, gj-, Af`si`xY I kvixieFxiq t`q`i` c`p` i/cv`sti n`q_v`K| G`i D`vniY n`q` - d`v`gbmv, K`vKvum, Kiwe, tLRj, SvD, N`Z Kgvix BZ`w` |

tRvqv fivv metaS`Z mgy ZxieZ`P G aitbi Dwt`c tK gvUtM`f Dwt`c etj, thgt ersj vt`ki `v`Yv`A`tj my`ietbi my`ix, Movb, tMIqv, tMj cvZv BZ`w` |

(4) **tjvov gvUli Dwt`c (Halophytes)** t th mKj Dwt`c jeYv³ cwb ev gvUtZ Rtb` Zvt`i`K **tjvov gvUli Dwt`c** etj| G mKj Dwt`c i cvZv c`qB imvtjv Ges f`M`v`g`-t`tk gvUli Dcti Lvorfite k`m-gj- t`Lv hvq| Avakisk t`q`i`B RivqjR-A`v`zi`v` Mg N`U Ges D`P Avf`m`b Pvc we`gvb| tRvqv fivv metaS`Z mgy` ZxieZ`P G aitbi Dwt`c tK **gvUtM`f Dwt`c** etj, thgt ersj vt`ki `v`Yv`A`tj my`ietbi my`ix, Movb, tMIqv, tMj cvZv BZ`w` |



Abyj b (Activity) t cwnbi jet`Yi Dciv`wZ Abyvqx ersj vt`ki A`%omZKfite , i azc`v` Dwt`c mgn`K tkiv`web`vm Ki ab|

2| **gv`KvMZ Dcv`vb**

cwi tetki gwEKvMZ Dcv`vbi gta` itqtQ gwLi tfsZ I imvqubK „Yvej x| gwLi Mvb, eby BZ`w` tfsZ „Yvej x Ges gwLi A=Z; ¶vi Zi; jeYv³Zv, Lv` Dcv`vb BZ`w` imvqubK Dcv`vb Øviv Dw`m` i eaB, meKik I we`bz euj fite cfwmeZ| gwLi cwb avi Y¶gZv Zvi tfsZ „Yvej xi Dci wbf¶kxj | Acict¶¶ Dw`m` i Lv` mieivtni cwi gvY gwLi imvqubK „Yvej xi Dci wbf¶kxj | ZvB me gwUtZB me Dw`m` fij Rtb¶bv thgbt fwi gwU avb P¶tli Rb` Dc¶hVlx, Aci w`tk nij Kv t`v-Atk gwU AvL, Mg, mwi Lv, BZ`w` P¶tli Rb` Dch¶ etj we¶ewPZ|

3/ `vb mspvšDcv`vb

`vb mspvšDcv`vbi gta` itqtQ

(K) figi D`PZv I eÜzZv

(L) A¶vsk Ges

(M) figi Xij I w`K|

(K) **figi D`PZv I eÜzZv t** mimi-cp t`tk fig KZ D`PZvq Aew`Z A`ev figi Dcwi fvtmi eÜyZvi aib Dw`m` Rieb¶K cfwmeZ Kti | Kvi Y G Øviv Avtjv I cwb ctc`Zv Ges `vbxq Rj evqyeuj istk wbf¶kxj |

(L) **A¶vsk t A¶vstki** Ae`vb, `vbxq Rj evqyZv cvv¶v, ewpöciz, Avtjvi cwi gvY BZ`w` Avenl qvMZ Dcv`vbi wbf`RK Ges GmevKQØviv B Dw`m` I cØYx we`li cfwmeZ nq| c¶_exi wbaeA¶vstki giyAAj D`P Zvc I cwb AFvte Dw`m` I cØYxi emevtmi Abg¶thvMx| Averi D`P A¶vstki tgiyAAj Zxe³kxZ I eidRwbZ Kvi¶Y emevtmi Abg¶thvMx|

(M) **figi Xij I w`K t** figi Xij I w`tki cfwme Dw`m` I cØYxi Dci tewk Ab¶Z nq ga` I D`P A¶vstki| wbaeA¶vstki Gi tZgb tkvb cfwme cwi jw¶Z nq bv| Kvi Y mh¶mri v ermi B GLv¶b j`fvte wKi Y w`tq `vtK| figi Xvtj i gv¶v GLv¶b „i¶cy, Kvi Y Xvtj i cwi gvY tewk Lvov ntj cwb avi Y ¶gZv nvm cvq| dtj Zv Dw`m` Rb¶t¶bvi Rb` Ab¶j-bq|

`RieK Dcv`vb

RieKtj i gta` cvi `umi K m`utK¶ cfwetKB `RieK Kvi Y etj | cwi tekxq `wotKvY t`tk mKj cØYvB cÜ`¶ ev ctiv¶fvte G¶K A¶b`i Dci wbf¶kxj | me¶ Dw`m` Lv` cÜZ c¶µqv evqy th CO₂ MhY Kti Zv cØYxi kmbRvZ| c¶vš¶ti cØYx wbtkt¶mi mvt` th O₂ MhY Kti Zv Dw`m` i mvtjvK-mstK-IY c¶µqv DcRvZ| c¶kuztZ Dw`m` KZ¶ e`eüZ bivBtU¶RbNvUZ Lv` e`vKtUvqv I bixvf-me¶ `kev j Øviv gwUtZ avi YKZ| ZvQvov RieKtj i gta` itqtQ m`ut`i Rb` cÜZthvMZv, wgt`vRvexZv, ci RvexZv, civk¶vZv, BZ`w` i gtZv Avi I A¶bK µµqv Kg¶v Rie m`utK¶ Dcv`vbi B Askw¶tK|

cvtVēi gj`vqb 1.1

mivK DEti i cvtk wUK wPy (✓) w`b|



- 1/ cW_eitZ mKj kwi³ i Dm Kx?
 K) tmsi kwi³
 L) Zvc kwi³
 M) we`yr kwi³
 N) evqykwi³

- 2/ Dwi^m th cW_uqvq kK³RvZxq Lv` Drcv`b Kfi Zvi big Kx?
 K) kmb
 L) tkvIY
 M) mtj vK-msfk-IY
 N) Awfmèb

- 3/ th mKj Dwi^m Zxe^aAvtj vtZ RtbZvt` i Kx etj ?
 K) nvBtMödvBUM
 L) tnwj I dvBUM
 M) tnj vdvBUM
 N) mvBtqv dvBUM

- 4/ th mKj Dwi^m D`P ZvcgvIvq RtbZvt` i Kx etj ?
 K) tnwkt÷v_vg[©]
 L) gvBtµv_vg[©]
 M) tgtmv_vg[©]
 N) tglv_vg[©]

- 5/ evqj DöZv evotj Av`Zvi Kx cwi eZ⁸ nq?
 K) nwm cvq
 L) ewx cvq
 M) tKvb cwi eZ⁸ NtU bv
 N) nwm ewx `öUvB NtU

- 6/ gi R Dwi^m i D`vni Y tKvbU?
 K) nvBwvj v
 L) my ix
 M) Avg
 N) K`vKUvm

- 7/ D`P A⁷istk Ritei emem cWZKj- nevi Kvi Y Kx?
 K) D`P ZvcI cmbi Afie
 L) Zxe^akxZ I eid
 M) cPz ewöcvZ I eb`v
 N) fugi eÜzZv I Xvj

- 8/ gwUj cmb avi Y 7lgZv Kxtmi Dci nbffkxj ?
 K) tfšZ ,Yvej.xi Dci
 L) A⁷Zji Dci

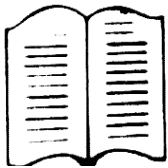
- M) i v m v q u b K , Y v e j x i D c i
- N) D i r m t i L v m i e i v t n i D c i

civ 1.2 Btkumt ÷ tgi msAv, Dirmt, cux I Btkumt ÷ g



G civ tkil Avci b –

- ◆ Btkumt ÷ g Kx Zv ej tZ I wj LtZ cvi teb |
- ◆ Btkumt ÷ tgi Kv h e x u Z I D c v v b m u t K e Y b v K i t Z c v i t e b |
- ◆ L v m - m k K j , L v m - R v j I L v m i c i w g W m u t K a v i Y v w t Z c v i t e b |
- ◆ Btkumt ÷ tgi , i x j Z t j a i t Z c v i t e b |



tKvb RxeB civ ex tZ Awengk^a Ae^viq evm Kitz cvi¹ b | cUg mKj RxeB GKw¹ tK Zvi
 cvi tek Ab¹ r tK Ab¹ v b R x t e i m t _ m j b w t m u t K e R v q t i t L P t j | w e i f b a e R v t Z i R x t e i
 G i f c m g u o M Z e m e v m i x u Z t K **Rxe-m-cUg** (Community) e t j | A v e r i R x e - m u v q G e s
 A % R e c v i t e t k i g t a A v S t i m u q v - w e i m u q v t h i v G K u W A w e t Q " " Z S j e i k o m i j o n q h i v b i g
Btkumt ÷ g | G . u R . t U b m i j (1 9 3 5) b v t g G K R b e i j k c v i t e k w e A v b x c U g G B k a i U
 e e n v i K t i b | c t i m k v t P f b v g K G K R b i j c v i t e k w e A v b x G i e v L v c U v b K t i b |
 Btkumt ÷ g n t Q G K u W M u Z g q c x u Z t h L v t b R x e I R o D c v v t b i g t a c U Z i b q Z m u q v -
 w e i m u q v i g v a t g Z i t i M V b I K v t h P c v i e Z b N U t Q |

Btkumt ÷ tgi msAv

Rxe I Zvi cvi tek w b t R t i
 g t a Ges ci u t i i g t a m u q v -
 w e i m u q v i c x u Z t K B t k u m t ÷ g
 e t j |

B. uc. I Wtgi gtZ, Btkvmt÷g ej tZ Rxe, ckwZ I Zvt`i AvbywK Dcv`vb,tjvi gta`
cvi`úvi K meqvvi gj- KihRi GKktK eSvq| wKŠ, Gm. gv_vfivb (1974) Gi gtZ, Rxe I
Zvi cwi tek wtrt`i gta` Ges ci`úti i gta` wqv-meqvvi c×wZtk Btkvmt÷g etj |

Btkvmt÷tgi Kihc×wZ

Btkvmt÷tgi Dw`c, cØx I Zvt`i cwi tek i gta` cØZwbqZ m=ú` mjo I wewbgq NUtQ| GB
cØwqtk m=ú` i AveZB (Cycling of materials) etj | GB AveZB cØwqv mKj kw³i
Drm mh⁹ GKgvI meR Dw`c tmsi kw³tk i vqvwbK kw³tZ cwi YZ Ki tZ mQg| Gfite
mwÁZ kw³ Lv` wntmte GK Rxe t`tk Ab` Rxe vbršli nq Ges tmLvb t`tk Avei Ab`
Rxe vbršli Z ntZ v`tk| cØZw Lv` vbršli i arcTK Lv` t`i (Trophic level) etj |
GB vbršli cØwqv cØZw t`i B Aek` wKQy kw³i AcPq NtU| GB mgM c×wZi bvg
kw³i cØm (Flow of energy)| Btkvmt÷tgi Rxe I Rtoi gta` kw³ cØm engvb vKvq
GtK MwZkxj etj gtb Kiv nq|

AtUwtdK ev t`fvrh hvi v
wtrt`i Lv` wtrivB
DrcbæKi tZ mg⁹ thgbt
meR Dw`c | Avei
Ab`w`tk AvtQ **wUti wtdK**
ev **citfvR** hvi Lv`
Drcv`b Ki tZ cvi bv etj
Lv`i Rb` cØ`Q ev
civQfite Dw`c i I ci
wfpkxj, thgbt gvbymn
Ab`v` mKj cØx|

Btkvmt÷tgi Dcv`vb

KvhØwvj i w`K wetePbvq Btkvmt÷tgi Dcv`vb mg ntK` ØfvM fM Kiv ntq v`tk| Gi
GK w`tk itqtQ **AtUwtdK** ev t`fvrh hvi wtrt`i Lv` wtrivB DrcbæKi tZ mg⁹ thgbt
meR Dw`c | Avei Ab`w`tk AvtQ **wUti wtdK** ev **citfvR** hvi Lv` Drcv`b Ki tZ cvi bv
etj Lv`i Rb` cØ`Q ev civQfite Dw`c i Dci wfpkxj, thgbt gvbymn Ab`v` mKj
cØx| wKŠ MVBMZ w`K wetePbvq Btkvmt÷tgi Dcv`vb wj`tk Ro I`RweK Dcv`vb wntmte
wetePbv Kiv Awak hys`hys`|

1/ **Ro Dcv`vb** (Abiotic components)

Btkvmt÷tgi Ro Dcv`vb,tjvi mvavi YZ` Øaitbi ntq v`tk| Gi GKw`tk itqtQ
gwiU, cwib, Lv`, KveØ-WvB-A·vBW, bvBtU`Rb, dmdim, cfwZ. tgšij K I thšM
`è`mgr Ges Ab`w`tk itqtQ Avtjv, Zvc BZ`w` kw³mgr| G⁹wj Dw`c Øviv MpxZ
nq Ges mh⁹jt`ki mrvth` Lv` i fcvšli Z nq| Avei Qz`Qz` AYRxei mrvth`
gZ Dw`c I cØxi t`n cØtbi dtj cØvqv gwiU I evqšÚtj wdti AvtM| GB
cØwqtk **Rie-f, i vqvwbK Pp** (Biogeochemical cycle) ejv nq| Zte cØZw
Dcv`vbi B wR`^ewkó` itqtQ Ges vrb-Kvj t`f` cwi eZØkij hv Rxei cØp`I
w`kZtk cfwZ Kti |

2/ **RweK Dcv`vb** (Biotic components)

cwi tek i RweK Dcv`vb mgr`tk Priw cØvb Astk fM Kiv hvq, Giv nt`Q Drcv`K,
Lv`K, wetaRK I i fcvšli K|

(K) **Drcv`K** (Producers)

Giv mvavi Yfite wtrt`i Lv` wtriv Drcv`b Ki tZ cvi | GRb` G`ti tK
ejv nq t`fvrh (Autotrophs)| meR Dw`c cT` tKv`i wdtj i mrvth` tmsi
kw³tk cwib I KveØ-WvB-A·vBW hvtM i vqvwbK kw³tZ cwi YZ Kti `Re
Lv` Drcv`b Kti | GB Lv` Dw`c wtr e`eni Kti Ges Ab`w` i Lv`i

thwmb t`q| meR Dwmc Qvovl wKQyKtgvmbt_wJK e`vKtUmi qv Ges te, wb is-Gi K`vti wUbh9 e`vKtUmi qv mh@jvK I thSMK c`vt_P Dciv`wZtZ wbtRt`i Lv` wbtRiv cOZ KitZ cvti | GRb` Gt`itKI cOugK Drcv`K wntmte wetePbv Kiv nq|

(L) **Lv`K (Consumers)**

th mKj Rxe wbtRt`i Lv` wbtRiv cOZ KitZ cvti br eis Lv`i Rb` cO`q ev ctiv`fite Drcv`Ki Ici wbfPkj Zvt`itK Lv`K etj |

th mKj Rxe wbtRt`i Lv` wbtRiv cOZ KitZ cvti br eis Lv`i Rb` cO`q ev ctiv`fite Drcv`Ki Dci wbfPkj Zvt`itK Lv`K etj | th mKj cOYx GKgvI Dwmc`tKB Lv` wntmte MhY Kti Zvt`itK **cOugK Lv`K** etj | thgbt dnos, cRvcwZ, KxU-cZ½, Miy gwl, QwMj, tfoi, nwiY, LiMk BZ`w | Avevi wKQycOYx AvtQ hviv miwmi Lv` wntmte Dwmc` MhY br Kti ZYt`fivRx cOYt`i Lv` wntmte MhY Kti Rxeb aviY Kti | tmBRb` Gt`itK **wZx chqj Lv`K** ev **tMSY Lv`K** wntmte wetePbv Kiv nq| thgbt e`vO, mvc, KivK, wPj BZ`w` cOYx | Avevi wKQyKQygvsmvKx cOYx AvtQ hviv Ab` cOYxKZR. Lv`i`fc MpxZ nq br| Gt`itK **mtP Lv`K** wntmte wetePbv Kiv nq, thgbt evN, wmsn, evRcmL, Kugi, ni½i BZ`w |

wKQyKQycOYx AvtQ hviv Aek` Dwmc` I cOYx DfqtKB Lv` wntmte MhY Kti Rxeb aviY Kti _vtK| Gt`itK ejv nq **mePK cOYx (Omnivorous)**, thgbt gvby|

(M) **wetqRK (Decomposers)**

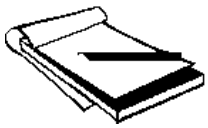
th mKj AYRxe gZ Rxe`tn Aew`Z `Re c`v_wj`tk avtc avtc tft½ mij c`vt_`ifcvšii Z Kti Zvt`itK wetqRK etj |

th mKj AYRxe gZ Rxe`tn Aew`Z `Re c`v_wj`tk avtc avtc tft½ mij c`vt_`ifcvšii Z Kti Zvt`itK wetqRK etj | QIvK I e`vKtUmi qv wetqRt`Ki chqfZ | Gt`i c`fiteB cOYt`tni `Re c`v_wj` Dwmc`i MhY DcthwMx A`Re c`vt_`ifcvšii Z nq| wetqRKt`itK AtbK mgq Lv`K wntmte| wetePbv Kiv nq| tKbbv `Re c`v_`K mij c`vt_`cwiYZ Kivi mgq Giv `Re c`v_`q`tk kv³ mAq Kti _vtK|

(N) **ifcvšik (Transformers)**

th mKj e`vKtUmi qv cPbi dtj Drcbæ`i Ici wqviv Øviv tm_wj`tk `Re I A`Re c`vt_`ifcvšii Z Kti Zvt`itK **ifcvšik** ev **Uydigvi** etj |

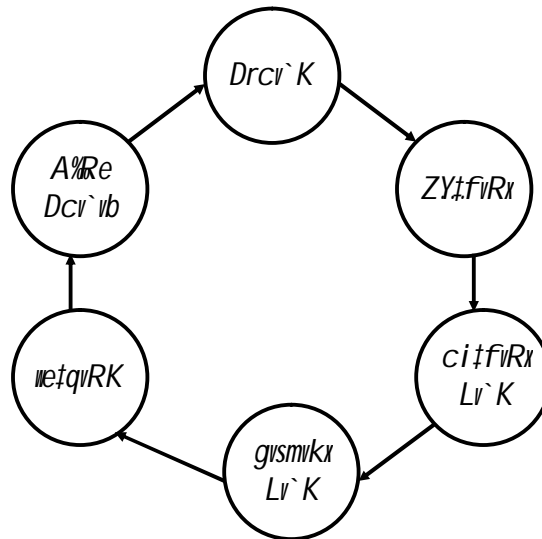
th mKj e`vKtUmi qv cPbi dtj Drcbæ`i Dci wqviv Øviv tm_wj`tk `Re I A`Re c`vt_`ifcvšii Z Kti Zvt`itK **ifcvšik** ev **Uydigvi** etj | wetqRK I Uydigvi _tjv BtKwmt`-tgi MwZgqZv eRiq ivLvi t`q`I AZ`šI , iYcY` fvgKv cij b Kti _vtK| Gt`i wqviv-Ktgp` dtj B `Re I A`Re Dcv`vbmgr `Re-f_i vmiqvBK P`µi gva`tg Aw` Ae`v`tb wdti hvq| Ab`_vq, c`exi mKj BtKwmt`-gB gZ `Re Dcv`v`bi AwatK` emevtmi AthvM` ntq thZ|



Abyj b (Activity) t BtKwmt`-tgi Ro Dcv`vb I `RieK Dcv`v`bi cv`R`mgr wj wcx Kib|

Lv`-wKj (Food chain)

cKwZtZ GKgvI meB Dw^mc B wbtRt`i Lv` wbtRiv`Zwi KitZ cvti A₀ Zviv`tfvRx| Ab`me RxeK Lv`i Rb` cL`q ev ctivqfvte Dw^mc`i DciB wbfP KitZ nq| Dw^mc th Lv` Zwi Kti Zvi wKQyAsk wbtRi cQvRtb e`q Kti, emK Ask Zvi t`tn mwAZ Kti ivtL| GB mwAZ Lv`B ZYtfvRx cOYxi Lv` wntmte e`euZ nq| Avevi gvsmvix cOYxi v ZYtfvRx cOYt`i Lv` wntmte e`envi Kti | Gfvte mKj Rxe Lv` I Lv`K m^uK^ovcb Kti BtKwmt`tg kw³ cOYv AqjXei vL Ges Gi ga` w`tg Drcv`K I mtePP Lv`K chSⁱ Lv`i th avivevntKZv m^uo nq Zvi bvg Lv`-wKj (Food chain)|



wPⁱ- 1.2-1t Lv`-wKj

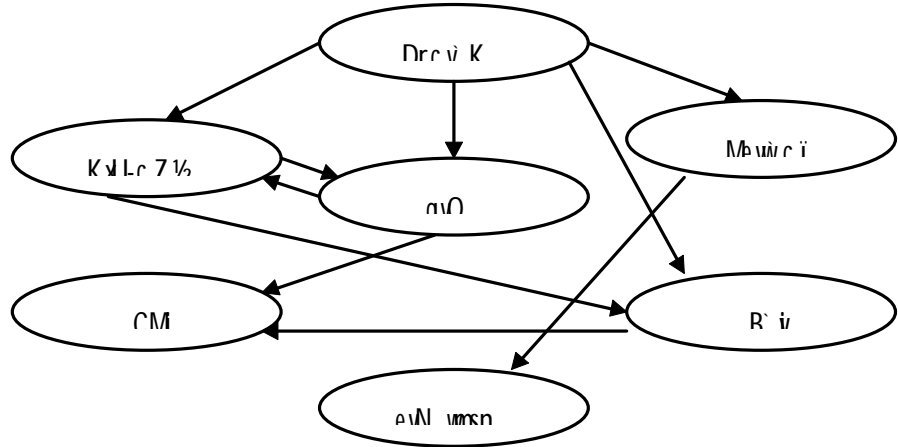
GKwU Lv`-wKjtj Drcv`tKi m^u KtqKwU chSⁱ Lv`K`li vKtZ cvti, Zte mtePP Lv`KtK tKvb cOYx Lv` wntmte MhY Kti bv| cKwZtZ mvariYZ wZb aitbi Lv`-wKj t`Lv hvq-

- (1) **wKviRix wKj (Predator chain)** t GB Lv`-wKjtj Drcv`K t`tK cQ^utg tQvU cOYx, cti mgvstq eo cOYx h³ nq| thgbt Nvm → dnos → e`v0 → mvc|
- (2) **ciRix wKj (Parasitic chain)** t GLv^ub eo Rxe t`tK mgvstq tQvU Rxei gta` Lv`-wKj Mto D^uv, thgbt gvby → gkv → g`vtj wi qvi RxeYy
- (3) **gZRix wKj (Saprophytic chain)** t GLv^ub Dw^mc I cOYxi gZt`tni Dci wfiE Kti Lv`-wKj Mto I v, thgbt gZt`n → QⁱvK → tKtPv|

Lv`-Rij (Food web)

cKwZK BtKwmt`tg Lv`-wKj ,tjv mKj mgq mij ct_ P^utj bv A₀ cQvRbtevtfa cOYxi Lv``t`ii cvi`uwiK wewbgq NtU| thgbt GKwU KvK miwmi MtQi dj tK Lv` wntmte MhY KitZ A₀ev ZYtfvRx KxU-cZ^utK Lv` wntmte tetQ wbtZ A₀ev KxU-cZ^utK Lv` wntmte MhYKvix Ab` tKvb cOYtKI Zvi Lv`-mvgM^ui A³S³ KitZ cvti | Gfvte GKwU BtKwmt`tg wewfbLv`-wKjtj i gta` cvi`uwiK wewbgq I msh^u i gva`tg th RuUj m^uK^oMto I v Zvi bvg Lv`-Rij | mvariYZ Lv`-Rijtj Drcv`tKi msL^v AwAK vKtj I Lv`tKi msL^v cLZ`t`i mgvstq nvm tctq v^utK|

¶PÎ 1.2-2 Lv`-Rvj

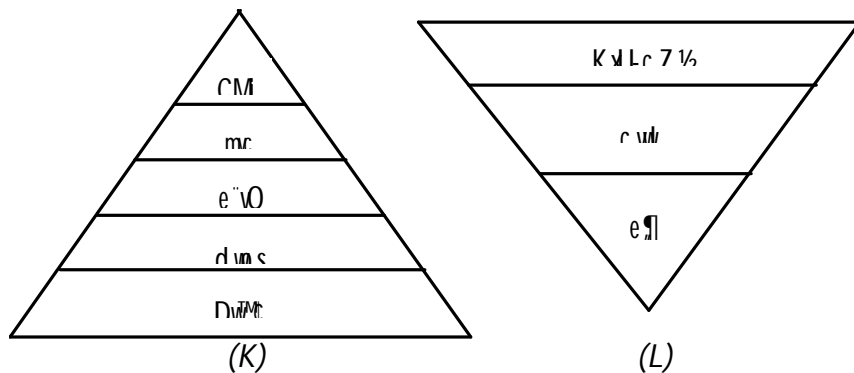


BtKvtj wRK`vj wciwgW, tj v
wZb aitbi ntq _vtK (K)
msL`vi wciwgW, (L)
Rieftii wciwgW Ges (M)
kw³i wciwgW|

Ablyj b (Activity) t Avcbvi Gj vKvq thme Rxe i tqtQ Lv`Rvtj i gva`tg Zv cKvk Kily|

BtKvtj wRK`vj wciwgW

th tKvb BtKvmt`-tg cÜ_wgK Drcv`K cÜ_g `t`ii Lv`K, wZxq `t`ii Lv`K, ZZxq `t`ii Lv`K Ges Gfvte mtePP Lv`tKi msL`v fi Ges kw³i gta` tKvb bv tKvb fvte GKwU m`úK® eRvq _vtK| Lv``fi _vj i gta` GB m`úK®K `j wLK ¶PÎ A¼b Øviv cKvk Kiv m`e, hv **BtKvtj wRK`vj wciwgW** bvtg cwi wPZ| BtKvtj wRK`vj wciwgW, tj v wZb aitbi ntq _vtK (K) msL`vi wciwgW, (L) Rieftii wciwgW Ges (M) kw³i wciwgW| msL`v I Rieftii wciwgW i AvKwZ. Lvov ev D`v`tv A_ev Ab` tKvb aitbi ntq cvti, wK³ kw³i wciwgW me`vB Lvov AvKwZi ntq _vtK|



¶PÎ-1.2-3: msL`vi wciwgW (K) ZY.fvgtZ Lvov I (L) eñl D`v`v wciwgW|

- K) AveZB NtU
- L) iayAcPq NtU
- M) iaym p nq
- N) w-i -vtK

3/ Lv - -lvst i i mKj -fi kw³i Kx NtU?

- K) Acwi ewZ -vtK
- L) ewxcB nq
- M) m^uY^qebó nq
- N) wKQy AcPq NtU

4/ th mKj c0Yx Dw^mc t fvrRx c0YxK Lv - wntmte MhY Kfi Zvt` i tK Kx etj ?

- K) c0_ugK Lv`K
- L) w0Zxq -fi i Lv`K
- M) mePK
- N) mtePP Lv`K

5/ ifcisi tKi cfi te`Re I A%Re c`v_ qKvb&Ae`vq wdti hq?

- K) KwVb Ae`vq
- L) Zij Ae`vq
- M) Avw` Ae`vq
- N) eqexq Ae`vq

6/ Drcv`K I mtePP Lv` tKi gta` Lv` i th avivevwnKZv m p nq Zvi big Kx?

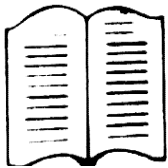
- K) Lv` -wKj
- L) Lv` -Rij
- M) Lv` -wci wgv
- N) kw³c0v

cw 1.3 wvfbai tbi BtKwmt ÷g

G cvV tk tI Avcub -



- ◆ c0KwZK I Kwlg BtKwmt ÷g Kx Zv ej tZ I wj LtZ cvi t e b |
- ◆ cKz, mvgyK, ebR, ZY.fug, giR Ges Kul.R BtKwmt ÷g m^utK^eY^ov Ki tZ cvi t e b |



Avtjv, evZvm, cvnb, gwU, Dw^mc, c0Yx, AYRie Ges Gt` i cvi -úmi K w^uqv-w^uqv w^ek-l tY tMwUv cw_exUvB GKwU wkvj BtKwmt ÷g | wKs' w^etk dY qgZvi w^ePt i GZ e`vcK GKwU BtKwmt ÷g ch^eqY ev ch^ej vPbv Kiv LqB `in e`vcvi | tm Kvi tYB BtKwmt ÷g i tki w^eb`vm c0qvRb hvZ Kfi A t c q^uKZ.tQvU GKwU GKK wntmte Zv ch^eqY Kiv hvq | Gt` i gta` i tqtQ c0KwZK I Kwlg BtKwmt ÷g |

1/ **c0KwZK BtKwmt ÷g t c0KwZK BtKwmt ÷g**, t jv gvbt | i n` t q c QvovB c0KwZK cvi t e t k MvZgqZv eRvq ti tL P t j | emuZi (Habitat) c0KwZ Abjvqx Giv `ai tbi n t q -vtK | thgbt

(K) **-j R BtKwmt ÷g t thgbt ebR BtKwmt ÷g**, ZY.f ugi BtKwmt ÷g, mrvfvb BtKwmt ÷g, giR BtKwmt ÷g BZ`w |

(L) **RjR BtKvmt÷g t** thgbt cjkz, b`x, Sibv, Lvj, n` BZ`w` `f`ycmbi BtKvmt÷g Ges mMi, gnvmMi, tgunbv BZ`w` tjvbi cmbi BtKvmt÷g|

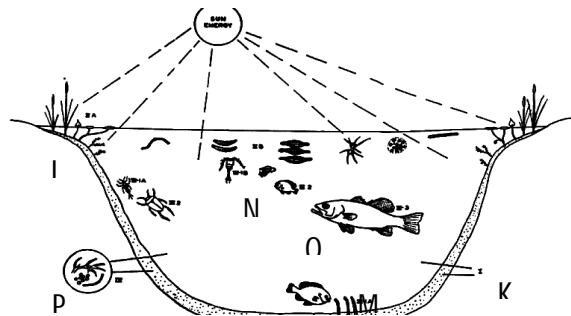
2/ **KulG BtKvmt÷g t** Gme BtKvmt÷gi tFsz ivmivubK cwi tek euj vsfk gubyl i ubqstY t`tK cwi Pnj Z nq, thgbt KulR BtKvmt÷g| Dcr`vbi w`K wektitY cUzW BtKvmt÷gi aib cUq GKB iKg| KviY mKj t`t`fB itqtQ `f`fvrX i ci`fvrX Dcr`vb| w`Ks` th mKj Rxe ubtq Dcr`vb, wj MvWZ Zv wfbzi | GLvtb KtqKuU cAvb BtKvmt÷gi eYbv t`qv nDj |

1/ **ckzi i BtKvmt÷g t** ckzi i BtKvmt÷g GKwU `qsm`uY`c`x`Z | Gi Dcr`vb, wj ubaifc Dc`vcb Kiv hraq t

(K) **Ro Dcr`vb t** Ro e`i gta` cAvb `Re I A%Re thSMK Dcr`vb, t`jv nt`Q-cmb, KveB-WvB-A- vBW, Av` tRb, K`ij imqvg, bvBtUfRb, dmtDU, A`imgtbr GmW, wDugK GmW BZ`w` | G, t`jvi AwaKvskB ckzi i Zj`tk Zjvbr wntmte Rgv `vtK Ges wKQycwi gvy Dw`m`c I cUyt`tn `eYxq Ae`vq `vtK|

(L) **cU`gK Dcr`bKvix t** ckzi i BtKvmt÷g `gaitbi cU`gK Dcr`bKvix cwi jw`Z nq| GKw`tK itqtQ meR Dw`m`c I wKQymitj vK-mstkdYKvix e`vKtUmiqv, Avevi Ab`w`tK itqtQ dvBtUvcusUb| gwUi mt`2 mshj A`ev fvmgub meR Dw`m`t`i gta` itqtQ, kvcjv, kvj`k, KPzxcvbr, tUvcvibr, f`jy`cub, nvBw`j v, Btj wWqv BZ`w` | dvBtUvcusUb, wj mvari YZ tQuU tQuU gy` fvmgub ub`v`k`iYi `kejRvZiq Dw`m`c I d`v`m`t`jU| ckzi Gt`i we`bz mvari Yfite hZ`- Mfvi Ziq m`h`P Avtjv t`c`U` ZZ`-t` chS| Zte ckzi i Lv` Dcr`b cU`uqiv Giv, i`z`c`Y`f`ugKv cvj b Kti `vtK|

ckzi i BtKvmt÷g `gaitbi
cU`gK Dcr`bKvix cwi jw`Z
nq| GKw`tK itqtQ meR Dw`m`c
I wKQymitj vK-mstkdYKvix
e`vKtUmiqv, Avevi Ab`w`tK
itqtQ dvBtUvcusUb|



- K. A%Re Dcr`vb
- L. cU`gK Dcr`K
- M. cU`gK Lv`K
- N. wZxq `t`i i Lv`K
- O. mte`P Lv`K
- P. weqvRK

wP`- 1.3 - 1: GKwU ckzi i BtKvmtog

(M) **Lv`K (Consumers) t** ckzi i Zj`tk eim Ges Dw`m`c Aetktli Dci wbfPkj teb`ubK RietMvxi gta` itqtQ gvQ, KxU-cZ`2, wSbjk, kvj`k, μvt÷w`kqv BZ`w` | Gme ZYt`fvrX Qvovl itqtQ tMSYLv`K, thgbt tQuU gvQ tL`q Rieb aviYKvix eo gvQ I KxU-cZ`2, e`vO, mic BZ`w` Ges iUdvi RvZiq RgusUb|

(N) **weqvRK (Decomposers) t** ckzi i weqvRKt`i gta` e`vKtUmiqv, d`v`m`t`jU Um Ges Q`v`K`i cAvb`B teuk| Giv mg`-l`ckzi mpe`Z`-vKtj I K`g`v`3 `v`b

Awak cwi givY we`gvb| GQovov cKzi uKQymsL`K UY`digri e`vKtUmi qvl
_vtK|

2/ **mgvYK BtKwmt÷g t** f;ctoi clq 70 fiM `vb Rto itqtQ mMi, gnvmMtii
we`tz.| mMtii cimb j eYv³ ni qri Kvi tY Gi i vmiqbK cwi tek Lg w`uZkxj |

(K) **Drcv`K t** mgvYK BtKwmt÷tgi c`vb Drcv`K nt`Q dvBtUvcusUb| thgbt
Diatom, Cereatium, Dinoflagellate, Goniolax, Gymnodinum, Ges meR,
bxj vf-meR, tj wnZ Ges ami `kevJ Awak`B teuk|

(L) **Lv`K t** cl`ugK ZYt`firRx Lv`tki gta` muvt÷ukqvb, tgvj v- (kvjK, uSbK),
kvKvKx gvQ BZ`w` c`vb| tMSY Lv`tki gta` itqtQ Herring, Shark, Cod,
Mackerel BZ`w` gismvKx gvQmgr-|

(M) **vetqvRK t** mgj`gZ Rxtai vetqvRK wntmte e`vKtUmi qvi c`vb`B gly`|
GQovov itqtQ uKQyQI vK| mgj`i 1 wj Uvi cwbZ 5 j 9| chS e`vKtUmi qv
_vKtZ crti | Gme e`vKtUmi qv Rxtai eR`I gZt`tni Dci u`uqv-u`uqv Uvi
Dw`i` i Rb` c`uqvRbxq A`Re c`v`mjo Kti |



thme AAjt evqzZ Rjxq
evt`ui cwi givY teuk uKs
ZvcgvIv teuk bq tmme `vrb
ebfugi mjo nq| Avenl qvi
ZviZtg`i I ci wfp` Kti
c`u`exi wevfbae `vrb wevfbae
aitbi ebvAtj i mjo ntqtQ|

Ablyj b (Activity) t cKz I mgvYK BtKvmt÷tgi cv`R`mgr Zj ai ab|

3/ **ebR BtKwmt÷g t** thme AAjt evqzZ Rjxq evt`ui cwi givY teuk uKs`ZvcgvIv teuk
bq tmme `vrb ebfugi mjo nq| Avenl qvi ZviZtg`i Dci wfp` Kti c`u`exi wevfbae
`vrb wevfbaeaitbi ebvAtj i mjo ntqtQ| Gme ebvAtj i wba`wi Z aitbi Dw`i` I c`u`Yx
wbq `Zs;`enk` eRvq _vKtj I Kg`cxwZ clq Awet`Q`

(K) **Drcv`K t** e`RvRvXq Dw`i`B etbi gly` Drcv`K| Aek` ebvAtj i c`kuz
Ablyvq e`Ri wRi wevfbae I `i`wev`vrm cv`R` itqtQ| thgbt D`ogUjxq
ebfug c`I`Siv c`kuzi ni qvq tmLvrb uKQyqv tclqK `j` (Sciophytic herbs)
I exi`RvRvXq MwQI Rtb; Averi bwiZkxZv` AAjxq ebfugtZ c`I`Siv,
u`Piniw r, Kvbv i aitbi AiY` mjo nq|

(L) **Lv`K t** cl`ugK Lv`K nt`Q ZYt`firRx c`u`Yx, thgbt tcvKv-gvKo, nwiY, ev`j,
wevfbaeaitbi cv`L, Kvweovj, Buj, nuz BZ`w`| Averi tMSY Lv`tki gta`
itqtQ, mvc, cv`L, u`Mi u`wU, ukqvj BZ`w` Ges Uvm`qvi Lv`tki gta` itqtQ-
uKQycv`L, evN, wmsn nvtqbr c`fuz|

(M) **vetqvRK t** ebR BtKwmt÷tgi vetqvRtki gta` itqtQ QI vK, e`vKtUmi qv,
t`c`UvRvqv, tbgvUvW, Gt`wv Wv, ugvj t`cW, tmi`t`cW, d`i`UI qig` tKtPv,
kvjK, u`ccov, DBt`cvKv BZ`w` |

4/ **ZYfugi BtKwmt÷g t** c`u`exi GK wev`Y`Gj vKv (clq 13 ugvj qb eM`gvBj) ZYUvi v
Av`Qw` Z| GLvrb evrmi K ewocitZi cwi givY 25-75 tm. ug. hvi dtj c`Pz Nvm Rtb; Ges
Gaitbi BtKwmt÷g Mto I tV| c`u`exi D`tj L`thvM` ZYfugi gta` KvbWvi wev`Y`
mgZj fvg, h`y`ivo; Av`Rw`E`bv, eM`Rj Ges `w`Y` Gukqv t`_tk ga` Gukqv chS ZYfug
itqtQ|

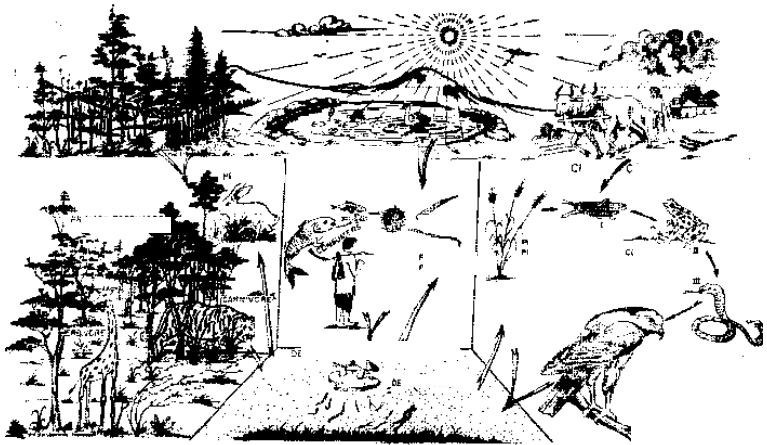
c`u`exi GK wev`Y`Gj vKv
(clq 13 ugvj qb eM`gvBj)
ZYUvi v Av`Qw` Z| GLvrb
evrmi K ewocitZi cwi givY
25-75 tm. ug. hvi dtj
c`Pz Nvm Rtb; Ges Gaitbi
BtKwmt÷g Mto I tV|

- (K) **c0_ugK Drcv`K t** Gramineae I Cyperaceae cwiertii Dv`M`i c0avb`B teik| Zte uKQyKQy,j`I weiytKI c0_ugK Drcv`K intmte t`Lv hvq|
- (L) **Lv`K t** ZYtFvRx c0Yx wektl Kti `b`cvqx Rxe, cvML, tcvKv-gvKo I mixmç ZtYi Dci gE` Lv`K intmte wbfPkxj | tMSY Lv`tKi gta` itqtQ ukqvj , mvc, e`vO, uUKuUk, cvML BZ`w` |
- (M) **wetqurK t** weifbæi`bi e`vKtUwiqv I tgvì , thgbt *Aspergillus, Rhizopus, Fusarium, Cladosporium* BZ`w` Dtj`-LthwM`|

evrmwi K ewocvtZi cwi gvY thLv`b Kg (mvari Yfite 25 tm.ug.-Gi wbtP) Ges thLv`b Zvtci AwaK` itqtQ tmLv`b giR BtKwm`÷g Mto I tV| cW_exi tgvU AvqZtbi c0q 17 fVM Gj vKvB gi gq|

5/ **giR BtKwm`÷g t** evrmwi K ewocvtZi cwi gvY thLv`b Kg (mvari Yfite 25 tm. ug.-Gi wbtP) Ges thLv`b Zvtci AwaK` itqtQ tmLv`b giR BtKwm`÷g Mto I tV| cW_exi tgvU AvqZtbi c0q 17 fVM Gj vKvB gi gq|

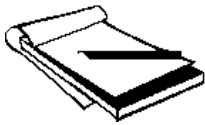
- (K) **c0_ugK Drcv`K t** c0avb Drcv`tKi gta` itqtQ .j` tSvc-Svo, K`vKUwm, gm, jvBtKb, uKQyNvm I e`I, bxj vf-meR `kevj BZ`w` | G mKj Dv`M`i gjj AmsL` kvLv ckvLvhç Ges gvUli mvgvb` wbp chStwe`Z| dtj mvgvb` ewocvZ ntj Lç mn`RB cvlb msMh Ki`Z cvti | c0`^tbi nvi Kgrtbi Rb` Gt` i cvZv, KvU I kvLv, tj v weifbævte ifcvstii Z ntq`_vtK|
- (L) **Lv`K t** GB BtKwm`÷g Drcv`b Kg nl qvi Kvi`Y Lv`tKi msL`vl Kg| giy Lv`tKi gta` mixmçRvZxq c0Yx I KxU-cZ½ c0avb| G0vov itqtQ giyRvovR etj L`vZ DU, tgl, gi ye`vO, B0y, tçPr, uUKuUk BZ`w` c0Yx|
- (M) **wetqurK t** giR BtKwm`÷g Z`bvgyKfite wetqur`tKi msL`vl Lç mwgZ| dtj gZt`n ctP mDgvm `Zwi nevi cwi etZ`AZ`waK Zvtc Zv` i uKtq hvq| GKvi`YB tmLv`b gvUli DePZv kw³ ewx cvq bv| ZeyZvc mn`Kvix uKQy msL`K QI`vK I e`vKtUwiqv tmLv`b wetqurK intmte KvR Kti |



uP1- 1.3-2: weifbæi`bi BtKwm`tóg

6/ **KulR BtKwm`÷g t** GuU gvbe m0 GKuU Kul`g BtKwm`÷g| GLv`b gvby Zvi Pwn`v Ablyqx ubw`0 dmtj i mte@P Drcv`b eRvq ivLvi Rb` c0quRbxq mvi, KxUvkk, tm`Pi e`e`v, AvMvQv Acmvi Y BZ`w` Kvhpçg Pij yivtL| dtj GLv`b Drcv`bB gY` welq|

- (K) Ro Dcr`vb t`vbxq RjevqygE`Kvi aib I LubR c`vt`P cwi`gvY, e`euZ`Re I A%Re mvi BZ`w` wgtj B Kul.R BtKvmt`÷tgi Ro Dcr`vb|
- (L) Drcr`K t PvlKZ.Dw`c B km` t`qj`T`i gly` Drcr`K| ZvQvov wef`b`eai`t`bi AvMvQv hv km` t`qj`T`i R`b`Zvivi Drcr`K wnmite`wetei`PZ|
- (M) Lv`K t c`u`gK` t`i Lv`t`Ki gta` itq`Q wef`b`eai`t`bi tcv`Kv, kkk, Buj, cvL, Mew`ci, gvby BZ`w` | tMSY Lv`t`Ki gta` itq`Q e`vO, mvc, wef`b`eai`t`bi cvL hviv tcv`Kv-gvKo tL`q R`eb avi Y K`ti |
- (N) w`etq`vRK t c`avb w`etq`vRKvixiv n`"Q e`vK`Uwi`qv, Q`T`vK I Actinomycetes. G`t`i c`Ebw`u`qvi d`t`j B gvL`t`Z Drcr`t`Ki Rb` c`u`q`vR`bxq`Re c`v`gR`Z`_v`K`|



Abxj b (Activity) t ZY`f`ig I Kul.R BtKvmt`÷tgi wj I Avj mgr`w`Pv`Z Ki ab|

civ`w`Ei gj`vqb 1.3



miv`K DE`ti i cv`k w`UK w`P`y (✓) w`b|

- 1/ c`k`zi dv`Bt`Uvc`v`S`U`t`bi we`v`iz. Kri`fc?
 - K) c`k`zi i me`P
 - L) c`k`zi i Zj`t`tk
 - M) hZ`y`ch`S`I Av`j`v`tc`S`t`Q
 - N) i`ay`K`b`v`i`v`q
- 2/ c`k`zi w`etq`vR`t`Ki cwi`gvY me`t`Ptq` tenk` tKv`_vq?
 - K) K`v`v`q
 - L) cv`bi Dc`ti
 - M) ga`v`t`i
 - N) c`k`zi i w`K`b`v`i`v`q
- 3/ miv`g`v`K BtKvmt`÷tgi c`avb Drcr`K t`Kv`b`U?
 - K) R`g`v`S`U`b
 - L) dv`Bt`Uv`c`v`S`U`b
 - M) m`v`t`o`n`k`q`v
 - N) e`v`K`Uwi`qv

- 4/ mgj` 1 ij Uvi cmbtZ e`vKtUvi qvi cwi gvY c`q KZ?
 - K) 20 j`
 - L) 10 j`
 - M) 5 j`
 - N) 1 j`

- 5/ Diatom Ges Gymnodium tKvb&BtKvmt÷tgi Drcv`K?
 - K) ckz
 - L) ebR
 - M) giR
 - N) mivgYK

- 6/ cw_eri enEg ZY.fug tKv_vq Aev`Z?
 - K) h`ivó`I KvbWvq
 - L) fviZ I cwk`tb
 - M) h`ivR` I dtY
 - N) Pxb I Rvcvfb

- 7/ ZY.fugi Drcv`K_vj tZ tKvb&cwi evti i c`lav` tenk?
 - K) Solanaceae I Malvaceae
 - L) Tiliaceae I Rutaceae
 - M) Gramineae I Cyperaceae
 - N) Citamineae I Papavaraceae

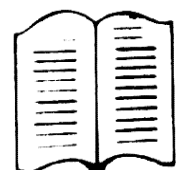
cw 1.4 cwi`teki I ci Dv`mc I ebiq`bi c`ve



G cvV tk`I Avcib -

- ◆ Dv`mc` i mvt_`vbxq Rjevqy evqgU`j i m`uK`Ztj aitZ cvi`teb/
- ◆ Dv`mc Kxfvte fug msi`Y e`e`v c`fweZ Kti Zv ej tZ I vj LtZ cvi`teb/
- ◆ Dv`mc` i mvt_`kw` I Rvj vmbi m`uK`bifcY Ki tZ cvi`teb/
- ◆ RbmsL`v evx I RxeRMtZ Zvi c`fve e`vL`v Ki tZ cvi`teb/

Avenl qvRvbZ Dcv`vb, gvU, cmb, RxeKj mevKQvmbtqB Avqv`i cwi`tek | RxeKtj i Ab`Zg Dcv`vb Dv`mc, hv GKgvI c`ugK Drcv`bKvix vntmte metenPZ | Avi Ab`me c`Yx cZ`Y ev c`tiv`Y fite GB Dv`mc Ktj i DciB vbf`Kvj | m`z`ivis cwi`tek I c`vYRMtZi mvt_` Dv`mc` i i`qtQ vbmP`m`uK`



meR Dv`mc I `vbxq Rjevqy

`vbxq Rjevqymsi`Y c`ZvU meR Dv`mc I MvQcivj vi GKvU fugKv i`qtQ, Zv tm Qvqv`vb KtiB tnvK A`ev evqyc`vtn c`ZeU`KZv m`v`v KtiB tnvK | MvQcivj v euj`vstk Av`v`v K Rjevqy c`fweZ Kti | meR Dv`mc c`^b c`vqvii gva`tg c`Zv`b necj`y cwi`gvY Rjxq ev`u evqgU`j Z`vM Ki`tQ | GB Rjxq ev`u Dc`i D`v kvZj evqj`y ms`utk`Gtm Nbrf`tebi gva`tg tg`N cwi`YZ nq Ges ev`ocvZ NUvq | AvqvRvb Dc`Z`Kvi tgvU ev`ocv`Zi c`q A`taRB

Dv`mc` i cvZv I
 cwi`cwk`RZvq th cwi`gvY
 tmsi`kv` cwi`ZZ nq Zvc
 kv`tZ cwi`YZ nq Zvi
 GKvU mevU AskB c`^b
 c`vqvii gva`tg vbitmZ
 nq | dtj Dv`mc I Zvi
 cwi`tek Av`Zvi` Zv`ci
 c`fvegy` _v`K | G Kvi`tYB
 Av`tj`vK D`v`j M`v`si` `v`z`j
 gy` Gj`vKv Atc`Yv e`Y`Ztj
 tenk kvZj Zv Ab`Yz nq |

KvL`cwi`vPvZ I cwi`tek

-vbxq Dm^o i c^o-^b c^ouqvi dj k^oZtZ ntq -vtK| Avi GB epoi cmbtZ CO₂ I b^oBtUtRbh^o ntq Avmvi dtj fugi De^oZvl ep^o cvq|

Dm^o i c^o-^b c^ouqvi Avti Kiu i z^ocy^o K nt^oQ evqexq Zvc tkviY Kiv| GK M^og cmb er^ourfe^obi Rb^o 580 K^ovj^o ki^o i c^ouqRb| Dm^o i cvZv I c^omi c^omk^oRZvq th c^ovi gvY t^osi ki^o c^oZZ ntq Zvc ki^o tZ c^ovi YZ nq Zvi GKiu wei^oU AskB c^o-^b c^ouqvi gva^otg vbi tmZ nq| dtj Dm^o I Zvi c^ovi tek AvZ^o i^o Zvtci c^ofv^oeg^o -vtK| G Kvi tYB Avtj vK D^o3/4j M^ot^osi -g^oji g^o Gj vKv A^otc^o v e^o v^o Ztj tenk kxZj Zv Ab^oz nq|

uk^oi ue^otei ci t^o-tK
AwaKn^oti Ryj v^ob f^o-
nt^obi Kvi tYB evq^oU^otj
CO₂ Gi c^ovi gvY t^oto
Ptj t^oQ Ges Zv GLt^obr
Ae^ov^onZ i t^oqt^oQ|

Rm^oZm^ostNi Lv^o I Kul.
ms^o-vi (FAO) vnt^ome gtZ,
D^og^oU^oj xq AA^otj evr^omi K
eb DRv^otoi c^ovi gvY 11.4
vej^o qb tn^oi | vek^oR^ojo
gvb^oji Kgr^ov^oti Kvi tYB
10 kZisk Rv^og B^otZv^ota^oB
wei^ov fig^otZ c^ovi YZ nt^oqt^oQ
Ges Avi I 25 kZisk u^og^oki
m^oab|

me^o Dm^o I evq^oU^oj

te^oP -vKvi Rb^o c^ovi K^oj- evq^oU^oj t^o-tK AZ^ovek^oK^oxq Dcv^o-v^ob vnt^ome Av^o tRb (O₂) M^ohY K^oti Ges Kve^o-v^ob-A- v^oBW (CO₂) Z^ovM K^oti | u^oK^oS^o Dm^o c^ovi YK^otj i e^oR^oCO₂ M^ohY K^oti m^otj vKms^ot^okl^oY c^ox^oU^oZ^otZ Zv Av^oEx^oK^oiY K^oti | Kve^o M^ohYK^ovi x M^ov^oQ^ocvj vtK GKvi tYB U^oKve^o av^oi K^o ej^o v nq| G c^ouqvi gva^otg c^ouZ^o b c^ouZ^o tn^oi me^oR fug t^o-tK Dm^o c^oq 900 t^oK^oR Kve^o Av^oEx^oK^oiY Ki t^oQ Ges e^oR^ovnt^ome c^oq 650 t^oK^oR Av^o tRb Z^ovM Ki t^oQ| e^oZ^oU^otb evq^oZ CO₂ Gi c^ovi gvY c^oq kZK^oiv 0.035 f^ovM ev 350 v^oc^ou^oGg| u^oK^oS^o 1957 m^otj Zv u^oQj 315 v^oc^ou^oGg| uk^oi ue^otei ci t^o-tK AwaKn^oti Ryj v^ob f^o-nt^obi Kvi tYB evq^oU^otj CO₂ Gi c^ovi gvY t^oto Ptj t^oQ Ges Zv GLt^obr Ae^ov^onZ i t^oqt^oQ| Z^ov^oov gv^obt^oi eva^oz P^ovi^o th^ov^oM^ob v^o tZ v^oM^otq m^ovi vek^o! R^ojo v^ove^oP^oti eb v^obab Pj t^oQ| Gi dtj c^ovi tek GK^o tK n^ovi^oQ Kve^o Av^oEx^oK^oiYi D^orm Ges Ab^o v^o tK Av^o tRb D^orc^o-b^oK^ovi x c^ou^oK^oz^oK Kvi Lv^olv| Rm^oZm^ostNi Lv^o I Kul.ms^o-vi (FAO) vnt^ome gtZ, D^og^oU^oj xq AA^otj evr^omi K eb DRv^otoi c^ovi gvY 11.4 vej^o qb tn^oi | vek^oR^ojo gv^obt^oi Kgr^ov^oti Kvi tYB 10 kZisk Rv^og B^otZv^ota^oB wei^ov fig^otZ c^ovi YZ nt^oqt^oQ Ges Avi I 25 kZisk u^og^oki m^oab| eb DRv^ooKi^oY Av^ogt^o-i t^o-k^oi v^oc^oU^oq^o tbB| f^ovi Z v^oe^of^ovM^oK^ovtj 1947 m^otj G^ot^o t^ok eb fugi c^ovi gvY u^oQj 24 kZisk u^oK^oS^o e^oZ^oU^otb Zv K^otq v^oM^otq c^oq 6 kZisk v^o v^oot^oqt^oQ| 1983 m^otj BZv^oji t^oiv^og t^o-tK c^ou^omk^oZ U^oR^ov^o v^obi Rb^o Kv^oU^o k^ol^o c^ouZ^ote^o-tb ev^osj vt^o-t^ok^o i^o az^oi e^o v^o ms^oKU Z^ov^ooZ t^o-k vnt^ome v^oPy^oZ Kiv nt^oqt^oQ|

vek^o! R^ojo G^ofi^ote eb v^obab K^oh^oAe^ov^onZ -v^oK^otj evq^oU^otj CO₂ I O₂ Gi f^ovi m^oig^oZ^ov Avi I Av^o-v^oZ^ok^oxj ntq DV^ote| dtj eva^oz CO₂ Gi Kvi tY t^oto h^ote M^oh^o n^ovDR c^ouZ^ou^oqv| Avi Av^ov^ooZ^o c^ovi Yv^ozi v^o tK G^ov^oM^otq h^ote vek^o! m^oKj c^ovi YK^oj | Z^ovB CO₂ Gi Av^oEx^oK^oiY c^ouq^o ev^ovt^obr^oi Rb^o GK^o tK th^ogb eb DRv^ooKi^oY t^oiva Kiv c^ouq^oRb, Ab^o v^o tK tZ^ogv^ob Avi ev^oqv^ob K^og^oP^ox M^ohY Kiv AZ^ovek^oK|

Dm^o I fug msi vY

fug msi vY me^o Dm^o I ev^ovt^obi f^o v^og^oK^ov AZ^o-s^oi i z^ocy^o evq^ol Rj xq v^oq^oR^ov^oZ Kvi tY c^ouZ e^oQ^oi j v^o j v^o Ub gv^oU fugi D^oci t^o-tK Ac^om^ovi Z nq| G^otZ fugi D^orc^o-b^ok^oxj Zv n^om cvq, gv^oU Ab^oveZ ntq c^oto Ges fugi D^oci t^o-tK Dm^o Av^oQ^ov^ob v^oeb^o nq| gv^oU t^o-tK Lv^o v^o-Ac^om^ovi Z v^ovi Kvi tY A^o-ev^o j ev^oY^o Z^ov ev Rj v^ox^oZ^ov Kvi tY gv^oU Ab^o v^o ntq c^oto| G^om^oKj D^ocm^ot^oM^o v^oia^ox Dm^o I ev^ovt^obi c^ouZ^ot^oiva e^o-v^o M^oto Z^oz^otZ c^oti | evq^oyc^ouZ^ot^oivax e^ov^ovt^obi K^oti e^ov^oti D^o-PZ^ovi 20^o Y c^ovi v^ogZ Rv^oq^olv evq^oq^oR^ov^oZ c^ofi^oe t^o-tK i v^o Kiv m^oae | P^oxt^o e^o v^o v^oiv evq^oyc^ouZ^ot^oivax Av^okt^o ej q m^oo K^oti km^o D^orc^o-b c^oq u^o Y Kiv m^oae nt^oqt^oQ| gi^ot^ovtZ e^ov^ovt^obi gva^otg ev^oij q^omo v^oiv^osi c^ouZ^onZ K^oti Kul. fug^otK i v^o Kiv nq| Ae^o-v^oBMZ Kvi tY c^ouZe^oQ^oi G^ot^o t^oki D^ocK^oj xq G^oj v^oK^ov N^oY So I m^ov^ot^oK^ovt^obi c^ofi^oe t^o-tK h^ote | G Ae^o-v^o t^ogv^oK^ovt^oev^oq D^ocK^oj xq eb fug I g^ov^obt^oM^of eb^ov^oAj ki^o k^ov^o x c^ouZe^oUK vnt^ome Kv^oR Ki tZ cv^oti |

e^ov^ovt^obi K^oti e^ov^oti D^o-PZ^ovi
20^o Y c^ovi v^ogZ Rv^oq^olv
evq^oq^oR^ov^oZ c^ofi^oe t^o-tK i v^o
Kiv m^oae | P^oxt^o e^o v^o v^oiv evq^o
c^ouZ^ot^oivax Av^okt^o ej q m^oo K^oti
km^o D^orc^o-b c^oq u^o Y Kiv
m^oae nt^oqt^oQ|

meR Dirmc I ebfig epocvzi cfveRvBZ figlq mungZ ivL, eb'vzmoZ cmb cbrtn clZeUKZv mpo Kti Ges figtK msNex titL qlqiva Kti | DpZxj yDcZ`Kvq Dirmc`i G aitbi cfve LyB , iZcYq KvhRix|

Avst-dmj (Inter cropping) |
mv_x-dmj (Alley cropping)
Pvl cxwZ AbyriY Kti ktm'i
Drcv`b I figi DePZv DfqB
eRvq ivLv nq|

Dirmc`i cvZv I eR³cPb mqv gva'tg figi inDgvm I DePZv kw³ ep` Kti | tKvb tKvb Dirmc evqgU'tj i bvBtUtRb mivmvi gmltZ AveXKitYi gva'tg clKwZK mvi msMhKvii i figKv cij b Kti | Gmtei gta` Wvj RvZxq dmtj i gsj emevmKvix ugt_vRme e'vKtUvi qv 0viv Avnvi Z bvBtUtRtbi bvg meklfvte D'tj-L'thm`| AtbK t'jt' Avst-dmj (Inter cropping) | mv_xdmj (Alley cropping) Pvl cxwZ AbyriY Kti ktm'i Drcv`b I figi DePZv DfqB eRvq ivLv nq|

Dirmc I kw³

th tKvb hshvb cwi Pvj bvi Rb` kw³ i c0qvRb| Nmoi KvUv K0hij Z w`cS A_ev e'vUvni tZ iu'jZ kw³ LiP Kti mgq wbt`R Kti | Rxe'tKI MwZkxj ev Kvh'lg ivLvi Rb` kw³ i c0qvRb| Avi Rxei GB kw³ Avtm Lv` MhY I Zv wecvtki gva'tg| wKs' GB Lv` i Rb` cwx' mKj c0Yx'tKB cZ`'l ev ctiv'fivte Dirmc`i DctiB wbfP KitZ nq|

meR Dirmc I MvOcvjv cvZvi tKviti vdtj i mivith` tmsi kw³ tK KvR j wltq evqgU'tj i CO₂ I guEKv` cmbi 0viv kK'vRvZxq Lv` `Zvi Kti | ZY'tfivRv c0Yx' cZ`'l fivte Gme Dirmc tK Lv` i f'c MhY Kti | Avevi gvsmvix c0Yxiv ZY'tfivRv c0Yx'tK Lv` i f'c MhY Kti Rxeb aviy Kti | mZ'iv Lv` i f'cx Rvj vbi avik wmvte Dirmc`i tKvb weK' tbb| G Kvity Dirmc e'ZxZ cwx' tZ Rxe'tbi Av`ZB Ki bv Kiv hvq bv|

Dirmc I RbmsL'v ep`

cwx' eZ'vb RbmsL'v clq
550 tKwU Ges clZ eQi
clq 2% nvti Zv tetu
Ptj tQ| RbmsL'v ep`i GB
nvi Ae'vZ `vKtj AvMgx
40 ermtii gta` cwx'
RbmsL'v clq w0, Y nte|

cwx' eZ'vb RbmsL'v clq 550 tKwU Ges clZ eQi clq 2% nvti Zv tetu Ptj tQ| RbmsL'v ep`i GB nvi Ae'vZ `vKtj AvMgx 40 ermtii gta` cwx' RbmsL'v clq w0, Y nte| cwx' tZ eZ'vb th Avev` thvM` Rvq AvtQ Zv w` tQ GB ewaZ RbmsL'vi Lv` thvMvb t`qv hvte bv| dtj D'v'eb KitZ nte Avi I Avak DdkvRv'Zi dmj Ges DbzZi Drcv`b c0Yx' | Avi Gme wKQj vmt`_B m'v' `v'tK cwi tek `t'Yi AvksKv|

Zte Lv` thvMvb cl'qv euj vstKB wbfP Kite Kx cwigvY `lZvi vmt`_ meR Dirmc tmsi kw³ tK e'envi thvM` Lv` kw³ tZ i gvs'ti Z KitZ cvitQ Zvi Dci | GK mgx'lvq t` Lv tM'tQ cwx' tZ th cwigvY tmsi kw³ vK-mstkd'tYi gva'tg Lv` kw³ tZ cwi YZ nq Zvi kZKiv 50-80 f'vMB mvti msNvUZ nq| ZvB weK' Lv` wmvte c0Yx'tK f'iel tZ mvti i w'tKB nq'tZv ZvKv'tZ nte| Zte mgq `vK'tZ RbmsL'v mungZ ivLvB DrKó. c'sv|

meR Dirmc I Rvj vb

mf`Zvi G h'tM Rvj vbi c'vb Drm nt`Q KvV, Kqv v, wltRj , tctU'tj , c0KwZK M'vm BZ'vw` | Gme_ t'vB cZ`'l ev ctiv'fivte Dirmc RvZ Dcv`vb| myt- AZxtZ gmlj wbtP Pvcv cto eo eo e'f' Kqvq cwi YZ ntqtQ| fM't'gRy tZj I M'vm cKvivi'sti Dirmc I c'Yxi t`n t`tKB m'p c`v`_p Kv'tRB eZ'vb hws'K mf`Zv'tK Dirmc B mPj titL'tQ| Zte Dirmc RvZ GmKj c`v`_B cwi tek `t'Yi Ab`Zg KvY nq `wotqtQ| Avevi Dirmc B Gi AtbKvsk AvE'vKi t'Yi gva'tg cwx' tZ Dcnvi w` tZ cvti wbg' cwi tek |

Dw`c I RieRMZ

gubly Zvi Lv`", e`i; evm`vb, AvmevecI, kw`3 ev Rly vb Ges ``bw`b e`enih`Avi I eU DcKi`Yi Rb` cL`"q] ev ctiv`q]fivte Dw`c`i Dci wbf`Pkxj | GgbwK ti`vMi JIa, t`bkiRvZ `e` GmeI Dw`c`i `vb| i`aygvbyB bq c`u`exi hveZxq c`OYxKj Dw`c` Qvov Zt`i Aw`Zj; eRvq ivL`Z cvti bv| KviY me c`OYxB Lv`"i Rb` cL`"q] ev ctiv`q]fivte Dw`c`i Dci wbf`Pkxj |

c`OYxi wbtktmi mvt_ MpxZ
O₂ Dw`c`i mvtjvK-
mstk`dY c`u`qvi DcRvZ|
Avevi cktmi mvt_ wBMZ
CO₂ Dw`c`i mvtjvK-
mstk`dY c`u`qvi AwZ Ri`yx
Dcr`vb| m`zi`is evqg`U`j
CO₂ I O₂ Gi fivmvg`
i`q]vq Dw`c` I c`OYx
I Zt`c`Zfivte RvovZ|

ZvB c`k`w`Z`Z Dw`c`, c`OYx I cwi`te`tki mvt_ i`tq`Q wBM`y m`u`K`q c`OYxi wbtktmi mvt_ MpxZ O₂ Dw`c`i mvtjvK-mstk`dY c`u`qvi DcRvZ| Avevi cktmi mvt_ wBMZ CO₂ Dw`c`i mvtjvK- mstk`dY c`u`qvi AwZ Ri`yx Dcr`vb| m`zi`is evqg`U`j CO₂ I O₂ Gi fivmvg` i`q]vq Dw`c` I c`OYx I Zt`c`Zfivte RvovZ| GQvovI ew`ocivZ, evqg`U`j i Zicgv`Iv, eR`ebvZ, Kj KviLvvi t`axqv I k`a BZ`w` c`OZnZ Kti cwi`te`tkK `^Q ivL`Z Dw`c`i Ae`vb i`tq`Q|



Ablyj b (Activity) t O`c`u`extZ gublymn Ab`vb` c`OYxi Aw`Zj meR Dw`c`i vRxi Dci wbf`Pkxj O- G Dw`3wIi h_v`Zv c`OYV Ki`b|

cv`W`Ei gj`vqb 1.4



mivK DE`ti i cv`tk wUK wPy (v) w`b|

- 1/ meR Dw`c`i tK Kve`B avi K ejv nq tKb?
 - K) Kve`B-WvB-A· vBW Z`vM Kti etj
 - L) Aw` tRb Z`vM Kti etj
 - M) Kve`B Av`ExKiY Kti etj
 - N) Aw` tRb Av`ExKiY Kti etj

- 2/ eZ`g`v`tb evqg`U`j CO₂ Gi cwi`g`vY KZ?
 - K) 300 w`c`w`Gg
 - L) 315 w`c`w`Gg
 - M) 325 w`c`w`Gg
 - N) 350 w`c`w`Gg

- 3/ GK M`ig` c`vnb ev`u`rfetb KZ kw`3 i c`O`qvRb?
 - K) 380 K`vj w`i
 - L) 580 K`vj w`i
 - M) 680 K`vj w`i
 - N) 780 K`vj w`i

- 4/ eZ`g`v`tb evsj v`tk ebf`v`gi cwi`g`vY KZ?
 - K) c`O`q 25 kZvsk

- L) c0q 24 kZvsk
- M) c0q 15 kZvsk
- N) c0q 6 kZvsk

5/ GK tn±i Riq t_±K Dm^mc c0Zw b Kx cwi gvY CO₂ AvE^xKi Y Kti?

- K) c0q 650 tKwR
- L) c0q 850 tKwR
- N) c0q 1250 tKwR
- M) c0q 1050 tKwR

6/ e^qtivctYi gva`tg emj qmo c0Zti va e`e`v tKv_vq Pij yAvtQ?

- K) ersj vt`tk
- L) fvi tZ
- M) gi t°vtZ
- N) ktj vavq

7/ c_w_exi RbmsL`v ewxⁱ nvi (c0q) KZ?

- K) 1%
- L) 2%
- M) 3%
- N) 4%

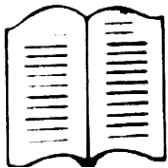
cw 1.5 ersj vt`tki cwi tek bwi I cwi tekMZ Ae`v



G cvl tktl Avciob –

- ◆ cwi tek bwiZi tcl^qZ I Dtik` eY⁰v Ki tZ cvi teb|
- ◆ cwi tek bwiZgij vi wewfbaw` K m^utK^oavi Yv w` tZ cvi teb|
- ◆ ersj vt`tki cwi tekMZ Ae`v Avtj vPbv Ki tZ cvi teb|

cwi tek bwiZi tcl^qZ



AvR mekRto cwi tek Ae^qtqi w` k0mgn m^yu0 ntq DVtZ i i yKti tQ| tMwv gvbe RwiZtK Avmbawech^qi nVZ t_±K i q^lvi Rb` Zvb mek^vcx Pj tQ wei vgnxb c0P0v| gvbe m^tPZbZv RwiMtq tZij vi Rb` c0ZeQi Aby0Z nt`Q mek^v cwi tek w` em| GQrov Zt`i Av`vb-c0vb I fivel`Z Kg^exwZ wbaftYi Rb` AvAj K I AvSRwZK ch^qq Aby0Z nt`Q e^u tmvgbvi I wmt^uvRqvg|

mek^vcx cwi tek wech^qi
 G m^us^j tMe ersj vt`tki
 Ae`v Avil Ki⁰l GLvtb
 t`Lv w` t`Q Dch^qwi eb`v,
 Liv, NwSo Rtjv`Qv^tmi
 gtZv c0KwZK` jh^m|

mek^vcx cwi tek wech^qi G m^us^j j tMeersj vt`tki Ae`v Avil Ki⁰l GLvtb t`Lv w` t`Q Dch^qwi eb`v, Liv, NwSo Rtjv`Qv^tmi gtZv c0KwZK` jh^m| t`tki DEivAj gigqZvi c0vgK j q^lYw` BtZvgta`B Aby0Z nt`Q| b`-b`xi wba^stk jeYv³Zii c0Kvc evotQ| fivg^qlq, ebvAj i`⁰ Ae^qlq, Rjevqyl Avenl qvi Av`i Zmn Ab`vb` cwi tekMZ mgm`vl we`gvb i tqtQ| GB tcl^qtZ cwi tek msi q^lY I Db^qb msp^us^j Kv^hq^ug mgšq Kivi Dtik` ersj vt`k mi Kti i cwi tek I eb gš^lyj q t`tki cwi tek` tY I Ae^qlq msp^us^j mgm`w i Pw^yZ Kti 1992 m^tb cwi tek bwiZ cl^qqb Kti tQb|

cwi tek bwiZi Dtik`mgn

úgwKi mæšnb br nq Zv ubwðZKiY| grm` mæú`i Rb` ŋwZKviK cwb Dbqab, eb`v ubqšY I tmP cKí mgfni cBjg`vqb Ges gvQ PwI i meKí e`e`v MhY|

9| **Lv` bwiZ t Lv`** Drcv`b, msi ŋY, cŋuqvRvZKiY I eEb e`e`v `v` I cwi tek mæšZ fivte ubwðZKiY| webó Lv` cwi tek mæšZ fivte ub`úwEKiY Ges `v`i Rb` úgwK`fj Lv` e`v` Avg`vb ubw`xKiY|

10| **DcKjxq I mgyK cwi tek t DcKjxq I mgyK** BtKwmt`tgi cwi tek mæšZ msi ŋY I Dbqab ubwðZKiY Ges GZ` Dcjŋ MtelYv Kvhŋg tRvi`viKiY| DcKjxq I mgyK GjvKvq me ai tbi Af`šli xY I `e`wK `Ygj-K KgRvU cŋZti vaKiY| msuk-ó GjvKvq gZ gvŋQi cwi gvY mnbkij gvŋvq ivLvi e`e`vKiY|

11| **thMthM I cwi enb t`j, tij,** wegvb I tbšc_ cwi tek `Ygy` ivLvi ev`é c`fŋc MhY| Af`šli xY tbš-e`i I WKBqWŋgr KZR cwb I `j fivMi `YKv` ubqšYKiY|

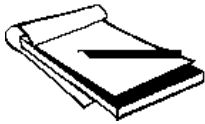
12| **Mp I bMivqb t Mp I bMivq tbi** mKj cwi Kíbv I Mtelbvq cwi tekMZ wší mæú`³KiY| kni I MŋvĀtj i AvenmK GjvKvq chŋµtg cwi tek mæšZ mŋhM-mŋeaw` mæú`vi Y Ges ubqšY| bMivi tms`h`eaŋb Rjvktqi Dci `iazi cŋvb|

13| **RbmsL`v msvšl bwiZ t Rbkiv³** mgyšZ, mgyi Kwí Z I cwi tek mæšZ e`envi ubwðZKiY| Dbqabj-K KvR gvnj v`i mæú`³KiY Ges teKvi Rbkiv³ e`envi DrmwnZKiY|

14| **wŋŋv I MY-mtPZbZv t`tki** mweR Dbq tbi Rb` ubi ŋi Zv `i Kti wŋŋtzi nvi `Z ew`KiY| cwi tek msi ŋY I Dbq tbi e`vci t e`vck MY-mtPZbZv mŋóKiY| cŋZómbK I A-cŋZómbK mKj wŋŋv Kvhŋtg cwi tek msvšl wŋlq Ašif³KiY| mi Kvix, temi Kvix I wki cŋZóv t ubtqwrZ KgRZP, KgPwi I kŋgK`i cŋkŋY KgŋwPZ cwi tek msvšl wŋlq Ašif³RiY|

15| **wÁvb I chŋ³ MtelYv t RvZxq** wÁvb I chŋ³ bwiZi Avl Zvq Dbq tbi mKj tŋtĀ cwi tek `Y Z`vi K I ubqšYi e`e`v AvivcKiY| RvZxq mæú`i j vMmB, `xN`vq Ges cwi tek mæšZ e`envi ubwðZKi t Yi jŋŋ cŋqvRbxq MtelYv I chŋ³ D`wŋeb DrmwnZKiY|

f`tki mweR Dbq tbi Rb` ubi ŋi Zv `j Kti wŋŋtzi nvi `Z ew`KiY| cwi tek msi ŋY I Dbq tbi e`vci t e`vck MY-mtPZbZv mŋóKiY|



Abŋj b (Activity) t ersj v`tki cwi tek bwiZ KZUv tg t b Pjv n`Q| cwi tek bwiZ ev`evq t b Avcbri cŋlemgr Ztj ai ab|

ersj v`tki cwi tekMZ Ae`v

tKvb t`tki cwi tekMZ Ae`v ubfP Kti Zvi t fšMij K Ae`vb, Avenl qvi Zvi Zg`, ebRmæú`i cwi gvY, gvU i cKwZ, Av`mgywRK Ae`vb, RbmsL`v, wŋŋvi nvi, wkt`i AMhni Zv BZ`w`i Dci | Zte ersj v`tki cwi tek Aeŋtqi cŋvb Kvi Y, t jv n`Q t

1| **RbmsL`vi Awak`**

cŋq GK j ŋ Pŋwŋj-k nvrvi eM`wKtj wgvUv RvqMv ubtq ersj v`tki Ae`vb| Gi RbmsL`v eZŋv t b cŋq 12 tKwU Ges eirmwK ew`xi nvi 2.1 fivM| mŋwZ RvqMvq wecj RbtMvóxi Ae`vb, Zv`i `wi`a I Awkŋv, cŋŋŋ I ctivŋfivte ersj v`tki cwi t`tki Dci Pic mŋó Ki tQ|

2/ **tfŠMuj K Ae`ib I cÜKuzK`jha**

ersj vt`k cÜv, tgNbv, hgbv cÜvZ. b`x metašZ cu_xi Ab`Zg epr e-0xc t`k| DEi
I ceĀtj mngZ cvnmoqv D`Pfig eif` cĵi v t`kÜvB GK vekij mgfug| t`tki gvS
w`tq KK0µmšl tiLv AwZµg Kivq G t`k µvštq AĀj fž| Zte mMi mmba`
nlqg Ges tgšmgy evqj cĵite GLvfb kvZ I MĀt`šj ZxeZv cĀKU bq| gvbe mō
KviY Qvovl veĵkl tfŠMuj K Ae`vbi Rb` ersj vt`tki cwiĵek Avi thme KviŷY
ŷwZMŪInq Zv nŷ`Q t

eŷzvcmmĀti mō AwaKisk
NwYSOB ersj vt`tki DcKĵj
AvNvZ nvtb| ersj vt`tk veĵkl
aitbi tgvPvKwZi DcKĵj tiLv
_vKvi KviŷYB GgbwU nŷ`vĵK|

(K) **NwSo t** eŷzvcmmĀti mō AwaKisk NwYSOB ersj vt`tki DcKĵj AvNvZ nvtb|
ersj vt`tk veĵkl aitbi tgvPvKwZi DcKĵj tiLv _vKvi KviŷYB GgbwU nŷ`
_vĵK| cĵj NwYSO I Rĵj v`Qvĵmi KviŷY cĀž cŪYnmb I mæut`i Aeŷq
NŷU| Avev` RvĵZ tj vbr cmb XžK DeŷZv webó Kĵi, dtj `ŷfimeK cwiĵek
webó nq|

(L) **eb`v t** cÜv, tgNbv, hgbv mn tQvU eo eü b`x ersj vt`tki Dci w`tq engvb|
cĀq me_wj b`xiB DrcwĒ`j ersj vt`tki evBti| elŷtgšmĵg Gme b`x cĀž
cmb I cuj enb Kĵi gvV NvU Qmctq Zĵj| Gi mŷ_ thwM nq tgšmgy
ewōcvZ| dtj mgfugĵZ t`Lv t`q eb`v| tgšmgyt`f` eb`vi cĀKvc LgB
ZxeZi nq| dtj t`fm hvq gvV, NvU, kni, e`i, Ges MĀg-Rbc`| wecy
ŷqŷwZ NŷU gvV dmtj i Ges emo Nŷi i| cŪYnmb NŷU giby, Mew`ci I
Ab`vb` cŪYxi| `wZ nŷ` cto cmbmn cwiĵetki Ab`vb` Dcv`vb| dtj
cŪ ŷŷe NŷU Kĵj iv, UvBdtqW, Avĵkqmn cŪYvZx eü ti vtMi |

(M) **Kvj`ekvLx I Utb`Wv t** cÜZeQiB `PĪ`-ekvL gvĵm i`ŷivtI AvNvZ nvtb
Kvj`ekvLx| tgšmgy-ce`FZž Ggb ŠtovejZvm cĀvbZ DEi cwiĵg w`K t`ĵK
cĀvvnZ nq| GB Štoi mtePP telM 60 t`ĵK 130 wK. wĵ. Gi gĵa` mĵgve`
vĵK| GB Štoi mŷ cĀž ewōcvZ Ges KLtbr KLtbr eRĵm kvj v ewōcvZ
NŷU| Kvj`ekvLxi eR`ĵgN KLtbr KLtbr kw`3 mĀq Kĵi gvivZK AvKvi aviY
Kĵi Ges nvnZi i`toi AvKwZ. m`k tgN figi w`ĵK tbtg Avtm| Gi brg
Utb`Wv| `f mgtqi gĵa` tKvb `vbi evqj Pvc `ŷ Kĵg 25 wĵj evti i wĵP
tbtg Avmtj fquen Utb`Wvi Avk`v _vĵK| Utb`Wvi i`toi AvL Zvq _vĵK cĀÜ
NwY` th GjvKvi Dci w`tq G So cĀvvnZ nq tmLvfb Niemo, MvQ-cij v PY`
wePY`nŷ`q hvq| cŪY nri vq AmsL` cŪYx| AĵbK mgq gvĵvi dmj chŠl Rĵj
cĵo hvq|

3/ **Rjy vb I ebm`u`**

`Z MvZĵZ evotQ ersj vt`tki RbmsL`v| GB RbmsL`vi Rb` cŪqvRb eim`vb,
AimevecĪ, Rjy vb BZ`w` DcKiY| Avi Gmĵei wmsn fivMB AvmtQ ebm`u` t`ĵK|
dtj t`tki mngZ ebm`u` i Dci µgvMZ Pvc evotQ| eZŷvrb ersj vt`tk ebfigi
cwi gvY cĀq 6 kZvsk| mŷi vs eb DRwvKiŷYi dtj cwiĵetki fvi mvg` webó nŷ`Q |
fig ŷq ZjwšZ nŷ`Q, b`xi fivb I ew`x cvt`Q | cĵve cotQ Avenl qvi Dci
evotQ So Rĵj v`Qvĵmi ZxeZv| Avev`j mskwPZ nlqg wectbie gŷLvgy eü
eb`cŪYx|

4/ **AcwKwZ bMivqb**

t`tki tgvU RbmsL`vi kZKiv
12 fVM knivA`tj eim Kti | epr
kni`uj i gta` XvKv kn`ii
RbmsL`v 60 j`f`i Dc`i Ges
AvMvgx 2000 mt`j i gta` nqZ
1 tKvU Qmo`tq hv`e |

t`tki tgvU RbmsL`vi kZKiv 12 fVM knivA`tj eim Kti | epr kni`uj i gta` XvKv
kn`ii RbmsL`v 60 j`f`i Dc`i Ges AvMvgx 2000 mt`j i gta` nqZ 1 tKvU Qmo`tq
hv`e | Ab`vb` eo kni`uj i RbmsL`vi `Z ep`x cv`f`Q | GB ewaZ RbmsL`vi Rb` th
bvMwi K mt`hvm mjeavi c`lqvRb tQvU eo tKvb kn`iB Zv cwi Kwi Zfv`e Mto D`Vvb |
kni`uj tZ i`tq`Q AvqZt`bi Z`z`bvq AwaK RbmsL`v, Acwi Kwi Z Aveim Mpr, msKxY`
iv`-NvU, T`p`c`c`q`c`l`v`j`x | gqjv vb`wkb e`e`v, h`I`Z`I` ew`l`GjvKv Ges AvI
e`u`ea mgm`v | dt`j kn`ii evm`v`v`v c`lqv k`l`m`h`t`S`j` ti`vM, h`z`v, Kug, WvBwi qv,
Avgvkq, tncvUvBvUlm, Ges UvBd`t`q`Wi g`f`Zv Acwi "Ob`ecwi`tek | `j`Z` c`wb` m`p`v`S`l`
ti`v`M Av`p`v`S`l`n`t`q`_`v`K |

5/ **Acwi Kwi Z`v`k`v`q`b**

evsj v`k`v`k`v`i`vb`z` t`k`bq | Z`v`nc` tQvU eo tek wKQy`k`i` c`l`Z`o`vb` GLv`tb` i`tq`Q Ges
bZ`b`fv`e` Mto DV`f`Q | f`v`ix` w`k`f`i` i` gta` i`tq`Q` cvU, e`j` v`P`vb, KvMR, w`m`tg`E, mvi Ges
RvnrR` vb`g`f`y | gvSvix | f`l`z`v` w`k`f`i` i` gta` Pvgov, Lv`, ZvgvK, Mv`tg`E`m, w`w`v`-`j`w`i
w`k`f`i` i` bvg` D`j`-L`th`v`M | AwaKvsk` w`k`i` Kvi Lv`v`v`t`j`vi Ae`vb` w`k`i` GjvKvi` evB`ti,
t`h`gb` b`-b`xi` av`ti` A`_`ev` tKvb` AveimK` GjvKvq | GmKj` w`k`i` Kvi Lv`v`v`t`_`t`k` w`b`M`Z`
eR`c`wi` t`k`v`a`t`bi` tKvb`e`e`v`tb` | dt`j` Zv` cwi`tek` `t`Yi` Ab`Zg` Kvi`Y |



Ablyj b (Activity) t` evsj v`k` knivA`tj` thme` cwi`tekMZ` mgm` i`tq`Q` Zv` eY`v` Ki`ab |
Gme` mgm`v` mgyav`tb` Av`cbri` mgywi` kmgr`-Z`j` ai`ab |



c`v`w`E`i` g`j`v`q`b` 1.5

mivK` DE`ti` i` cv`tk` wUK` wP`y` (v)` w`b |

- 1/ KLv` evsj v`k` mi` Kvi` cwi`tek` bwiZ` c`b`q`b` Kti`b?
 - K) 1982 mt`j
 - L) 1985 mt`j
 - M) 1992 mt`j
 - N) 1995 mt`j
- 2/ c`l`Kv`ZK` Z`S`i` e`envi` Drm`v`v`v`Z` Kiv` tKvb`&bwiZi` A`S`f`?
 - K) w`k`i` bwiZ`
 - L) R`yj` v`vb` bwiZ`
 - M) `v`-`v` bwiZ`
 - N) K`v`l` .bwiZ`
- 3/ `v`-`v`i` Rb` `ugvK`-`f`c` Lv`-`-`e`v`w` Avg`v`bx` w`b`w`l` x`Ki`Y` tKvb`&bwiZi` Ask?
 - K) evMYR` bwiZi` Ask
 - L) Lv`-` bwiZi` Ask
 - M) `v`-`v` bwiZi` Ask
 - N) K`v`l` .bwiZi` Ask
- 4/ tKvb`wU` M`p`v`q`b` I` bMi`v`q`b` bwiZi` Ask` bq?
 - K) Kiv`Vi` w`k`i` e`envi` Drm`v`v`v`ZKiv`Y`

Kul.1 cj. Dbaq b`z

- L) bMxi Rj vktqi tmš`h`e`x`Ki Y
- M) cwi tekmašZ Mp-ubgP
- N) AvevmK Gj vKvq cwi tekmašZ mšhvM maúhvi Y

5/ ešvcvMš i mP AwaKvsk NwšSo evsj v`k DcKtj AvNvZ nrbri gj- Kvi Y Kx?

- K) evsj v`k DcKj xq t`k weavq
- L) μvštq AĀtj i t`k etj
- M) e-θxcxq t`k nl qvq
- N) we`kl tgvPvKvZi DcKj ti Lvi Rb`

6/ evsj v`k kxZ I Mš`š i ZxeZv Kg nl qvi Kvi Y Kx?

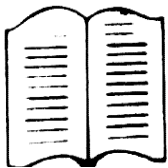
- K) mivMi mivbæ` I tgsmsgx evqy
- L) KKθ μvšš i mivbæ`
- M) DĒi -ceĀj xq D`Pfvq
- N) b`x wešašZ eθxc

cw 1.6 evsj v`k i Kul.cwi tek AĀj mgtni cwi vPvZ



G cvV tkłI Avciob -

- ◆ evsj v`k i Kul.cwi tek AĀj mgtni big ej tZ I wj LtZ cvi teb|
- ◆ tKvb&Kul.cwi tek AĀj tKv_vq Aew`Z Zv ej tZ I wj LtZ cvi teb|
- ◆ Kul.cwi tek AĀj mgtni cāv b`enkó` kbr³ Ki tZ cvi teb|
- ◆ tKvb&cwi tek AĀtj Kx ai tbi dmj RtbžZv wj LtZ cvi teb|



weÁvbmšZ Kul.e`e`v cwi Pvj vri Rb` Kul.cwi tek AĀj maúšK`ev`é Ávb_vKv evĀYxq| ZvB G cvtV evsj v`k i Kul.cwi tek AĀj mgtni msvĀJB cwi vPvZ Zžj aivi cĀPón tbqv ntqtQ| mšhvMvRZ gvbwPšĀ evsj v`k i 30wU Kul.cwi tek AĀtj i Ae`vb t`Lv tbn ntqtQ|

Kul.cwi tek AĀj - 1 t cjuZb ingyj q cv` fvg

cĀMo I VvKžMvi tRjvi AwaKvsk `vb Ges w`bvRcy tRjvi DĒi cwiĀgvĀj vbtq G Gj vKv MvWZ| GLvbKvi AwaKvsk fvg DĒz(58%) ev gvSmi DĒz(34%), emZemo I Rj vfvqgi cwi gvY 7 fivM| gvU tetj -t`vAvka t`k t`vAvka| `Re c`v`Kg, pH gv b 4.5 t`k 5.5| i we tgsmsg meivR, tMvj Avj yMg, tev ti varb, AvL cāv b dmj | Lwi c - 1 tgsmsg AvDk aiv I cvU Ges Lwi c - 2 tgsmsg ti vcv Avg tbi Pvl nq|

Kul.cwi tek AĀj - 2 t mivq vZ`v cieb fvg

vbj dvgvix, iscj, jvj gvbi nU, KwoMog I MvBeivUv tRjvi vZ`v, aijv I `šKgvv b`xi wešašZ Zxi eZx`mi yGj vKv vbtq G AĀj MvWZ| G AĀj gvSmi DĒz(72%) ai tbi fvg vbtq

MWZ| gnu tetj -t`vAvka t`K t`vAvka| pH gvb 6.0 t`K 6.5 chS| iue tgsmg Abvew` | Lwi c - 1 tgsmg tevbr AvDk Ges Lwi c - 2 tgsmg Avgb cãvb dmj |

Kul.cwi tek AAj - 3 t vZ`-v micP cieb fig

epEi iscj tRjvi Awakisk `vb, cAMtoi ceAaj, w`bvRcj, e,ori DEivAaj Ges RqcjnuU, bI Mv I ivRkvn tRjvi Askwetkl nbtq G AAj MWZ| Awakisk fig gvSmi DpZ (51%) t`K DpZ(35%)| gnu mvari YZ t`vAvka| `Re c`vt`P cwi gvY Kg| pH gvb 5.4 t`vK 6.5 chS| iue tgsmg gj-Z Wvj RvZxq dmtj i Aver` nq| Lwi c - 1 tgsmg tevbr AvDk Ges Lwi c - 2 tgsmg Abvew` _vtK|

Kul.cwi tek AAj - 4 t KiZvqv evZj x c-veb fig

e,ori c eAaj i AaBk Ges imivRMÄ tRjvi Awakisk `vb G AAaj i Aš f`| fig cãvbZ gvSmi DpZ(44%) Ges DpZ(23%) ai`bi | emZemo I Rjvfugi cwi gvY 14 fVM| gnu MVb cij -t`vAvka t`K cij MWZ Kvur-t`vAvka| pH gvb 5.4 t`K 5.7 chS | iue tgsmg cãvb dmj gvmKj vB I gi`i | Lwi c - 1 tgsmg tevbr AvDk Ges Lwi c - 2 tgsmg tivcv Avgb|

Kul.cwi tek AAj - 5 t vB`Avi vB teimb

G AAaj i Awakisk `vb bI Mul bvtUvi tRjvq Aew`Z| wKQy v`z`Ask ivRkvn, e,or I imivRMÄ tRjv chS we` Z| GLvbKvi fig g j Z gvSmi vba ai`bi (86%)| emZemo I Rjvfugi cwi gvY kZKiv 4 fVM| gnu K`g v`| `Re Dcr`vtbi cwi gvY ga`g| pH gvb 4.8 t`K 6.0 chS| iue tgsmg Abvew` | Lwi c - 1 tgsmg tevbr Avgb Drcbnq Ges Lwi c - 2 Abvew` _vtK|

Kul.cwi tek AAj - 6 t vB`eY`ev cieb fig

bI MutRjvi cwi g cõtš i Askwetkl Ges bevemÄ tRjvi me`DEi cõtš i Askwetkl nbtq G AAj MWZ| Awakisk `vb vbaAj (60%) Ges wKQyGjvKv gvSmi vbaAj (10%) ai`bi | emZemo I Rjvfugi cwi gvY kZKiv 30 fVM| gnu K`g v` I `Re Dcr`vtbi cwi gvY ga`g ai`bi | pH gvb 4.5| iue tgsmg tevrtvavtbi Pvl nq _vtK| Lwi c tgsmg Rvq cwiZZ _vtK|

Kul.cwi tek AAj - 7 t mµq epcj I hgby cieb fig

KwMäg tRjvi c eAaj, MvBevÜv, e,or, imivRMÄ Ges cvebr tRjv, tkic`ji i cwi gvAj, Rvgj cy, Uv`vBj I gvbKMA tRjv nbtq G AAj MWZ| GQvov XvKv, gvYMA, bvi vqYMA Ges Pucj tRjvmg tni Askwetkl G AAaj i Aš f`| gvSmi DpZRvigi cwi gvY 37 kZvsk, gvSmi vBPzRvq 20 kZvsk Ges emZemo I Rjvf`vq 30 kZvsk| gnu ei`U g j Z tetj/cij gnu mg`x| pH gvb 7.5 t`K 7.9| gvSmi DpZRvigtZ iue tgsmg Abvew` A`ev Mg, Avj yPvbr ev`vg, Lwi c - 1 tgsmg cvU I tevbr AvDk Ges Lwi c - 2 mg`q tivcv Avgtbi Pvl A`ev cwiZZ _vtK|

Kul.cwi tek AAj - 8 t bZh epcj I hgby cieb fig

tkicj, Rvgj cju I Uv1vBj tRj vmg tni cuDgvAaj, gmbKMA, XvKv, gvYMA, bviqYMA I MvRxcj tRj vmg tni Askuekl Ges cjuZb epcy b` msj Mægggbmsn, KtkviMA I biims`x tRj vi Askuekl ubtq G AAj MvZ| fig gvSmi DEz(42%), DEz(18%) Ges gvSmi ubPz(19%) ai tbi | emmo I Rjvkq 12 fivM| gvu t`vAvk| pH gvb 5.5 t_k 6.8| iue tgsmjg DEzRig cuZZ _vtK, Ks`gvSmi DEzai tbi Rig tZ tMj Avj ymvi Iv, gvmKj vB I Avtgi Pvl nq| Lwi c - 1 tgsmjg DEz gvSmi DEzRig tZ tevvi/tivcv AvDk Ges cvtUi Pvl nh| Lwi c - 2 tgsmjg ubPzRig cuZZ Ges gvSmi I DEzRig tZ tivcv Avg tbi Pvl nq|

Kul. cuittek AAj - 9 t cjuZb epcy cæb fig

tkicj, Rvgj cju, Uv1vBj, gqgbmsn, tbTtKiv, KtkviMA, biims`x I bviqYMA tRj vmg tni ue` xYAAj Ges XvKv I MvRxcj tRj vi Kq`sk ubtq G AAj MvZ| GLvbKvi fig DEz(28%), gvSmi DEz(35%), gvSmi ubPz(20%) Ges ubPz(7%) ai tbi | emZemo I Rjvfugi cuigvY kZKiv 10 fivM| gvu cuj -t`vAvk, Re c`v`Kg | pH gvb 4.5 t_k 4.9 chS | DEz gvSvi x DEzRig tZ iue tgsmjg Mg, mvi Iv I Wj RvZiq km` Pvl nq| Lwi c - 1 tgsmjg AvDk I KQycvtUi Pvl nq Ges Lwi c - 2 tgsmjg tivcv Avg tbi Pvl nq|

Kul. cuittek AAj - 10 t mjuq Mzv cæb fig

beveMA I ivRkivx tRj vi Mzv me tashZ AAj t_k ewi kuj I j Rxcj tRj vi tgNbv chS G GjvKv ue` Z| kZKiv 33 fivM gvSmi DEzRig Ges 18 fivM gvSmi ubPzF ig ubtq G GjvKv MvZ| emZemo I Rjvfugi cuigvY 33 fivM| gvu t`vAvk, Re c`v`Kg, pH gvb 6.9 t_k 7.9| cavb Drcbædmj iue tgsmjg tLmvi, gvmKj vB, mvi Iv I tevvi| Lwi c - 1 tgsmjg AvDk, cuU, Ges Lwi c - 2 tgsmjg Abvev` _vtK|



uP1 1.6.1 t ersj v`tki Kul.cwi tek AAj mg n

Kul.cwi tek AAj - 11 t D'P M'v c'eb fig

beveMÄ, ivRkivnx, cvebvi `wYisk, K'obqv, tgtni cy, PzvwW'v, uSbvB`n, gv, iv, htkvi Ges Ljybv I mvZ'xi vi DEivÄj, Ges bl Mul boiBj tRj vi m'gub` Gj vKv G AA'tj i Aš'f` | GLv'tb kZKiv 43 fivM DE'fig, 32 fivM gvSvvi DE'fig, 11 fivM emZewo I Rj v'fig Ges evK ubaf'ig | gvuU cij -t`vAvk, `Re c`v`Kg, pH gvb 6.1 t`K 7.9 | i ne tgšm'g cävZ Wj RzXq dmj, Mg, mvi Iv, tMj Avj yAv'g BZ`w` f'ij R'tb' | Lvi c - 1 tgšm'g tev'v aib I civ Ges Lvi c - 2 tgšm'g ti vcv Avg'tbi Pvl nq |

Kul.cwi tek AAj - 12 t ubaM'v c'eb fig

btUvi, cvebvi, tMvqj ` , dvi `cy, gv`vixcy, tMv'vj MÄ, kvi qZcy, K'obqv, gv, iv I boiBj tRj vi c evsk, Ljybv I evtMiv'v'Ui DEi-c evsk, emi kv'tj i DEivsk, Ges gvbKMÄ, XvKv I g'v'M'tÄi `wY-c'v'g'v'Äj v'btq G Gj vKv MvZ | GLv'tb kZKiv 13 fivM DE'fig, 29 fivM gvSvvi DE'fig, 31 fivM gvSvvi ubaf'ig, 14 fivM ubaf'ig Ges evKUr emZewo I Rj v'fig | gvuU cij -t`vAvk t`K Kv`v-t`vAvk | `Re c`v`ga`g, pH gvb 6.2 t`K 7.7 ch'š | i ne tgšm'g cävZ Wj RzXq km` Ges mvi Ivi Avev` nq | Lvi c - 1 tgšm'g tev'v AvDk I civ, AvDk + Avgb Ges Lvi c - 2 tgšm'g ti vcv Avgb, tev'v Avgb A_ev c'vZZ `v'K |

Kul. cūġtek AĀj - 13 t Mġv tRiqvi cġeb fiġ

emi kvj , Sij KwW, ucti vRcj, cUqvLij x, ei ġ br Ges mġ i ebmn evġMi nvU, Lġybv I mvZġxi v tRj v ubtq G AĀj MvWZ| GLvbKvi Awakvsk fiġ (78%) gvSmi Dġzaiġbi | emZemo I Rj vfiġi cwi gvY 18 fivM| gmv t`v-Avka, `Re c`v_ġga`g| pH gvb 6.5 t_ġK 7.0 chŚ | i me tgŚmġgi cġvb dmj gvm I gMKj vB| Lwi c - 1 tgŚmġg AvDk Ges Lwi c - 2 tgŚmġg tivcv Avġġbi Pvl nq|

Kul. cūġtek AĀj - 14 t tMcvj MĀ Lġybv Rj vfiġ

gv`vi xcy, tMcvj MĀ, bovBj , hġkvi , evġMi nvU I Lġybv tRj vi vevġB ubaĀj ubtq G GġvKv MvWZ| G GġvKvi Awakvsk fiġ gvSmi ubPz(41%) t_ġK ubPz(28%) aiġbi | gmv K`ġv³ I t`vAvka aiġbi | pH gvb 6.5 t_ġK 7.0 chŚ | i me tgŚmġg cġvbZ Mg, mwi Iv I tQvj v RvZxq dmj fvj Rġbġ| Lwi c - 1 tgŚmġg Awakvsk GġvKv Abvev` A_ev AvDk Rġbġ| Lwi c - 2 tgŚmġg tivcv Avġb cġvb dmj |

Kul. cūġtek AĀj - 15 t Aviqj vġj

gvY MĀ I XvKv tRj vi vġj vĀj ubtq G GġvKv MvWZ| GLvbKvi Awakvsk fiġB (73%) ubPz emKv gvSmi Dġzaiġbi | emZemo I Rj vfiġi cwi gvY kZKiv 14 fivM| gmv K`vġq, `Re c`v_ġga`g Ges pH gvb 5.4| i me tgŚmġg tevġiv I vKQyWvj RvZxq dmj Rġbġ| vKŚ`Lwi c - 1 I 2 Abvev` _vġK|

Kul. cūġtek AĀj - 16 t ga` tgNbv cġeb fiġ

vKġkvi MĀ, evġYemoqv, Kġġj-v, Pūcġ, bi vms`x I bvi vqY MĀ tRj vmg ġni Askvġġkl ubtq G AĀj MvWZ| GLvbKvi Awakvsk fiġ gvSmi uba (29%) Ges uba (25%) aiġbi | emZemo I Rj vfiġi cwi gvY kZKiv 27 fivM| gmv t`vAvka, `Re c`v_ġKġ, pH gvb 4.9 t_ġK 5.5 chŚ| i me tgŚmġgi cġvb dmj tevġiv, mwi Iv I Wj RvZxq km`| Lwi c - 1 tgŚmġg AvDk, AvDk + Avġb Ges Lwi c - 2 cūZZ _vġK|

Kul. cūġtek AĀj - 17 t ubaġgNbv cġeb fiġ

Pūcġ, j ġġcy I tbi vqLij x tRj v ubtq G AĀj MvWZ| G GġvKv vZb aiġbi fiġ iġqġ0: Dġz(14%), gvSmi Dġz(28%) Ges gvSmi ubPz(31%)| emZemo I Rj vfiġi cwi gvY kZKiv 27 fivM| gmv cūj -t`vAvka, `Re c`v_ġga`g, pH gvb 5.0 t_ġK 6.0| Dġz gvSmi DġzRiġġZ i me tgŚmġg mwi Iv, vcvR, gvP BZ`v` dmj Rġbġ A_ev Abvev` _vġK| gvSmi ubPzRiġġZ tevġiv, Mg, mwi Iv BZ`v` cġvb dmj | Lwi c - 1 tgŚmġg cġq me aiġbi RiġġZ AvDk (tevġiv/tivcv) Ges Lwi c - 2 tgŚmġg tivcv Avġb cġvb dmj |

Kul. cūġtek AĀj - 18 t bZb tgNbv tġnbnv cġeb fiġ

PEMg, tdbx, tbi vqLij x, j ġġcy, t fiv v, emi kvj , cUqvLij x I ei ġ br G AĀġġ i AŠ f³ | fiġ gvSmi Dġz(45%) aiġbi | emZemo I Rj vfiġi cwi gvY 48 fivM| gmv cūj -t`vAvka, `Re c`v_ġga`g, pH gvb 6.1 t_ġK 6.8 chŚ | i me tgŚmġg tLmwi , mwi Iv, I tevġiv cġvb dmj | Lwi c - 1 tgŚmġg cġqB Abvev` A_ev tġġPi gva`ġg tevġiv Pvl nq| Lwi c - 2 tgŚmġg meġ tivcv Avġb nġq _vġK|

Kul.cwi tek AAj - 19 t cjuZb tgnbv tgnbv cieb fig

uKtkviMÄ, nneMÄ, efbYemoqv, Kugj-v, tbvqvLijx, j`fjxcj, biims`x, bvi vqYMA, XvKv, kvizCcy, gv`vixcj, tMicyjMÄ, ewikvj tRjv ubtq G GjvKv MmVZ | gnuU gvSwii DpZ (24%), gvSwii ubPz(33%) Ges ubPz(21%) aitbi | emZevox I Rjvfugi cwi gvY 17 fVM | gnuU cij -t`vAvka, t`vAvka I Kv`vgq | `Re c`v`ga`g, pH gvb 5.0 t`tK 6.5 chS | iue tgSmjg teftiv, mwi Iv cäv dmj | Lwi c - 1 tgSmjg, AvDk, cvU Ges Lwi c - 2 tgSmjg ti vcv ev tevbn Avgb cäv dmj |

Kul.cwi tek AAj - 20 t ce`mjgv Kvkqviv cieb fig

umtj U, tgj fjevRvi, mbyvMÄ I nneMÄ tRjv ubtq AAj MmVZ | GLvrb itqt0 gvSwii DpZ Rng (25%), gvSwii ubPzRng (20%) Ges ubPzRng (36%) | emZemo I Rjvfugi cwi gvY 14 fVM | gnuU cij -t`vAvka I Kv`vgq, `Re c`v`ga`g, pH gvb 4.7 t`tK 6.9 chS | iue tgSmjg teftiv A`ev Abvew` | Lwi c - 1 tgSmjg AvDk, AvDk + Avgb A`ev Abvew` Ges Lwi c - 2 tgSmjg ti vcv Avgb A`ev Abvew` |

Kul.cwi tek AAj - 21 t umtj U teimb

mbyvMÄ, nneMÄ, tbTtkvbn, uKtkviMÄ Ges ue. emovvi epEi GjvKv ubtq G AAj MmVZ | GLvrbKvi Avakisk figB ubPz(43%) emKuv gvSwii ubPz(19%) Ges AvZ ubPz(23%) | emZemo I Rjvfugi cwi gvY 11 fVM | gnuU t`vAvka t`tK GtUj, `Re c`v`D`P, pH gvb 4.7 t`tK 4.9 chS | iue tgSmjg cäv dmj teftiv avb | Lwi c - 1 tgSmjg tevbn Avgb A`ev Abvew` | Lwi c - 2 tgSmjg ti vcv Avgb A`ev Abvew` |

Kul.cwi tek AAj - 22 t DEi I ce`cv fig

tkicj, tbTtkvYv, mbyvMÄ, umtj U, tgj fjevRvi, ue.emoqv I Kugj-v tRjv ubtq G GjvKv MmVZ | GLvrb itqt0 cävZ DpZRng (33%), gvSwii DpZRng (31%) Ges gvSwii ubPzRng (23%) | emZemo I Rjvfugi cwi gvY 10 fVM | gnuU tetj -t`vAvka, t`vAvka Ges cij -t`vAvka | `Re c`v`ga`g, pH gvb 4.5 t`tK 5.8 | iue tgSmjg g jv, gvmKij vB, mwi Iv I teftiv A`ev Abvew` | Lwi c - 1 tgSmjg AvDk (tebv/ti vcv), tevbn Avgb A`ev Abvew` Ges Lwi c - 2 tgSmjg ti vcv Avgb/Abvew` |

Kul.cwi tek AAj - 23 t PÄMg Dckj mgZj fig

tcbv, PÄMg Ges K` evRvi Dckj msj MxGjvKv ubtq G AAj MmVZ | GLvrbKvi fig cävZ gvSwii DpZ(43%), DpZ(17%) Ges gvSwii ubPz(13%) | emZemo I Rjvfugi cwi gvY 27 fVM | gnuU cij -t`vAvka, `Re c`v`Kg Ges pH gvb 5.6 | iue tgSmjg wefbaai tbi mewR, Lwi c - 1 tgSmjg tevbn/ti vcv AvDk Ges Lwi c - 2 tgSmjg ti vcv Avgb |

Kul.cwi tek AAj - 24 t tmEgUj tKvij 0xc

tmEgUj tKvij 0xc ubtq G GjvKv MmVZ | GLvrbKvi fig gvSwii DpZ(63%) t`tK DpZ (33%) aitbi | emZemo I Rjvfugi cwi gvY 2 fVM | gnuU tetj t`tK tetj -t`vAvka, `Re c`v`Kg, pH gvb 7.0 t`tK 7.5 | iue tgSmjg cäv dmj gkjv, wcvR, i mby/Abvew` | Lwi c - 1 tgSmjg Abvew` Ges Lwi c - 2 tgSmjg Abvew` /ti vcv Avgb |

Kul.cwi tek AAj - 25 t mgZj eti`AAj

Kul. I c j n Dbq b t z

w b v R c j , M v B e v U v , R q c j n v U , e , o v , b l M u m i v R M A Ges b i t U v i t R j v i b t q G A A j
M v Z | f i g g j Z g v S w i D P z (5 5 %) t t K D P z (3 0 %) | e m Z e m o I R j v f i g i c w i g v Y 9
f v M | g n U t v A v k a , R e c v K g , p H g v b 5 . 0 t t K 5 . 7 | i e t g S m t g A b v e w / A v g , t M j
A v j y u c q v R , M g , m i i l v | L w i c - 1 t g S m t g A b v e w / A v D k (t e v b v / t i v c v) G e s L w i c - 2
t g S m t g t i v c v A v g b |

Kul. cwi tek AAj - 26 t D'P eti' AAj

i v R k v n x , b e v e M A I b l M u G j v K v i b t q M v Z | g j Z D ' P f i g (9 3 %) | e m Z e m o I
R j v k t q i c w i g v Y 6 f v M | g n U t v A v k a , R e c v K g , p H g v b 4 . 8 t t K 5 . 9 | i e t g S m t g
A b v e w / t e v t i v , A v L , M g , W j R v Z x q d m j | L w i c - 1 t g S m t g g j Z A b v e w A _ e v t e v b v
A v D k G e s L w i c - 2 t g S m t g t i v c v A v g b |

Kul. cwi tek AAj - 27 t DEi-ce'eti' AAj

w b v R c j , i s c j , M v B e v U v , R q c j n v U , e , o v G j v K v i b t q M v Z | f i g c a v b Z g v S w i D P z
(5 6 %) t t K D P z (3 6 %) e m Z e m o I R j v f i g i c w i g v Y 7 f v M | g n U t v A v k a , R e c v K g , p H
g v b 4 . 8 t t K 5 . 6 | i e t g S m t g t e v t i v , m i i l v , g u m K v j v B , m e i R , A v L | L w i c - 1
t g S m t g A v D k , t g v c v U G e s L w i c - 2 t g S m t g t i v c v A v g b / A b v e w |

Kul. cwi tek AAj - 28 t gajyMo AAj

X i v K v , M v R i c j , b i m s x , b v i v q Y M A , U v z v B j , g q g b i m s n G e s u K t k v i M A t R j v i A s k w e t k l
i b t q M v Z | f i g c a v b Z D P z (5 3 %) I g v S w i D P z (1 8 %) , g n U t v A v k a , R e c v K g , p H
g v b 4 . 8 t t K 5 . 5 | i e t g S m t g m i i l v , M g , A v L , t e v t i v | L w i c - 1 t g S m t g A v D k
(t i v c v / t e v b v) / A b v e w G e s L w i c - 2 t g S m t g t i v c v A v g b / A b v e w |

Kul. cwi tek AAj - 29 t DEi ce'cnvox AAj

c a v b Z L v M o i Q u o , e v i e b , P A E M g , K e v R v i , t g S j f i x e v R v i t R j v i c v n n o A A j G e s
t k i c j , g q g b i m s n , m b v g M A , w e . e m o q v , K u g j - v I t d b x t R j v i u l j i m g x A A j | c a v b Z
D P z f i g (9 2 %) | e m Z e m o I R j v f i g i c w i g v Y 5 f v M | g n U t v A v k a , R e c v K g , p H g v b
4 . 8 t t K 5 . 5 | i e t g S m t g w e f b e a i t b i m e i R , u g u o A v j y A v L B Z w i P v l n q | L w i c - 1
t g S m t g m e i R , A v D k A _ e v A b v e w G e s L w i c - 2 t g S m t g t i v c v A v g t b i P v l n q |

Kul. cwi tek AAj - 30 t AvLiDiv tmcvob

w e . e m o q v G e s n w e M t A i t j y G j v K v i b t q G A A j M v Z | f i g c a v b Z D P z (5 5 %) G e s g v S w i
D P z (1 1 %) | e m Z e m o I R j v f i g i c w i g v Y 6 f v M | g n U t v A v k a , R e c v K g , p H g v b 5 . 5
t t K 6 . 5 | i e t g S m t g i c a v b d m j A v g , K j v , M g , m i i l v | L w i c - 1 t g S m t g t i v c v A v D k ,
c v U , n j y G e s L w i c - 2 t g S m t g t i v c v A v g b A _ e v A b v e w |

cvfVei gj'vqb 1.6

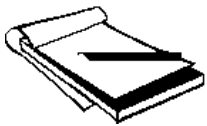
m i i W K D E t i i c v t k u K i P y (v) w b |



- 1/ tKvb&tRj v cjuZb ingvj q cv` fugi Aš f³ bq?
 K) iscj
 L) ir`bvRcj
 M) cÂMo
 N) ViKžMvU
- 2/ m³uq uZ⁻ v c-vebfugtZ fugi aib Kx?
 K) DĖz
 L) ubPz
 M) gvSwi DĖz
 N) gvSwi ubPz
- 3/ bI MutRj vi DĖi cĖš tKvb&Kul.cwi tek AĀtj i Aš f³?
 K) ubæAvT vB teimb
 L) ubæc Y³ev **cueb** fug
 M) m³uq uZ⁻ v **cueb** fug
 N) Ki tZvqv ev³vj x **cueb** fug
- 4/ M³v tRvqi c-vebfugtZ Lwi c tgšm³g cĀvb dmj Kx Kx?
 K) mwi Iv I Avg
 L) meivR I Avg
 M) AvDk I cvU
 N) gvm I gMKj vB
- 5/ Avni qvj vej tKv_vq Aew⁻Z?
 K) Lj³bv I h³kv³i
 L) XivKv I g³vM³tĀ
 M) cvebv I vmi vRM³tĀ
 N) evi kv³tj
- 6/ vntj U tevt³bi gvU i aib tKgb?
 K) t³vAvk t³tK GtUj
 L) te³tj -t³vAvk
 M) GtUj
 N) te³tj
- 7/ gazj Mo AĀtj i gvU tKgb?
 K) ų³vi xq
 L) A³uq
 M) jeYv³
 N) ubi t³cų

8/ eti>`AAtj 56 fM tKib&ai#bi Rng?

- K) ubPzRng
- L) gvSwii ubPzRng
- M) DPeRng
- N) gvSwii DPeRng



Pgršgji`iqb

msiŋB I iPbvj-K ckae

- 1/ Zicgvŋvi Zvi Ztg`i Dci ubfP Kti DvM` i tkŋYieb`im mg n eYŋv Kiŋj|
- 2/ DvM` Rxeŋb cmbi fvgKv m=útk`Avtj iPbv Kiŋj|
- 3/ DvM` cŋ`^b cŋµqvi cwiŋekxq Zvrch`eŋStq ejŋj|
- 4/ AvZvi³ eb ŋbatbi dtj evqgŮtj CO₂ I O₂ Gi fvi mg` Kxfvte ŋebó nq Zv e`vL`v Kiŋj|

- 5/ cwi tek bwi Zi Df`k` I c`vb bwi Z`tj vi bvg Dc`vcb Ki ly|
- 6/ Kij tevtkLx So I UfYwv mbtq Avtj vPbv Ki ly|
- 7/ cwi tek meAvb ej tZ Kx tevSvq Avtj vPbv Ki ly|
- 8/ Holocoenotic ej tZ Kx tevSvq e`vL`v Ki ly|
- 9/ Dw`c Rxe`b cmbi Zvrch`egstq ej ly|
- 10/ `RweK Dcv`vb m`utK`hv Rv`bb Dc`vcb Ki ly|
- 11/ Lv`-`kKj I Lv`-Rvtj i cv`R` egstq ej ly|
- 12/ BtKvj wRK`vj wciwgW Kx? D`vni Ymn GKwL Lvov BtKvj wRK`vj wciwg`wi eY`v w`b|
- 13/ mKj BtKvmt`÷g m`z`tk`Avbj vf Kiv Avek`K tKb Zv egstq ej ly|
- 14/ c`kwZK I Kw`g BtKvmt`÷g ej tZ Kx tevSvq e`vLv Ki ly|
- 15/ ebR I ZY`fugi c`wgK Drcv`Kmg tni bvg D`tj-L Ki ly|
- 16/ gi`R I Rj R BtKvmt`÷tgi g`ta` Z`z`big j K w`tk-IY w`b|
- 17/ me`R Dw`c Kxfi`te `vbxq Rj evqyc`f`meZ Kti Zv eY`v Ki ly|
- 18/ gwLi `lqti`vta e`t`ji fvgKv eY`v Ki ly|
- 19/ cwi tek bwi Zi g L` Df`k`mg n Dc`vcb Ki ly|
- 20/ tKvb t`tki cwi tekMZ Ae`v wKtmi Dci wbf`P Kti egstq ej ly|
- 21/ grm` I ci m`u` bwi Zi c`vb w`K`tj v D`tj-L Ki ly|
- 22/ Kij w`kvLx I Ufb`wvi msu`tjB weeiY w`b|
- 23/ A`f`v`evcbwL.cwi tek AAj mg tni bvg Zv`i` p`H gvbm n D`tj-L Ki ly|
- 24/ `Re c`v`_`t`_o` we`g`vb Ggb KwL.cwi tek`tj vi bvg D`tj-L Ki ly|
- 25/ me`t`ptq AvqZ`tb eo KwL.cwi tek`ki bvg Gj vKv m n Dc`vcb Ki ly|



D`E`igjv

cW - 1.1

- 1. K 2. M 3. L 4. N 5. K 6. N 7. L 8. K

cW - 1.2

- 1. M 2. K 3. N 4. L 5. M 6. K

Kv.1.1 cju Dbqb ž

cW - 1.3

1. M 2. K 3. L 4. M 5. L 6. K 7. M

cW - 1.4

1. M 2. M 3. L 4. N 5. K 6. M 7. L

cW - 1.5

1. M 2. N 3. L 4. K 5. N 6. K

cW - 1.6

1. K 2. M 3. L 4. N 5. L 6. K 7. L 8. L

mjo Kti | Aek` AtbK mgq Gme Dcv`vb cwi tetki Ab`vb` Dcv`vbi mit_ ugfk
AvZvi` neluqvrl `Zvi Kti |

- (L) `Re ubabthvM` `HK (Biodegradable pollutants) t thgbt Mpcvij Z ci ev mivmRK
c0Yxi eR`hv c0KwZKfite ev c0uqvRvZKiYi gra`tg `Z cPbkxj | G,tjv
c0KwZtZ PmuKviti AveZ0thvM | dtj cPbmuqv tkl ntj Gt`i nelv`KiY qJgZv
tjvc cvq | Aek` cwi tetk `HK c`vt`P gvIv AZ`waK ntj A`P `Re ubab qJgZv
Qvvo`q tMtj `Re ubabthvM` `FYI mgm`vi mjo Kitz cvti |

cvfVei gj`iqb 2.1



mivK DEti i cvfk uUK uPy (✓) w`b |

1/ Avb weAvtbi DrKI Zvi mit_ mit_ Kx NU0?

- K) cwi tetki DrKI`nvab ntZ0
- L) gvb`i `tL `yRv evot0
- M) gvb`i Avig Avtqk I cwi tetki ` IY evot0
- N) m`zt` i weKvk NU0

2/ cwi tetki ` IY KLB c0KUZv jvf Kti?

- K) mjo i Av`Kij t`tk
- L) c0`li hM t`tk
- M) eZ0vb mgq t`tk
- N) Av`tbi e`envi I Kj Kvi Lvbv Movi ci t`tk

3/ `IKwfinEK ` IYi tkwweb`vfm DcvE Kx Kx?

- K) `t, cvi`, CO₂ BZ`w`
- L) evqycmb, gmU
- M) Kj Kvi Lvbv, D`ovRvrvR, h`shvb BZ`w` i ka
- N) Kvi Lvbv, AvbweK P`z` BZ`w` t`tk vbtmZ Zvc

4/ %Re ubabthvM` `wZ c`vt`P Kx nq?

- K) mivvi Yfite qJqc0B nq bv
- L) axi MvZtZ qJqc0B nq
- M) mivvi Yfite ev c0uqvRvZi gra`tg qJqc0B nq
- N) c0KwZtZ PmuKviti AveZ0 AthvM`

5/ AvbabthvM` `Yxq c`vt`P Kx nq?

- K) c0KwZtZ PmuKviti AveZ0bi gra`tg cwi tetk vdti Avtm
- L) Rxe-f; i vmbK Pmu ev Lv`wkKtj c0ek Kti
- M) c0bmuqv tkl ntj nelv`Zv tjvc cvq
- N) tKvb `RweK mgm`v mjo Kti bv

6/ **Gti vtmj m t** Gti vtmj mRvZxq mvgM0 t_#K mvari YZ Kivb I Zij Dfquea Dcv`vbB evqjZ fvmgub _vtK| G mKj `te` wR¼, `v, Zivq, tjvrv, BZ`w` MWZ melv³ thSMK Dcv`vb me`gub _vKvq Zv evqjZ `tY NUvq| Gme `te`i gta` DtjLthvM` n`Q cñvab mvgM0, KxU I RievYvK, kvZvZc ubqšjY e`eüz CFCs, ev tkvtiv-tdvtiv-KveB BZ`w` |

7/ **Riek`tY t** cKwZtZ A#bK`Riek Dcv`vb itqtQ hv`i Dcv`wZi Kvi tY evqy`wZ nq, thgbt e`vKtUvi qv I QIvtKi ti Yy(Spores), Ci vMti Yy(Pollen grains) BZ`w` |

evqy`HjYi cñvab ev`ie`iz.

thtnZzevqycñqB w`Zve`vq _vtK bv tm Kvi tY evqy`tY I w`Zve`vq meivR Kti bv| `HjYi me`iz. mvari Yfite Avenl qvi Ae`v, evqy` MwZteM, `tY Dcv`vtbi ivmivqubK`pZv (w`Zve`v) Ges Zvt`i AYj AvKwZi Dci wbfPkvj |

evqy`HjYi mtePP gviv mvari Yfite `HjYi Dm Gj vKvq t`Lv hvq Ges GuU NtU mvari Yfite i wI Kvj xb mgq hLb fvgmsj MeevqyEaYvKviki evqyAtc¶v kvZj Zi _vtK| wKš` bMixi tarqv, kv³ Drcv`b tkv`a Ges BtUi fvUv t_#K DvI Z mj dvi-WvB-A·vBW M`vm, nvBtWvKveB t_#K m0 I tRvb I bMixi tarqv t_#K wbtmZ bvBtUtRb A·vBW Dm`j t_#K kZ kZ wKtj wguvi `ieZP`vte evqy`HjYi Kvi Y nZ t`Lv hvq |

evqy`HjYi cñve

`vbxq I AvAwj K chq evqy`tYxq c`v_°tm Gj vKvi tgN, epociZ, Zic cñvab BZ`w` tZ cñveZB NUvtZ . iZcy°fvqKv ivLtZ cñvi | GuU meRb`xKZ.th, bMi Dm t_#K wbtmZ A#bK evqexq `tYe` bMixi evqyKtqK wvMw0 tmj wmqvq chšI DEBKi tY m¶g Ges bMi tKw`K G aitbi DEvc cvkPZ°evqyUtj Qwotq cotZ cñvi |

gube`tni I ci avZe e`i cñve

evqyUtj Dcv`Z wvfbvavZagtni KYv gvbe`tn ti vM mpo`i Rb``vqx| fwi avZe KYv GRgv, Kwk, cladm Ges Mjvi Ab`vb` ti vMi Rb``vqx| mxmv eq° gvbjmi`t vfwek Kvhtej xi e`vNvZ NUvq Ges gw`° meKj Kti gZžchšI NUvtZ cñvi | K`wvqvg D`P i³Pvc Ges ü`ti vM mpo`tZ mrvqZv Kti |

M`vmaq c`vt`P cñve

gvby I cñvi Rb``co2 GKwU klmtivax M`vm| evqyUtj co2 Gi cñviYv ep`x tctj Mib nvdM cñZmuvri Kvi tY cñvexi Zvcgviv tetö hvte| dtj Rj evqjZ NUvte e`vcK cñveZB| tgiyAAtj i eid Mtj mivMti cñvbi D`PZv tetö hvte| Zvj tq hvte cñvexi eü wvAj | evqjZ co Gi Awak` Ges bvBtUtRtbi A·vBWmgn i t³i Av` tRb enb ¶gZv nvm Kti | dtj gvvaiv. `pñvbxZv, Ges Zj tctU e`v_v AbjZ nq| evqjZ so2 Gi Awak` nvcibx, ešKvBvUvm, cñvZ. cladm mspvšI ti vMi Rb` t`q| evZvM tebRvcvBvib nvBtWvKvešbi Dcv`wZ K`vYvi mpo`i Rb``vqx| evqy` Riek Dcv`vbNUvZ `tY, h_vt e`vKtUvi qv, QIvK, ci vMti YyBZ`w` G`vj wRRvBZ ti vMi (thgbt nvcibx, ešKvBvUvm BZ`w`) Ab`Zg Kvi Y wntmte wetePZ |

evqyUtj Dcv`Z wvfbvavZagtni KYv gvbe`tn ti vM mpo`i Rb``vqx| fwi avZe KYv GRgv, Kwk, cladm Ges Mjvi Ab`vb` ti vMi Rb``vqx|

GmW epj

newfbae A- vBW wełkI Kti
bvBtUttRb I muj dvi RvZxq
A- vBtWi M'im ełoi cwbi
mvt_ ugij Z ntq bvBtUK I
muj wclDwi K GmłW cwi YZ
nq hv ōGmłW ełoi bvtg
cwi wPZ|

newfbae A- vBW wełkI Kti bvBtUttRb I muj dvi RvZxq A- vBtWi M'im ełoi cwbi mvt_ ugij Z ntq bvBtUK I muj wclDwi K GmłW cwi YZ nq hv ōGmłW ełoi bvtg cwi wPZ| GmłW ełoi gwł I cwbi p^H nwm Kti | dtj msłkō GjvKv DmłC I cōYxKtji emełtmi AłhvM' ntq cto| GmłW ełoi dtj gvtQi goK t'Lv t'q Ges cRbb cōłqv newNz nq| eZgłv cł extZ wktř vbz t'łk GmłW ełoi GKłU cłKU mgm'v wntmte t'Lv w'łqtQ| fviłzi g_łvq AewZ wktř -Kvi Lvbv t'łk wbtmZ newfbae M'im I GmłW ełoi KviłY AvMłi ZvRgnj Zvi D³/₄ j Zv nvi vł'Q|

DmłC i lci eqyłYi cłve

evqexq `IY mełR DmłC I km' Drcv`łbi Rb'I ųłZKi | big cvZihų DmłC, thgbt gj-v, MvRi, tj Uza Ges newfbae uel Rıex mcłuk DmłC i Drcv`bkxj Zv `łZ eqył KviłY e'vnZ nq| evZvfm LubR `łe'i atj vevij Awak' ntj DmłC i RıeK włqv-Kłg'e'vNvZ NłU| bvBtUttRb A- vBtWi cōZwłqv DmłC i cłSiv, tKvıvmm, wQU-cov (Narcotic spot) cvZvi Wmł I wKbvıvq cto hvl qv cłwZ. DcmM' t'Lv hvq| `łZ c'vł'P KYv wKueZ' DmłC i cvZıvq cto cłI ōk'ełųi KviY NUvq| dtj M'vıvq Av'vb-cōvb (Gas exchange), cwbi avıY ųłgZv I Ab'vb' kvıxıełEq kvhıeg e'vnZ nq| G KviłYB wktř Kvi Lvbvi wKueZ' vłb MvtQi cvZv Siv, Wmł i wKłtq hvl qv, cvZv I dtj i ųłZ młō nı qv BZ'w' Amıeav t'Lv hvq| evZvfm SO₂ Gi Awak' NUtj Av¹/₂ j RvZxq DmłC, Zıv I AvZv dtj i cvZv njy ntq (Necrosis) hvq| dtj Drcv`b ųłgZv e'vnZ nq| mł gvtıvı IłRıv (0.02- 50 wııcGg) ZıvıvK, Ułgtıv, mıg, cvBb BZ'w' MvtQi ųłZ mıvab Kti |

eqyłYi cłZKvi

ųłZ' KYv RvZxq `łK I newfbae ųłZKvi K M'vłmi cłve t'łk evqgłjłK cwi "ŌbeıvLvi Rb' eZgłv newfbae xıZi Dmłeb ntqtQ| G, tj vi gta" -

- wMłgtbi cłe' `łZ evqłK młZ' cłKıłōi (Porous chamber) wFZi w'łq cēvnZ Kti wlv³ ųłZ' KYv cłKKıY|
- `łZ evqłK cwbi Uvl qvtıi tFZi w'łq cēvnZ Kti `ēYıq `łZ c'v' cłKKıY|
- _ıj ŌıKbvi (Bag filters) gva'łg evqy' aıj KYv cwi łkvab Kiv|
- BŪw÷łıj Błj KłŪ÷włK SiYvi gva'łg (Industrial electrostratic precipitation) łııqv RvZxq `łYi cvZb NUvıv BZ'w' Dłj -LłhvM'|

G, tj v Ōıvıv AıZwı³ mZKłıvıvK e'e'v wntmte hZ'ı mıe Kqıv, tclıııj qvg cłwZ Rıevkł Rıj wıbi e'envı KgtZ nte| wktř e'e'v wntmte Rıe'ıy, evqłj (Wind mill), łmłı kv³ BZ'w' i e'envı evıvZ nte|



Abłıj b (Activity) t evsıvł'łk kni I MłgvAłj i gta' tKıv vq evqy' IY teıw| evqy' IY nwmKłı Kx Kx c'łųc MłıY Kiv cłqvRb etj Avıvıv gıb Kti b Zv weeZ Kııb|

cıvłVıi gj'ıqb 2.2

mvf_ ugfk b`x ev mvlMti cmbtK `wZ Ki tQ| GmKj thSMK imvqvBK `te`i gta`
DDT AZ`š k w³kyj x, `vqx Ges qWZKi | KviY DDT ubR`wKsev c0KuzK c0uqv
gva`tg f f^{1/2} hvqbr ev webó nq br| dtj `xNq` b afi Gi c0Zuqv eRvq_vtK|

- 4/ tZRw`lj eR`Q(Radioactive waste) t tZRw`lj tgj e`envi RwbZ mkí I cvigvYueK Pj` kxZj ivLvi Rb` me`v VvUv cmbi c0v n b wOZ ivLv nq| e`envi vt`š GB cmb DEB Ae`vq b`x ev Ab` tKv`br Rj vktq cotj cmbi Zvcgv`v evx cvq|
- 5/ tZj RvZiq `HY t tZtj i U`v`vi, Kj Kvi Lvbr t`tK temotq Avm tZj ev Ab` th tKv`br Kvi tY tZj wbtmZ ntq cmbtZ cotj Zv `wZ nq|
- 6/ wUvi tRÈ t eZgvb h`M Kvcó favqi cvDWi mvgM0 hv wUvi tRÈ brtg cwi wPZ, Rj R cwi tetk wgvkZ ntq `tY NUvq|
- 7/ Rj R Dm`c t A`bK mgq Rj R Dm`c mgr cmb `tYi Rb` `vqx| Giv c`kz ev Rj vktqi e`envi Dc`th wMzv Kgvq| dtj A`bK mgq bre`Zv, gvQ aiv I Ab`vb` e`envi i t`q`f c0Ze`JKZv m`pó nq|

cwb `HYi c0ve

- 1/ bvj v-b`gvi `wZ cmb e`envi Ktj iv, UvBdtqW, Avgvkq g`vtj wqv c0vZ tiv`Mi m`pó Kti| GB cmbtZ `RueK `te`i Rvi tYi dtj c0z` O₂ e`wqZ nq Ges CO₂ Gi cwi gvY evx cvq| dtj cmbtZ `keij, AYRxe I dvB`Uvc`wS`U`bi Awak` NtU| cmbtZ `exfZ O₂ Gi `f Zv gvQ, Ab`vb` Rj R c0Yx I A`bK Dm`c`i Rb` qWZKi |
- 2/ Kj Kvi Lvbr AveR`vq mqvbr BW, tdbj, G`vtgmbqv c0vZ wlv³ `è` _vKvq Zv cmbi AYRxe I Ab`vb` R`x`ei Rb` qWZKi | Z`gwi G`tj v Lv`-wKtj c0ek Kti Rxe t`tn bvbwea RuUj Zv m`pó Kti | Btj KtU`c-wS Kvi Lvbr ntZ wMz` fwi avZl mqvbr BW cmbi qWZi I A`z`i evx Kti | K`wK tmwW I tKwi b d`v`wí ntZ wMz` AveR`vq cvi` RvZiq `te`i c0z`-vtK hv `j R I Rj R c0Yx Rb` úgvk`tfc|
- 3/ KxUv`kK `è` Lv`-wKtj c0ek Kti gvbe`tn K`v`Yvi, `wqy e`p`Zv, wj DKwgvq c0vZ tiv`Mi Rb` t`q| A`bK KxUv`kK w`tkl Kti DDTi c0fite dvB`Uvc`wS`U`bi mvj vKms`tk-ly qWZv tj vc cvq| eU Rj R c0Yx i KkUv a`sm nq| GbRvBg c0uqv wvNvz nevi Kvi tY cwlLi tMvbr wKv`tki c_`i`y nq| dtj wv`c`z`t`Y wej`^N`t`U| wv`tgí K`v`wqvg AveiY µgk cvZjv ntq GK mgq a`f`Yi wKv`k eU ntq hvq| Gfite c`w`ex t`tK eU c0Rwzi cwl wej`j ntq tQ|
- 4/ cvigvYueK kw³ tK`f`i eR`Q Dm`c I c0Yx Df`qi Rb`B tZRw`lj Zv RwbZ wec` m`pó Kti | tZRw`lj c`v`_P Abz`et`ki dtj wki gZ`i nvi evx cvq| Zvcgv`v evx RwbZ Kvi tY A`bK gv`Qí wlv d`zU tcvr tei ntj I ch`B Aw` tRb I Lv`v`fite gvi v hvq| gv`Qí c0Rbb I ti w c0Z`ti va qWZv tj vc cvq|
- 5/ tZj RvZiq `I`Yi dtj cmbi Dc`ti tZtj i Av`li Y cti | Av`li tYi c`j`z`i Aek` wbtmZ tZtj i gv`vi Dci wbf`kxj | KzqZ I Biv`ki h`x` c0z` tZj Dcmwix Gj vKvq Qm`otq cto| GtZ c0z` cwl, gvQ I Ab`vb` mvgv`K c0Yx e`vck qWZ mwaZ ntq tQ| Gmgtq Biv`k eU wKj v`2 m`š`t`bi Rb`v`ntq tQ etj I c0Kv`k|
- 6/ cmbtZ wUvi tR`Èi Dc`w`wZ AYR`x`ei evx NUvq Ges BDU`d`t`Kkb c0uqv Zim`šZ Kti |

cwb `HYi c0ZKvi

KxUv`kK `è` Lv`-wKtj c0ek Kti gvbe`tn K`v`Yvi, `wqy e`p`Zv, wj Kwgvq c0vZ tiv`Mi Rb` t`q A`bK KxUv`kK w`tkl Kti DDTi c0fite dvB`Uvc`wS`U`bi mvj vK- ms`tk-ly qWZv tj vc cvq

Kwl.1 c j-x Dbqob -ž

- 1/ " " mšZ cqtčŸj x e"envi KižZ nte| "RueK čŸŸqvi gra"tg b"Ÿv I cqtčŸj xi AveRŸtK "RueK mŸti i fcvšŸi KižZ nte|
- 2/ cmb wei x i vLžZ nŸj ŸkŸ Kvi Lvrvri AveRŸtK hŸZŸ tdj v eÜ KižZ nte| G, tj v ŸbR "čŸŸŸq "Re ŸbabŸhŸM" (Biodegradable) Dcv"vb A_er cŸtčŸŸqviRvZ- KižZi (Recycling) e"e"v KižZ nte|
- 3/ "ŸqŸ/ AŸŸqŸ i vŸvqŸbK I KŸUvŸkŸKi e"envi hv Lv"ŸŸkKŸj čŸek KŸi, ŸbŸl x tNvI Yv KižZ nte| hZ` i mše mgŸšZ tcvKŸvŸKo čŸZŸiva e"e"v (Integrated Pest Mangement, IPM) AŸvŸi Y KižZ nte| i vŸvqŸbK mŸŸi i cŸi ežZŸM"Ÿm I "RueKmvi (Biofertilizer) Gi e"envi evovžZ nte|
- 4/ mZKŸvi mŸŸ_ tZRŸŸŸ c`vŸ_Ÿ Acmvi Y KižZ nte Ges GRb" DbžZi čŸŸŸ e"envi ŸbŸžZ KižZ nte|
- 5/ GŸvov AŸbK DŸŸŸ ŸbŸRiv `ŸŸZ c`v_ŸMŸY KŸi cmbžZ `ŸŸYi gvŸv KgvžZ mŸŸg| thgb t KPžx cvbv cmbžZ `eŸfZ avZžn eü Ÿel v³ c`v_ŸbgŸ KižZ mŸŸg|

hZ`i mše mgŸšZ tcvKŸvŸKo čŸZŸiva e"e"v (Integrated Pest Mangement, IPM) AŸvŸi Y KižZ nte| i vŸvqŸbK mŸŸi i cŸi ežZŸM"Ÿm I "RueKmvi (Biofertilizer) Gi e"envi evovžZ nte|

cvŸVŸi gj"iqb 2.3

mŸŸK DŸžŸi i cvŸk ŸUK ŸPŸ (✓) Ÿ`b|



- 1/ tKv_vq cll_exi cllq 70 fivM Rj i vki e`vB NtU#Q?
 - K) tWvev, cKz, Lvj I mefj
 - L) mivMi-gnivmMti
 - M) b`x, byj v, n#`
 - N) fMf`cmbtZ

- 2/ tKvbU mivK bq?
 - K) e`enwi K Ktqi thvM`Zv nvi vj cmb`#Z nq
 - L) mKj Rj vktqi B mngZ eR`c#tclqvKi #Yi qjgZv_vfK
 - M) `tY cmbi is eY`#` tKvb&cvi eZB NtU bv
 - N) vki Kvi Lvvi eR`mqvqvBW, tclbj, G`vtgmbqv cfvZ meLv`e`_vfK|

- 3/ KivbvtKi gta` DDT metPtq qvZKvi K tKb?
 - K) GivU cKvZK clqvqi gva`tg qjgcB nq bv
 - L) GivU cmbi miv` mntR vgtk hvq
 - M) GivU qY`vqx A_P Avak Kvhrix
 - N) GivU `Mthj I cBbkxj

- 4/ `#Z cmbi Dci nij Kv Av`li Y cto tKb?
 - K) mivUvitrEi Kvi #Y
 - L) Rj R Div`c RvbZ `tYi dtj
 - M) tZj RvZxq c`vt`P Kvi #Y
 - N) b`gvi `tY thvM nvi dtj

- 5/ Btj KtU#t-cvUs Kvi Lvbv ntZ vbmZ `tY cmbi Kx cvi eZB Avtb?
 - K) cvi ` RvZxq Dcv`v#bi evx NtU
 - L) Av` trtbi cvi gvY Kgvq
 - M) AYRxe I divBtUvcvsvtbi Avak` NUvq
 - N) qvi Zj I AvZj evx Kti

- 6/ cvLi GbRvBg clqv I tMbvW meKv#ki c_ ifx nq tKb?
 - K) mivBqvBtWi Kvi #Y
 - L) DDTi cfvte
 - M) cmbtZ mivUvitrEi Kvi #Y
 - N) K`vj vktgti Afvte

cw 2.4 RbmsL`v I cvi tek `tY

G cvV tk#I Avcib -



Kvi Lvbr DftqB`z emotq Zjt0 kw³ e`enitii cwi gvY Ges evqy I tYi DcKiY| Rvcrfb Aew`Z mekciitek MtelYi KZ⁹ (Global Environmental Research Authority at Japan) 1993 mtj GK mgr⁹lvq cKvik Kti th, Gukqvi t`k₃ t₁K mbM² CO₂ Gi cwi gvY eZ⁹vb`ktKB kZKiv 30 fM epx cite Ges Avb⁹WZK niti wgt_b M'v⁹mi epx Nute| Avi G`⁹Uv M'v⁹mB evqy`I tYi Ab`Zg t⁹mcv| meAvbit`i gtZ c₁exi evqy⁹Ujt BtZvgt`B kZKiv 25 fM CO₂ Gi AwaK` NtU⁹tQ| RbmsLv epx RvbZKvi tY CO₂ Gi cwi gvY Avi I evotj Zv evqy tYi t⁹t⁹ Z_v Mib n⁹DR c⁹Z⁹lvqv NUt⁹bvi gva`tg gvi vK wech⁹ tW⁹tK Avbte|

Kul Drcv`b I`IY

RbmsLv epx i mt₁ gub⁹jt i Lv` P⁹mn`v evotQ| GB ewaZ Lv` P⁹mn`v t⁹gU⁹t⁹bvi Rb` gub⁹jt D⁹teb Kti tQ Dakx Rv⁹Zi dmj | dj b epx i Rb` e`en⁹vi Ki tQ mvi I KxU⁹b⁹vkK| GK mgr⁹lvq t`Lv tM⁹tQ tKvb dmtj i Drcv`b w₃ Y evotZ ntj mvi, KxU⁹b⁹vkK I kw³ e`enitii cwi gvY 10₃ Y evotZ nt`Q| dtj evqyl c₁vb K⁹jt Z nt`Q| Av`⁹Rj v⁹ RvgtZ avb Pvl t₁K mbM² nt`Q wgt_b M'v⁹mi| GB M'v⁹mi Mib n⁹DR c⁹Z⁹lvqv NUt⁹bvi ⁹IgZv CO₂ A⁹tc⁹lv 10₃ Y gZv⁹sti n⁹Rvi ₃ Y tevk| BtZvgt`B we⁹tkj kZKiv 17 fM wgt_b av⁹bi Rvgt₁K Avm⁹tQ| Avi I RbmsLv epx t⁹ctj av⁹bi Drcv`b evotZ nte| tmB mt₁ wgt_b Drcv`bI t⁹to h⁹te| b⁹vBU⁹m A- vBW (N₂O) Av⁹t⁹K⁹U kw³kvj x Mib n⁹DR M'v⁹mi| Gi cwi gvY erm⁹t⁹i 0.2 t₁K 0.3 fM n⁹ti evotQ Ges Gi Mib n⁹DR c⁹Z⁹lvqv NUt⁹bvi ⁹IgZv CO₂ Gi P⁹vB⁹Z 180 t₁K 300 fM tevk| Avi AwaK⁹ N₂O M'v⁹mB mbM² nq` R⁹veK D⁹m t₁K| Gi g⁹ta` km⁹t⁹t⁹ e`euZ b⁹vB⁹U⁹t⁹R⁹b⁹R⁹vbZ mt⁹i i e`en⁹vi t₁K m⁹o nq c⁹q GK c⁹Agisk|

Av`⁹Rj v⁹ RvgtZ avb Pvl t₁K mbM² nt`Q wgt_b M'v⁹mi| GB M'v⁹mi Mib n⁹DR c⁹Z⁹lvqv NUt⁹bvi ⁹IgZv CO₂ A⁹tc⁹lv 10₃ Y gZv⁹sti n⁹Rvi ₃ Y tevk| BtZvgt`B we⁹tkj kZKiv 17 fM wgt_b av⁹bi Rvgt₁K Avm⁹tQ|

D⁹w⁹ m⁹vtj vK⁹m⁹st⁹k-IY c⁹lvqv gva`tg eQ⁹t⁹i c⁹q 4-9x10¹¹ tK⁹W CO₂ M⁹h⁹Y K⁹t⁹i Ges c⁹q mg cwi gvY O₂ Z⁹W K⁹t⁹i |

eb v⁹bab I RbmsLv RvbZ`IY

AvR c₁extZ th n⁹ti RbmsLv evotQ Zvi t⁹P⁹t⁹q AwaK M⁹vZ⁹t eb m⁹u` a⁹ysm nt`Q| Gi gtj it⁹t⁹Q gub⁹jt i bZ⁹ emiZ, M⁹lvqY, bMi c⁹E⁹b BZ`w⁹ KviY| D⁹w⁹ m⁹vtj vK⁹m⁹st⁹k IY c⁹lvqv gva`tg eQ⁹t⁹i c⁹q 4-9x10¹¹ tK⁹W CO₂ M⁹h⁹Y K⁹t⁹i Ges c⁹q mg cwi gvY O₂ Z⁹W K⁹t⁹i | Avi G O₂ nt`Q mKj c⁹lvxi k⁹h⁹b⁹K⁹v⁹h⁹c⁹vi P⁹v⁹ b⁹vi D⁹cv`vb| m⁹z⁹i vs AZ`waK RbmsLv i P⁹tc eb m⁹u` a⁹ysm ntj Zv c⁹lvYR cwi tetki wech⁹ tW⁹tK Avbte|

RbmsLv I w⁹kvb RvbZ`IY

evqexq cwi tek` I tYi c⁹lvb D⁹cv`vb w⁹nt⁹te CO₂, CFC_s, wgt_b BZ`w⁹ tK`vqx Kiv nq Ges Gi AwaK⁹sk w⁹kv⁹vbZ t⁹tki D⁹cv⁹Z etj B we⁹te⁹PZ| w⁹K⁹ eZ⁹vtb RbmsLv⁹ev⁹jt t`k₃ t₁v⁹Z GK⁹ tK thgb RbmsLv evotQ Ab⁹ tK A⁹W⁹ZK KgR⁹v⁹U⁹l`⁹Z⁹vi mt₁ t⁹to P⁹t⁹tQ| P⁹xb 120 tK⁹U RbmsLv Aa⁹vt Z c₁exi w⁹Z⁹xq ep⁹Eg K⁹qv Drcv`bK⁹vix, 6⁹ tZj Drcv`bK⁹vix Ges 4⁹ve`yZ Drcv`bK⁹vix t`k w⁹nt⁹te we⁹te⁹PZ| eZ⁹vtb Zvi A⁹W⁹ZK c⁹lv⁹ni n⁹ti kZKiv c⁹q 8 fM| g⁹ ev⁹Rvi A⁹W⁹ZK KgR⁹v⁹U⁹i Av⁹Z⁹vq P⁹xb⁹tK Zvi A⁹W⁹ZK KgR⁹v⁹U eR⁹vq i⁹lv⁹i Rb` Af`⁹sl⁹xy kw³ N⁹U⁹vZ t⁹g⁹v⁹te⁹vi Rb` Avi I K⁹qv I tZj Av⁹g`vbx Ki⁹tZ nt`Q| 1993 mtj e⁹v⁹t⁹K Ab⁹vZ Aven⁹l⁹qv Av⁹Av⁹ij K mt⁹st⁹ t⁹b Dc`⁹w⁹Z Z` Ab⁹lvqx P⁹xb BtZvgt`B c₁exi 11% CO₂ Drcv`t⁹bi gva`tg h⁹Y i⁹v⁹ I i⁹w⁹kv⁹ c⁹t⁹i B Z⁹Z⁹xq`⁹vb Ae`⁹vb Ki⁹tQ| G⁹k⁹xq t`k₃ t₁v⁹ BtZvgt` kZKiv 25% Mib n⁹DR M'v⁹m Drcv`b K⁹t⁹i P⁹t⁹tQ h⁹vi A⁹ta⁹R⁹B CO₂| w⁹K⁹ th n⁹ti Gukqvi RbmsLv evotQ Ges w⁹kv⁹vb NU⁹tQ Z⁹tZ L⁹g k⁹v⁹NB Gukqvb t`kmg⁹ Av⁹tg⁹vi K⁹v I BD⁹t⁹vc⁹xq⁹ kmg⁹ni m⁹st⁹ Z`⁹IY gv⁹vtKI Q⁹mo⁹tq h⁹te etj Av⁹k⁹v⁹ Kiv nt`Q|



mıWK DĚřii cıřk ıUK ıPıı (✓) ıı b|

- 1| řKı_vq RbmsL`ıv RıbZ cıı řek `ıY řek NřU?
 - K) Dbřř ř`řk
 - L) Rbeıj Dbřřbkıj ř`řk
 - M) Dbřř I Abřřř mKj ř`řkB
 - N) Kg RbmsL`ıv Aaıj Z ř`řk

- 2| řKıvıU mıWK bq?
 - K) eım DcřřıMı Mı gıvřıı i Aıııvq AıřřkRıbZ AııKıı
 - L) Pıı, fıı Z, cııK`ııb, Břř`řřbııkqv I evsj vř`řk cıı_eri AřřřKıı I řek řj vřKıı eım
 - M) Dbřřbkıj ř`řkı epr bMııı GK ZZıqısk řj vK ew`ėıııı
 - N.) eııř RbmsL`ıv I ıkıı -Kıı Lıvı DřřqB cıı řek ` I řYı Kıı Y

- 3| Rj veı avřıı Rııg ř`řk Kx ııbMřř nq?
 - K) CO₂
 - L) CO
 - M) CH₄
 - N) O₂

- 4| řKıvıU meřřřř řek Mııı nıDR Břřd± NUıq?
 - K) CO₂
 - L) CH₄
 - M) CFC
 - N) NO₂

- 5| ebřřıg ařřřıı Kıı řY evřřřř ıKřřıı Afıı nře?
 - K) CO₂
 - L) O₂
 - M) N₂
 - N) H₂

- 6| Dbřřbkıj Rbeıj ř`k_řjıı gřř meřřřř řek cıı řek `ıY NUıř`Q řKıv ř`k?
 - K) fıı Z
 - L) evsj vř`k
 - M) Pııb
 - N) Břř`řřbııkqv

- 7| řaycřřřıı Dřřřeb bq RbmsL`ıv I `ıY mgııv řııKııřjıı meıı AıřřM cııqıRb řKıvıU?
 - K) epr bMıııqb I Kj Kıı Lıvı Mřřo řZııı
 - L) aııřř gřřřeva RııMřřř řZııı
 - M) AııK dııj Drcıı`b
 - N) `bııZK, A_řııZK, AıBbMZ I mııııRK mZKřřı Mřřo řZııı

cıı 2.5 gııĚKıı `ıY (Soil Pollution)

weirfbæKvi tY gweKv`LY msNiuZ nq| eb`v, b`xfv½b, AwZewó, evqzðvn cfiuZi Kvi tY weirfbæaitbi figq NtU| Gme figq tji DeP fig dmj Pti Abi ntq cto| b`b`xi µgeaðvb cov Ges cmvox Xtj DeP fig tZ AbP ewij Rgv BZ`vir Dti LthM`| gweKv`xN` mgq cmbi ubtP cto`vKv`Ksev` tZ` cimb` Øviv` tmP` cØvfb| gweKv``LY NUtZ` cvti| Kul` tji` Aciv` Kvi` Z` fite` i` vmiqbK` mvi` I` KxUviktKi` e` envi` cØZ` bqZB` gweKv`` tZ` Kti` Z` tQ| Avc` biktKi` AwakvskB` weirfbæfite` gweKvq``xN` b` Ae`vb` Kti` hv` gweKvi` , Yvej` tZ` cØU` qmZKi` cfi`ve` tdtj` | Gt`i` cfi`ve` gmu` tZ` Ae`vb` Kvi` x` Dckvi` x` RxeYjv` tetP` _vKtZ` cvti` b| Avgiv` Rmb, GK` tKwR` DeP` gmu` tZ` mte` P` 2` uUj` qb` e`vKtUvi` qv, 400` uUj` qb` QIvK, 50` uUj` qb` k`v`l` j`v` Ges` 30` uUj` qb` t`cØ` Uv` Rvqimn` Ab`vb` eo` I` q` a` gweKv` Rxe` evm` Kti` | gweKvq` evqz` Uj` xq` bvtU` tRb` msthv` Rbmn` gweKv`` weirfbæi` vmiqbK` weir` qv` msNU` t`b` Gt`i` fig` Kv` LøB` , i` z` cy` KxUviktK` I` i` vmiqbK` mvi` e` envi` t` Gt`i` gZz` NUvq` gmu` k`³` ntq` Dtv` Ges` DeP` Zv` nrm` ciq` |

gweKvq` gj- Avc` biktKi` (Pesticide) kZKiv` 75-100` fiM` cfi`ve` bó` ntZ` th` cwi` gvY` mgq` j` vtM` Zv` ubtPi` mvi` YtZ` cØ` E` ntj` v-

Avc` biktKi` bvg	cfi`ve` bó` ntZ` cØqv` Rbxq` mgq` (ermi)	Avc` biktKi` bvg	cfi`ve` bó` ntZ` cØqv` Rbxq` mgq` (gvm)
Gj` wWb	3	Wiqv`wRbb	3
tKvi` tWb	5	g`vj` u` qb` I` c`vi` u` qb`	0.25
wW` wW` uU	4-10	t`cØ` cwi` Rb` I` u`c` tKvi` `ig`	18
tn` bvt` Kvi	2	wmgv`wRb	12
wj` tU`b	3	2,4,5` uU	5
wW` BGj` wWb	3	Gt`Uv`wRb` I` tgv`b`j`b`	10
tU` t`j` wWb	4	Ggim`wG	3

Drm

GumW` ewó, A`µiq` i` vmiqbK` mvti` i` e` envi` t` gweKvi` A`µZv` ewx` t`c` t`q` gweKv``LY` NtU| Kul`g` eva` w` t`q` b`xi` bre` Zv` bó` Kiv` I` e`vcK` nvti` e` q` w`batbi` dtj` Livi` cØKvc` ewx` ciq` hv` gweKv``LY` NUvq` Aciv` Kvi` Z` Kul` . figi` e` envi` , w`beo` Ddkx` dmtj` i` Pti` i` dtj` w` b` w` b` gweKv``Re` c`v`_`Ktg` hvq`| Gfi`te` gmu` µgkt` e` envi` i` Abg`z`thv`Mx` ntq` cto`| Aem`AZ` w`k`i` eR` , tZRw`` t`g` c`v`_`I` Ab`vb`` qmZKi` e` tR` P` w`gk`Y` gweKv``LY` NUvq`| tZRw`` t`g` Zv` `g` gmu` t` t`_`tK` Drcw` Z` dmj` gv`b` t` i` Rb`` qmZKi` | G` Qvov` cwi` j` u`_`b` e`vM` e` envi` t` i` ci` Zv` th`Lv` t`b` tm`Lv` t`b` gmu` t`Z` tdtj` w` t`j` Zv` gweKv``LY` NUvq`| cwi` j` u`_`b` e`vM` Dv`w` t` i` w`k`K`toi` ewx` t`K` ti` va` Kti` Ges` tmP` I` w`b`Kv` t`k` gvi` v`K` Amj`æavi` mµó` Kti` |

gweKv`LY` ti`v`ta` Ki`Y`q`

gweKv` GKwU` AZ` `s`l` , i` z` cy` cØKwZK` m`µ`ú` | Gi` m`gze` envi` w`b`w`ØZ` Ki` tZ` ntj` gweKv` t`K` `LY` g`g` i`v`Lv` Avek`K`| gweKv``LY` g`g` i`v`L` tZ` w`Ksev` `LY` h`g` gweKv` t`K` e` envi` v`c`thv`Mx` Ki` tZ` w`bae`w`Y`Z` c` t` q` c` M`h`Y` Ki` tZ` nte` |



cvřvři gj`iqb

mivK Dřři i cvřk ivK ivřý (✓) iv b|

- 1| `řřYi Rb` řKřivU cřřivR` bq?
 - K) cřKivZK `evkó AUV`_vřK bv
 - L) řřřivZK I ivmřvubK cřiv eZř nq
 - M) `ř, eY, MÜ Acřiv evZř`_vřK
 - N) řh řKřiv&e`i Avřak` ev Abřřřek NřU

- 2) AvřabřřivM` ` IYřq Dcř`vřbi `evkó řKřivU?
 - K) cřKivZK řivře `řř cřbkrj
 - L) Rře-fřivmřvubK Přř cřřekřřivM`
 - M) cřKivZř PřřivKřři AveZřřřivM`
 - N) cřb řkřř ivlv³ řřgZř řj vř cvřq

- 3| evřý I řřYi Dcř`vř ivmřivře co Gi `vř řKřivU?
 - K) cřg
 - L) ivřřřq
 - M) Zřřřq
 - N) PZř[©]

- 4| G`řřivmř Rřvřřq `řřY Kř`_vřK?
 - K) M`řm I Křvř c`v`[©]
 - L) `řayKřvř c`v`[©]
 - M) `řayevřevř c`v`[©]
 - N) Křvř I Zřj c`v`[©]

- 5| evřřřř ivKřřiv Avřak` NÜřj ivř³i Avř řRb evY řřgZř nřm cvřq?
 - K) CO
 - L) CO₂
 - M) SO₂
 - N) H₂S

- 6| evřřřř řKřiv&Dcř`vř tevř`_vřKřř Gřřvř evřó nq?
 - K) Rj řq evř[©]úiv cřiv gvY
 - L) ajřv-evřj iv cřiv gvY
 - M) SO₂ M`řm
 - N) CO₂ I CO M`řm

- 7| `řřZ cřřbřřř `RřevK `ře`i Rřivřbi Rb` ivKřřiv Afřře NřU?
 - K) Lv` mřgMřři
 - L) Avř řRřřbi
 - M) Křevř WřB-A` vBřřiv
 - N) Ab`vř` M`řřřiv

Kv. I c j -x Dbq b -ž

- 8) Btj t±t#c-Us Kvi Lvbv t_#K wBMZ `t-Y cwb#Z Kx NUvq?
K) ZvcgvT v evovq
L) ZvcgvT v Kgvq
M) A±Zj I ¶vi Zj evovq
N) A±Zj I ¶vi Zj Kgvq
- 9) wbtPi tKvbiU tZRw®q `tYi mvt_ m±ú,³ bq?
K) wki gZzi nvi ewx cvl qv
L) cwb#Z ZvcgvT v ewx NUv
M) gv#Qi cRbb ¶lgZv nwm cvl qv
N) gwi Drcv`bkxj Zv tj vc cvl qv
- 10) th mKj Dv™c cwbi `tY gvT v Kgv#Z m¶lg tm ,tj v Kx Kx?
K) avb I cvU
L) KPzi cvU
M) KPzi cvb I tkI j v
N) niBwMj v
- 11) c_w exi evqgU#j BtZigta`B kZKi v KZfM CO₂ ewx NtU#Q?
K) 50 fM
L) 25 fM
M) 15 fM
N) 10 fM
- 12) Lv` Drcv`b w_ Y evov#Z wMfq mvi I KxUvk#Ki e`enri KZ_ Y ti #otQ?
K) `k_ Y
L) cvB_ Y
M) w_ Y
N) GK_ Y



DĚi g j v

1. M 2. L 3. L 4. N 5. K 6. M
7. L 8. M 9. M 10. M 11. L 12. K



Povšg j -vqb

BDibU-2

msuŋB I iPbugj-K ckae

- 1/ mvari Yfite cwi tek `HY ej tZ Kx eSvq e`vL`v Ki ly|
- 2/ BtKvmtotgi `wotKvY t_tK `yYi tkWweb`im Dc`rcb Ki ly|
- 3/ tZRw`G eR©Kx? Gt`i cfve I cZKvi wbtq Avtj vPbv Ki ly|
- 4/ cwbtZ Kx aiYi `HY NUtj nekj v½ mštbi Rb? nq? wki Kvi Lvbv t_tK wMŠ
`HYi cfve I cZKvi Dc`rcb Ki ly|
- 5/ ōgvbyB gvby i cwi tek `HYi Rb` gj-Z `vqit— e`vL`v Ki ly|
- 6/ eb wbatbi dtj Kxfite cwi tek `HY NtU eystq ej ly|
- 7/ RbmsL`v wētūvi b I cwi tek we` IYti vta mēte` mgvaib wbtq Avtj vPbv Ki ly|
- 8/ `HY ej tZ Kx eSvq nek` fite Avtj vPbv ej ly|
- 9/ `Re-wbab I `Re-AwbabthvM` `HY Kx? Gt`i cZwμqv e`vL`v Ki ly|
- 10/ GmW eμ Kx? GmW eμi cfite Kx ai tbi Amēav nq Zv Dtj -L Ki ly|
- 11/ evqy`HY RubZ Kvi tY DvM` th cZwμqv nq Zvi msuŋB weei Y w` b|
- 12/ wki -Kvi Lvbvi eR©Kx Ges Gme Kxfite cwbt `HY NUvq Zv Avtj vPbvq Ki ly|
- 13/ DDT Gi cfite DvM` I cYxi t`tn thme ŋwZKi cfve cwj wŋZ nq Zv mstŋtc
Avtj vPbv Ki ly|
- 14/ AwaK RbmsL`v RubZ migwRK `HYi wPī Ztj ai ly|



DĒi gvjv

Kwl. I cj-x Dbqpb -ğ

cW - 2.1

1. M 2. L 3. K 4. M 5. L

cW - 2.2

1. M 2. K 3. L 4. N 5. L 6. K 7. M

cW - 2.3

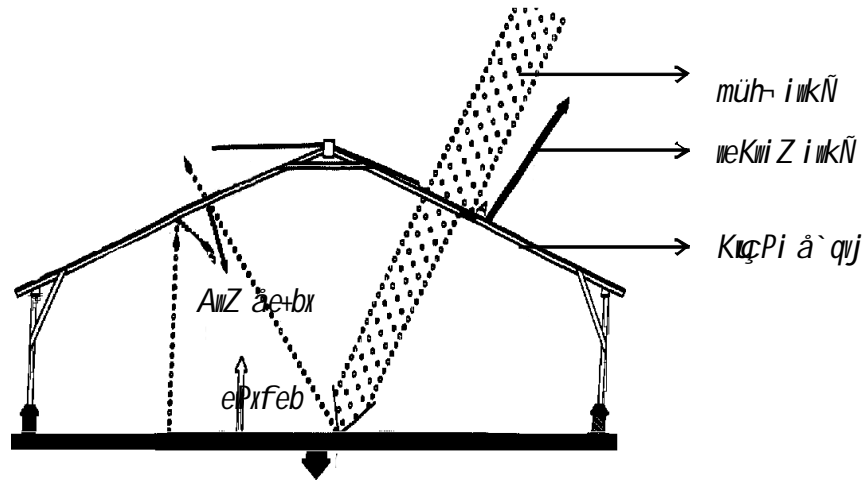
1. L 2. M 3. K 4. M 5. N 6. L

cW - 2.4

1. L 2. K 3. M 4. N 5. L 6. M 7. N

cW - 2.5

1. M 2. L 3. K 4. L



wP - 3.1-1: GKwU cKZ.Mib nuDRi gWj

GLvrb `k`gvb tmsi kw³ qjZi 1/2Kvfi (400-760 nm) KvP i t`qj w`tq Ly mnfRB tfZti cdek Kti Ges tmLvrb i wqZ Dw^m I Ab`vb` cwicwkKZvq Qwotq cto| cWZdj tbi ci GB tmsi kw³ i GKwU Ask KvP i t`qj tf` Kti evqgUtj weKwi Z nq Ges Avti KwU Ask, hv gj-Z A`k`gvb AwZ-j yj weKwi Y (Infrared radiation), KwP i t`qj evavM0` n`q KwP i Nti gta` t`tK hvq| dtj tfZti i ZvcgvIv evBti i ZvcgvIv Atc qv tek wKQYv ewx cvq| Avi GuvB n`q cKZ.Mib nuDR|

Mib nuDR cFve

Mib nuDR cFve K_wU evqgUtj i ZvcgvIvi mvt_ m`uKqj | cW_extZ mKj Zvc I kw³ i Drm mhP mh`f`_tK AwMZ Avtj vK iuk`wevfbaZi 1/2 `N`wb`q MvZ | Gi mKj Zi 1/2 `N`B `k`gvb bq| m`hP `k`gvb Avtj vK Zi 1/2 i `N`400-760 nm| Avevi Avtj vK iuk`fi meUKB R`tei KvR j vM br| AwZwi³ Ask f`c`p t`_tK Aetj vnz Zi 1/2 iuk`fi (Infrared radiation) wntmte, hvi Zi 1/2 `N`760 nm Gi D`ai`weKwiYi gra`tg evqgUtj i emnti Pj hvq| wK`S` evqgUtj Ggb wKQYm`im i`q`q`Q hv m`hP `k`gvb Avtj vK iuk`K cW_extZ Avm`Z tKvb evav t`q br| wK`S` Giv f`c`p t`_tK weKwiYKv`j Aetj vnz iuk`fi t`kvl Y Kivi q`gZv i v`L | dtj fe`p t`_tK weKwi Z Zv`ci meUKzgnv`k`b` Pj hvevi cwietZ`wKQYv Ask cW_extZ evqgUtj t`_tKB hvq| Gfivte KZUKZv`c cW_extZ evqgUtj t`_tK hvte Zv Aek` wbfP Kti Aetj vnz iuk`fi t`kvl Y q`gZv m`ub`eKx cwigvY M`im evqgUtj we`g`vb AvtQ Zvi l`cti | m`Z`iv`S` evqgUtj G ai`tbi M`v`mi Awak` hZ tenk nte Zvi Zvc t`kvl Y q`gZv l`ZZ evote | A`_P` G mKj M`im Mib nuDRi KwP i te`ob`xi g`Zv KvR Kti evqgUtj i Zvc ewx Kti | eZ`g`v`b` KveB WvB-A- vBWmn wKQYmKQYm`im evqgUtj ewx cvevi dtj cW_extZ D`o`Zv ewx cvt`Q etj weAvxiv c`h`vY t`c`q`q`Qb | dtj KwP i Nti c`h`vY g`Zv cW_extZ ZvcgvIv evovi Avk`v`v` t`_L v` t`q`q`Q | Avi GuU i bvgB n`q eZ`g`v`b` mg`q` euj Avtj wPZ 0Mib nuDR cFve`l` ev 0Mib nuDR B`td`±`0 |

eZ`g`v`b` KveB WvB-A- vBWmn wKQYmKQYm`im evqgUtj ewx cvevi dtj cW_extZ D`o`Zv ewx cvt`Q etj weAvxiv c`h`vY t`c`q`q`Qb | dtj KwP i Nti c`h`vY g`Zv cW_extZ ZvcgvIv evovi Avk`v`v` t`_L v` t`q`q`Q | Avi GuU i bvgB n`q eZ`g`v`b` mg`q` euj Avtj wPZ 0Mib nuDR cFve`l` ev 0Mib nuDR B`td`±`0 |

Mib nuDR Btd±i DrciE

kw³, i v`v`v`q`v`k` w`q`v`-w`q`v`v` I t`f`S` Ae`w` i GKwU RvUj m`g`v`K`i`Yi gra`tg DrciE n`q`q`Q cW_extZ Rj evqy` i`m` M`ni D`E`v`c` GZ Awak` th, tmLvrb GKRb gvby t`c`S`QvI Zvi kix`ti i`³ d`b`Z`Z` Av`i`K`ite | c`q`v`S`ti g`z`j` M`ni D`E`v`c` w`ng`v`t`i` GZB w`b`P` th, tmLvrb t`c`S`Qv` mvt_ mvt_ GKRb gvby c`P`U` v`U`v`q` RgvU teta g`Z`e`i`Y` Kite | G`_g`v`v` M`n` ZvcgvIv

wevfbzV nevi gj- KviY Mh`gtUvi evqexq Dcv`vfb weivU ivmivqubK wfbzV| cll_ex, g1/2 I iµ G wZbuU MhNB cPz tmSi kur³i Dcv`wZ i tqtQ| wKŠ weKtiYi gva`tg th cwi gvY Zvc kur³ gnvk#b` wdti hvq Zv wbfP Kti Mh`tjvi evqgUti M`vixq Dcv`vfb Dci | Mh` nuDfRi tfZti th cµµqvq KtiPi XvKbv w`tg Zvc Ave× n`q hvq, tmB GKB cµµqvq KveB WvB-A· vBW I wgt`tbi gZv wKQyKQyM`vm evqgUti wbarstki Zvc tkvY Kti DEvc ew× Kti | iµ Mh`ni we` » DEvtci KviY gjZ tmLvbKvi CO₂ mg× evqgUj, hv AwbqwsZ Mh` nuDR cµµqvq NUvq| Acic`t`q, g1/2 Mh`n CO₂ I Ab`vb` Mh` nuDR M`v`mi cwi gvY GZB Kg th, Zv wngv`i Dcti Zvcgv`v ati ivL`Z mg`bq| c`qvst`i, cll_exi i tqtQ bvBtU`Rb mg× evqgUj thLvfb CO₂ Gi cwi gvY kZKiv cµq 0.03 fvm, hv weMZ KtqK j`q ermti I tZgb ew× cvqub|

gvbe mō Kvhfejx w`tg cll_exi RiuJ fvi mg`Zv wevNz n`Z cvti Ggb aviYv cµg cKvk Ktib mBwK i mvqbwe` tmfvbZ Ai`nubqvm 1896 mvtj | Kajv, tZj, M`vm BZ`w` Rievk`

Ai`nubqvm gZ cKvk Ktib
th, `z` wki wec`tei Rb`
Awak Kajv tcvotbr n`j
CO₂ M`v`mi gv`v teto hvte
Ges Zv axi MuztZ
evqgUj`K DEB Kivi KviY
n`q wvte| ZLbKvi mg`q
GuU Ki-Kvnbx A_ev ZvE`K
welq wntmte wetePZ n`j I
cµq 60 eQi ci 1957 mvtj
K`vuj dnbqvi w`Em BbwiUDU
Ae I`mtbMh`dx tm mZ`Zvi
cµvY cub|

NuUZ Ryj wbi`nb tk`l CO₂ wMZ nq| Ai`nubqvm gZ cKvk Ktib th, `z` wki wec`tei Rb` Awak Kajv tcvotbr n`j CO₂ M`v`mi gv`v teto hvte Ges Zv axi MuztZ evqgUj`K DEB Kivi KviY n`q wvte| ZLbKvi mg`q GuU Ki-Kvnbx A_ev ZvE`K welq wntmte wetePZ n`j I cµq 60 eQi ci 1957 mvtj K`vuj dnbqvi w`Em BbwiUDU Ae I`mtbMh`dx tm mZ`Zvi cµvY cub| Zviv t`Lvb th, cll_extZ th cwi gvY CO₂ wMZ nq Zvi cµq A`aRB` vqxvite evqgUj Ave× n`q hvq| Gic`ti weAvbx tWvFU wKuj s 1958 mvtj nvl qvBtqi gbiy qvtZ evqgUj i CO₂ Gi NbZj 315 wcvGg wntmte ti KW`Ktib| wKŠ eZ`v`b Zv teto 350 wcvGg AwZµg Kti`tQ| tmfvbZ Ai`nubqvmB cµg Mh` nuDR Btd±0 K`vU e`envi Ktib| wki wec`tei h`M wecj cwi gvY Kajv tcvotbr dtj th cwi gvY CO₂ evZvfm wgtktQ Zvi Kzlj m`utK`v`Zub tmv`Pvi n`tqutj b| wZub fivel`vYx Ktib th, evqgUj CO₂ ew× tctq w`Y n`j cll_exi DòZv 5° tmjwqvm chSf` teto hvte| wZub Avil gZ cKvk Ktib th, CO₂ M`vm Ktg hvevi KviYB Z`vi h`Mi mµō nq| m`z`ivs G K_v ejvi B A`c`qv ivtL bv th, Mh` nuDR c`fveB GKmgq cll_extK evmthvM` KtiwQj | Zvc Acwivnx K`f mµōi KviYB cll_exi Mo Zvcgv`v eZ`v`b 15° tmE`Mw, Ab`_vq Zv -17.7° tmE`Mw i tewk n`Zv bv| m`z`ivs Mh` nuDR M`v`mi AeZ`v`b cll_ex ivZv wZ cwi YZ nte cµYnx kxZj Mh`n| ZvB cll_exi`v`fweK Z_v Ab`Kj- Aw`tZj Rb` GK w`tK thgb Gt`i cwi wZ Dcv`wZi cµqvRb i tqtQ, Ab`w`tK evqgUj Gt`i A`v`fweK Dcv`wZ thb wech`Ki Ae`vi mµō bv Kti Zv j`qYxq|



cuVwEi gj-raqb 3.1

mivK DEti i cvtk uUK uPy (✓) w b|

- 1/ Mib nvDtrI tFZti Kx aitbi MvO Rbvtbr nq?
 - K) gvV dmj
 - L) D`vb RvZxq dmj
 - M) me aitbi dmj
 - N) eRj RvZxq DvMc

- 2/ GKwU cKZ.Mib nvDR Kx w`tq `Zwi?
 - K) KvV w`tq
 - L) uUb w`tq
 - M) Lo w`tq
 - N) KtP w`tq

- 3/ KtPi t`qvtj evavMv`ntq tKvb&aitbi kw³ Zvckw³tZ cwi YZ nq?
 - K) tmSi kw³
 - L) `k`gvb tmSi kw³
 - M) A`k` AvZj vj nevKi Y
 - N) iAb iwkf

- 4/ Mib nvDR cvvte evqgUvj i Kx cwi eZB nq?
 - K) tKvb cwi eZB nq bv
 - L) DvZv evx cvq
 - M) ZvcgvTv nvm cvq
 - N) ktm`i Drcv`b Ktg hvq

- 5/ g1/2j Mvni ZvcgvTv tKgb?
 - K) cv_exi gtZv
 - L) cv_exi tPtq AtbK tewk
 - M) vngvt1/2i AtbK vbtP
 - N) iµ Mvni gtZv

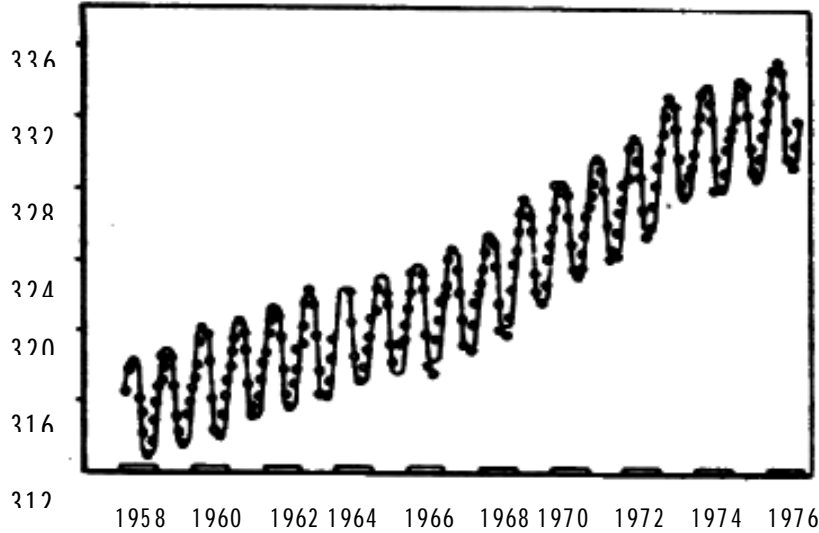
- 6/ g1/2j I iµ Mvni ZvcgvTv vfbzv i gjy Kvi Y tKvbu?
 - K) Avtj vK kw³ i vfbzv
 - L) gvEKvi aitb vfbzv
 - M) Rj xq Dcv`vbt vfbzv
 - N) M`vnxq Dcv`vbt i vfbzv

- 7/ Kx Kvi tY cv_ex tZ Zzv i hMi mvo ntvuQj?
 - K) CO₂ M`vm Kg_vKvq
 - L) CO₂ M`vm tewk_vKvq
 - M) O₂ Gi cwi gvY Ktg hvI qvq
 - N) O₂ Gi cwi gvY evx cvI qvq

cuW 3.2 Mib nvDR M`vmmgn- I Gt` i Dvm

ukí weí tei mvt_ mvt_ A_@
 ewaZ Rxevkf Rjy mb e`envi i
 ci t_#K Avenvl qmZ mgxKiY
 GK bZb gvTiv thm nq| Kvi Y
 ukí Kvi Lvbr th cwi gvY Rxevkf
 Rjy mb e`envi Kti ewaZ CO₂
 mbMZ Kti, Dv^mc I mMi ZZUv
 tkvly Kti mbZ e`_nq|

Kvi Lvbr th cwi gvY Rxevkf Rjy mb e`envi Kti ewaZ CO₂ mbMZ Kti, Dv^mc I mMi ZZUv
 tkvly Kti mbZ e`_nq| GQvor G kZtKi tMvovi w`K t_#K tgvUihrtbi Avne`rti i dtj
 e`vcK Rxevkf Rjy mbi e`envi cwi w`wZtK Avi I RvUj Kti Ztj | GQvorl i tqtQ Avak Rb-
 msL`vRmbZ KviY Lv`, Mfwbgyf mvgM⁰ I Rjy mb Pvn`v ci-tYi Rb` ubnePti e,¶| ubab|
 dtj cKwZ nvi vt`Q CO₂ AvExKiYi Dm|



AP- 3.2- 2: evqgUtj KveB WvB-A- vBW M'vtmi cwi gvY (uc. uc. Gg.)

1958 m#bi ci t_#K cu_xi CO₂ epxi cwi gvY Nubôfvte j ¶| Kiv nt`Q | tm mgq t_#K
 eZgub `kK chSÍCO₂ epxi nvi 0.5 fiv t_#K 1.0 Gi gta` mvgvex i tqtQ| KveB WvB-
 A- vBtWi Drmmgr eÜ ev ubMg#bi gvTiv KgvfZ br cvitj epxi eZgub nvi th Avi I
 DaYfvgx nte ZvZt tkvb&mt`n tbB| Avi Gi dtj evote Mib nvdR cÜZvLqv|

Kvi v metPtq teik CO₂ `LY NUvt`Q

mivari Y fvte Dbz t`kmgfKB evqgUtj CO₂ epxi Rb` `vqx Kiv nq| 1980 m#bi GK
 mgx¶vq t`Lv tM#Q Dbqbkxj t`kmgf t_#K thLvrb evqfZ CO₂ mbMg#bi cwi gvY uQj 13%
 tmLvrb DEi Avfgwi Kv, cüog BDti vc I `t-cP` t_#K mbMg#bi cwi gvY uQj 57% CO₂|
 uKŠ BtZvgta` Dbqbkxj t`kmgf#l kv³ e`envi i cwi gvY tefo hvl qvq avi Yv Kiv nt`Q
 AvMvgx kZvxi cÜ_gvstKB CO₂ mbMg#bi w`K w`tq Dbqbkxj t`kmgf Dbz t`k_ yj tKI
 Qvotq hvte|

vgf_b (CH₄)

GK AYyKveB I Pvi AYynvBtW#Rb mgstq MwZ GKwU M'vtmi bvg vgf_b (CH₄)| GuU
 cÜKwZK M'vtmi cävrb Dm Ges Gi `vn` ¶vgZv A#bK teik| vgf_b ubMg#b RbmsL`v epx I
 Kul KvthP mvt_ eüj vstK m=úK¶y | weMZ 200 erm#i evqgUtj vgf_tbi cwi gvY cÜq uQ_ Y
 ntqtQ| cÜKwZK Dm Qvorl Rj vfvq, cPbkxj eR⁰, Mew` ci, DBtcrKvi A#šfemeimKvi x
 e`vKtUvi qv BZ`w` Dm t_#KI vgf_b M'vm mbMZ nq|

Rj vev avtbi RvgfZ `Re c`v`e`vKtUvi qv Øviv weRwvZ ntq vgf_b M'vm DrcbæKti |
 eZgub ve#k#i tgvU vgf_b Drcv`#bi kZKiv 10 fivMB Rj vev avtbi Rvg t_#K AvmtQ|
 vekf-Lv` I Kul.ms`vi (FAO, 1994) gtZ avtbi Rvg t_#K erm#i 60 vgvj qb Ub vgf_b
 Drcbæng Ges Gi kZKiv 90 fivMB Avtm GvKq t`k_ yj t_#K| bqv-w`j` BvUqv



cuVwEi gj-raqb 3.2

mWVK DEti i cuTk WUK WPy (✓) w`b|

- 1/ Mib nVDR cAZWuqv NUvZ CO₂ Gi Ae`vb kZKiv KZ?
K) 50 fVM
L) .03 fVM
M) 18 fVM
N) 14 fVM

- 2/ GKRB gvby cAZw`b wtkj`mi mif_ Kx cwi gvY CO₂ Z`VM Kti?
K) 10 cvDU
L) 8-10 cvDU
M) 5-7 cvDU
N) cUq 2 cvDU

- 3/ cAZ eQi eb-DRWOKIY cUqv gva`tg th cwi gvY CO₂ evqjZ msthvRZ nq Zv cUq KZ wuj qb Ub?
K) 2860 wuj qb Ub
L) 1660 wuj qb Ub
M) 3000 wuj qb Ub
N) 1000 wuj qb Ub

- 4/ evqjZ CO₂ evori gj- Kvi Y tKvWU?
K) eb wbab
L) RbmsL`v eWx
M) Rievk`Ryj wbi e`envi
N) bMi vqb

- 5/ cUkWZK M`v`mi cAvb Dm tKvWU?
K) CO₂
L) CH₄
M) N₂O
N) CFC_s

- 6/ Rj ve`x av`bi Ruq t`K Drcbwgt`b M`v`mi wmsnfvMB Avtm tKv&Gj vKv t`K?
K) Dbz t`k, wj t`K
L) AbtWZ t`k, wj t`K
M) Gwkqvi t`k, wj t`K
N) DEi Avtgui Kvi t`k, wj t`K

7/ eZ@tb evqjZ N₂O evxi nvi kZKiv KZ?

- K) 0.3 fivM
- L) 3.0 fivM
- M) 30 fivM
- N) 0.1 fivM

8/ CFC_s Mivtmi cavb Dm tKivU?

- K) evqjUj
- L) c@KivZK Liv
- M) Dv`c RivZ
- N) gibe m@

cW 3.3 Rje RMZ I M@b nivDR Btd±

j 7 gubj4K Abvni I gZai w`k tvtj w`z cvti | dtj A_9wZK I mvgwRK wech9 NUte hv tKej gvI AvYueK h5xi fqvzvvi mvt_ Zjbrq etj weAvbxi v gtb Ktib|

epocvZ cfve

Avenl qvi cwieZB tnZewocvZi ai#bl weivU cwieZB Avmte etj weAvbxi v gtb Ktib| dtj Dai9A7vstk cPz epocvZ, M9gUj xq AA#tj Nb Nb epocvZ Ges ga" A7vstk M99Kvj xb epocvZ Ktg hvl qvi m#vebr i tq#Q| Gi A_9nt"Q bWZkxZv9 AA#tj kxZKvtj nte Av"Ges M99Kvj nte i"9| c7vst#i Dc-M99Kvj xq AA#j (Sub-tropic) hv B#Zvgt#B i"9 Zv Avil i"9 ntq hvte| M9b nvdR cfr#ei dtj h9iv9" epocvZi cwigYv AvMgx 50 erm#i i gta" kZKiv 40 f#M nvm cvte etj weAvb#`i avi Yv| weAvbxi v Avil gtb Ktib th AvndKvi vbi 7lxq AA#tj i epocvZ te9bx (Rain belt) DEi w`k m#i wMtg mvt#j GjvKv Av`Zvh9 Kite Ges ga" P#t#i c9stq Kul. fvg#Z cPz epocvZ NUte| wKs' evsj v`k I fvi#Zi epEi Ask nte Liv Kenj Z|

Kul#Z M9b nvdR c9Ziqv

Kul#Z chv9MZ wec9 N#U _vKtj I vek' Lv" Drcv`b AvRI Avenl qv I Rjevq#Z Dcv`v#i Dci GKvstf#te wbf9Kvj | ZvB Rjevq#Z th tKvb# cwieZ#b Kul. Z_v km" Drcv`b, ci cvj b, eb I grm" P#t#i Dci cZ"7f#te th cfve cote Zv#Z tKvb#m#`n tbB| wKs' vek' Lv" I Kul. ms`vi (FAO) g#Z evq9U#tj i Zvc ep# tctj AvR thLv#b Zxek#Z tmme `v#b km" Drcv`b m#e nte| AvMgx 100 erm#i ga" A7vstki Rjevq#`li (Climatic zone) Ges Gi mvt_ m#u"3 B#Kvmt#`g 200 t_#K 700 wKvg ch#l tgi y w`k `v#vst#i Z nte| G#Z i wKqv, h9iv9" I Kv#vWvi g#Zv bWZkxZv9 AA#tj i t`kmg# DcKZ. nte| wKs' i"9 I Dci"9 AA#tj i (Arid and semi arid zone) t`kmg# 7lvZM9l nte| mrviv gi fvg hv 200 wK. vg. `77Y w`k m#i hvq Zte tmLvbKvi m#u" kZKiv 30 Rb tj v#Ki Lv" ms`vb w`z Amg_9#te|

vek' Lv" I Kul. ms`vi (FAO) g#Z evq9U#tj i Zvc ep# tctj AvR thLv#b Zxek#Z tmme `v#b km" Drcv`b m#e nte|

Dv#`i Lv" I Ab`vb DcKiY h_v"9eRvq _vKtj evq9U#tj Kve9 W#B-A. vBW ep# RibZ Kv#Y dmtj i Drcv`b 10 t_#K 80 f#M ch#l ep# cvl qvi m#vebr i tq#Q|

Kul. Drcv`b `9U DrKEvRbK DciE nt"Q D#ZP Zvcgv#v I `v#vq epocvZ ev tm#Pi NvU#Z| M9b nvdR cfr#ei Kv#Y m9 D"P Zvcgv#v f#v I mqm#t#i g#Zv wKQymKQyDv#`c P#t#i we`#Z NUvtj I cv_#xi GKw_ i#zc`9dmj av#i c9v#vq#t#i Dci tbWZevPK cfve tdj#te| Dv#`i Lv" I Ab`vb DcKiY h_v"9eRvq _vKtj evq9U#tj Kve9 W#B-A. vBW ep# RibZ Kv#Y dmtj i Drcv`b 10 t_#K 80 f#M ch#l ep# cvl qvi m#vebr i tq#Q| Kve9 W#B-A. vB#Wi DeP#Zv m#v 7lgZv (Fertilizing effect) m#`nvZ#Z f#te chv#vZ| dtj Db#Z we#k' M9b nvdR dmj Drcv`b CO2 tK mvi w#tm#te e`envi Kiv nq| GUV avi Yv Kiv nq th eZ9vb mg#q dmtj i eva#Z Drcv`b i wQ#b Avs#kKf#te ntj I evq9U#tj eva#Z Kve9 W#B-A. vB#Wi GKw_ B#ZevPK fvgKv i tq#Q|

Kve9 W#B A. vB#Wi B#ZevPK w`K

cKw#Z#Z Dv#`i Kve9 wecv#Ki Rb" C3 I C4 RvZvq `9U wfb#Zi c#v#Z i tq#Q| eva#Z Kve9 W#B-A. vB#Wi c#Z m#vov c9v#b C3 Dv#`c C4 Dv#`c A#t#7v tenk KihRix| G#Z K#i Z#v#vqj-Kf#te bWZkxZv9 AA#tj i dmj thgt Mg, ev#j "BZ"v# Av#K m#v#v t#v#M Kite| c7vst#i, AvL, avb cfr#Z M99gUj xq dmj Kg m#v#v cvte| evq9U#tj Kve9 W#B-A. vB#Wi Av#iKw_ B#ZevPK w`K nt"Q mKj dmtj i Rb" Db#Z#i cmb e`envi 7lgZv (Water use efficiency) ep# Kiv| Gi dtj Kg cmb e`envi 9viv i"9 I Dc-i"9 AA#tj (Arid & semi arid regions) dmj Drcv`b Kiv m#e nte|

mM#i i D"PZv ep# RibZ c9Ziqv

Kul. cv#i wP#Z I cv#te k

weAvb#`i avi Yv AvMgx 50 t_#K 100 erm#i i gta" cv_#xi evq9U#tj i Zvcgv#v 2-5" tmt ep# tctj tgi AA#tj i Av#Kisk eid M#j wMtg mM#i i cmb#Z thw# nte| ZvQvov DEvc ep# RibZ Kv#Y mM#i i cmbi AvqZbl ep# cvte| dtj 2100 mvtj i gta" mg#j i cmbi D"PZv 0.3 t_#K 1 wglvi ch#l ep# cvte etj wevfbem# t_#K AvksKv Kivnt"Q|

cil_xi tgu Rj i mki kZKiv 97.5 fiv mimi Ges gnvmMti, b fiv DZP ceZ-k/2 I tgiy AAjt Ges eitd Avex| emk 0.5 fvtMi gta itqtQ b`-b`x, Lvj -nej, n, tWvev-bijv, SiYv I fMf` cmbi Avavi | weAvbxt` i aviYv AvMiqx 50 t_tK 100 ermii gta cil_xi evqgUjt i ZvcgrIv 2-5°mt ewx tctj tgiyAAjt i Avakisk eid Mtj wMtq mimi cmbtZ thvM nte| ZvOvov DEvc ewxRwbZ Kvity mimi cmbi AvqZbl ewx cite| dtj 2100 mtj i gta mgty i cmbi D`PZv 0.3 t_tK 1 wglvi chS ewx cite etj weifbemt t_tK AvksKv Kiv nt`Q | Zte gij Ox, Bt`vfbwqv, wftqZvbg, evqf, Pixmn cil_xi eu wbaAj Ges evsj vt`tki cOq GK ZZxqsk GjvKvj eYv` cmbi wotP Wte hvte| nwi tq hvte Pvl thvM DeP Riq| Mpnxb nte j j j Rbc` | web nte DcKj xq grm` Pvl I gvbMf ebiAj | Rjt v`Qptmi AvLZvq Avmte DcKj xq wbaWg| e-Ox AAjt i `r`ycmbi Avavi , t j v j eYv` cmbtZ fti hvte| GfiteB evck cwi eZB Avmte `Re-Btkvmt ÷ tg|

grm` Pvl cive

Avenvl qvMZ cwieZfb i dtj grm` mzt` i Dci A`vmeK Pvc mjo nte, Zv tm mimi ev wglv cwb thLvfbB thvK| gvtQi mvgv`K Avev`j I cusUthi `vbsli NUte, e`nZ nte Drcv`bkxj Zv| `r`ycmbi gvQ Liv, eb`v I D`P Zic Oviv `viYfvte qvZM` nte| GKBfvte qvZM` nte wpsox Pvl | dtj grm` Pvl I AvniYi mt` mzu` j j j gvbj i Rieb hvlvq coze Pi g Uvbr tcvov|

ebm`ut` cive

cil_xi KveB Pm weeZfb e`j i mri fvgKv LyB , i ZcY` cOq 2000 weij qb KveB cil_xi meR MvOcvj v I gvu aviY Kti AvtQ, hv evqgUjt Aev`Z tgu KveBbi cOq wzb , Y| e`j wbab ev AcvriYi dtj aviYKZ.KveB Rjv wv wmvte e`euZ ntq A`ev cOwZK Dcvq Rvii Z ntq cYivq evqgUjt wdti Avtm| GK mqv`lvq t`Lv tMtQ 1950 t_tK 1989 mtj i gta` eb wbatbi dtj 90-180 weij qb Ub KveB evqgUjt Rgv ntqtQ hv Kaj v I Rjv wv t_tK RgvKZ.KveBbi cOq mgcwi gvY|

eaBkxj MvOcvj v mtj vK-mstK-IY cOqv i gva`tg evqgUjt i KveB WvB-A` vBW tkvtl tbq Ges AvExKiY Kti ivtL| Avak nti e`j wbatbi A`nte GKw`tk KveB AvExKiY cOqv wevZ nlqv, Ab` w`tk KwZ e`j i mri RviY cOqv t_tK evqgUjt Avil KveB Rgv nlqv| dtj Mib nvdR cOkv Avil ewx cite|

Mib nvdR civeRwbZ DEvc ewxtZ e`j i mri I Ab`v` Dv`ti` i Dci weifc cOZvqv mjo nte| Avakisk e`jB `f cwi mi ZvcgrIv gta` (Narrow range of temperature) AvfthvRZ| evqgUjt i ZvcgrIv KtqK wvMtm: ewx tctj Zv nte ebfvgi Rb` wechqKi | Kvity GtZ eZgib Rj evqyAAj , t j v kZ kZ wK. w. tgiyAAjt i w`tk mti hvte| wKs` ebiAj mti hvevi Rb` th mgtyi cOqv Rb Rj evqycwi eZfb i eZgib nvi Zvi tPtqI Avak| ZvB mgqgZ ebiAj Avfemb cOqv tRvi`vi Kiv bv ntj ebiAj i Rie `evP` gvi wKfvte qvZM` nte|



Abkxj b (Activity) t Mib nvdR cOZvqv dtj GKisk kZvaxZ evsj vt`tki Kul. I cwi tetk thme cOZvqv t`Lv w`tz cvti Zv Djt L Ki ab (Abg`200 ka)|

Mib nIDR cfi ve ibqstY KiYiq

0gube mfZv A`veva
hZ,tjv mgmiv tgvKitejv
Kti tQ Rj evqycwi eZBRibZ
mgmiv ntv Gi wfi Zi
metPtq gvi vZK0

Mib nIDR cfi ve gube mo GKUW nekje`wic mgmiv| 0gube mfZv A`veva hZ,tjv mgmiv tgvKitejv Kti tQ Rj evqycwi eZBRibZ mgmiv ntv Gi wfi Zi metPtq gvi vZK0- (Avj tMvi, Dci v0cWZ, gwK0 hY i v0, GwCj 1994)| mZi vs AvAvj Kfi te Gi tKvb&mgvavb mpe bq| cwi tek veAvibx`i gtZ eZ0vb`IY nvi GLtbv ibqstYi evBti Ptj hvqvb| mZi vs hZ`Z mpe nekje`wic th c`tq|c,tjv tbqv DiiPZ Zv ntv vt

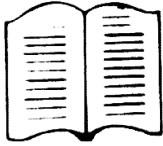
- RievKf Rjv vnb h_vmpe ibagvIvq ivLtz nte Ges weKf e`e`v intmte ibi vc` Rjv vnb i Drm L0tz nte|
- clyte`envi thvM` kw3 hv mvaivYfite cwi tek`IY NUvq bv thgbt evqy cwb, tmSi kw3, cvi gvbieK kw3 BZ`wv e`envi ti i c0Z tenk bRi w`tz nte|
- `f tZj e`envi Dc thvMx gUi hvb D`m`eb Kti Rjv vnb e`envi KgvTZ nte|
- c0KwZK eb mpu` msi qjY I bZb Kti ebvqzbi e`e`v vnb tz nte|
- Kul tz ivmivqvbK mti i e`envi Kvgtq`Re mti i e`envi evovTZ nte|
- m`f weKf Avw`v ti i gva`tg CFCs e`envi KgvTZ nte ev c0qvRtb eU Kti w`tz nte|
- gUi hvb I wki Kvi Lvbr t`tk vbmZ aqv t`tk Mib nIDR M`im Acvvi tYi chv3 D`m`eb Ki tz nte|
- wki Kvi Lvbr,tjv vbi vc` ivLvi chv3 D`m`eb Ki tz nte|
- avtbi Riv t`tk Af vgt_b vbmZ nq Ggb me avtbi Riv D`m`eb Ki tz nte|
- Mib nIDR cfi ve`ixKi tY Dbz nek`K AMvY fvgKv cvj b Ki tz nte Ges Dbqbkj t`k,tjv vK c0qvRbxq Kwvi Mix I Avw`R mvi vZv c0vb Ki tz nte|
- MY-gva`g I Ab`vb` gva`tgi gva`tg Mib nIDR cfi vtei Kzj mpu`K`RbmtPZbZv Mto Z`tz nte|
- `vbxq I AvSR0ZK chvq mgvSZ cwi Kf bv M0Y I Zv ev`evqzbi e`vcK c0WZ vnb tz nte|
- th`nZz RbmsL`v evx`RvbZ Kvi tYI cwi te`ki`IY nt`Q tm Kvi tY RbmsL`v vetCvri Yti vta KvhRix e`e`v M0Y Ki tz nte|

cvfVei gj`iqb 3.3

mivK DEti i cvfk wUK wPy (v) w`b|



- ◆ I tRvb`li qti cZKwZ I KviY m`utK`Avtj vPbv Ki tZ cvi teb|
- ◆ Rxe RMtZ I tRvb`li qti djvdj e`vL`v Ki tZ cvi teb|
- ◆ I tRvb`li q q cZt vta Ki Yxq c`smgy Ztj ai tZ cvi teb|



Av tRtbi wZb cigvYvbtq MvZ GKwU ifctf`i biv I tRvb (O₃)| meAvtbi fvlvq hv Atj wck gwMcdtKkb bvtg cwi wPZ| mthP qZ` Zi 1/2 ` tNq AvZ te_u w iwkf (Ultraviolet ray) Av tRb AYtK tftz tdjvi qZv ivtL| mvariYfvte mthP 240 nm Gi tPtq qZ` Zi 1/2 mekó AvZ te_u w iwkf cfvte Av tRb AYj mtj vK-vehw² (Photo disassociation) NtU| Gfvte temotq Avmv gY Av tRb cigvY Av tRb AYj mtj_ wgvj Z ntq I tRvb (O₃) `Zwi Kti|

evqgUj I tRtbi e`wB

cw_exi evqgUj KZ_wj cAvb`li wbtq MvZ| G_tjv nt`Qt UtcwUqvii, UtcvR, ÷ tUwUqvii, AvqvbtwUqvii BZ`w | evqgUj i me tPtq wbtPi`li wU me`wZ f_ cP t_ tK cUq 11 wK.wg. chS Ges GuU bivB UtcwUqvii | tgN, evqgUvN, So cfwZ G`ti B mNwZ nq| UtcwUqvii DaYwgvK UtcvR etj | mvariYfvte UtcvRi Dcti ajv-ewj I Rjxq ev`u`_ tK bv| G`ti Mfvi Zv LpB Kg| Gi Dcti itq tQ ÷ tUwUqvii, hvi me`wZ f_ cP t_ tK cUq 50-60 wK. wg. chS| GB ÷ tUwUqvii gta`B f_ cP t_ tK 30 wK.wg. Dta`m wbtwK AvtQ I tRvb Mv`mi GKwU cvZjv`li hv I tRvbwUqvii bvtg| cwi wPZ| cw_exi evqgUj i cUq meP B Kg teW I tRvb cvl qv hvq| Zte f_ cP t_ tK 25 wK.wg. Dta`Gi NbZj mekA 15 wC.wC.Gg. |

cw_exi evqgUj i cUq meP B Kg teW I tRvb cvl qv hvq| Zte f_ cP t_ tK 25 wK.wg. Dta` Gi NbZj mekA 15 wC.wC.Gg. |

I tRvb`-i qti cZKwZ.

gj-Z gvbtj i wqv KtgP dtjB eZgvb I tRvb`li qtcwB nt`Q etj cKv| evqgUj I tRvb`li q cUg aiv cto 1983 mtj hLb ewk G`vUvKwUk mrtf`vbtg GK`j ewk MtetK G`vUvKwUk evqgUj I tRvb`li GKwU weivU MnYi t`L tZ cvb| ZLb G MtZP cwi gvc wQj 40 kZvsk| 1987 mvj chS Zv teto`wvq 60 kZvstK|`tbi cwi gvtc GuU cUq hY ivtof mgcwi gvY etj meAvbxiv avi Yv Kti b| 1978 mtj cwi Pwv Z cUv Gwi bvm Avfhtbi (wPvj i`w qAvj xq GKwU kni cUv Gwi bvm) Z` t`KI Kzgiy AvKvK I tRvb`li MnYi m`nvZ fvte cUwYZ nq| GB Avfhtb AvI cUv cvl qv hvq th, mvqMk fvte MZ 18 eQtI I tRvb`li 2-3 kZvsk wejxb ntq tMtQ|`yayKzgiyAAtj i AvKvKB bq cw_exi eU Rbeuj AAtj i AvKvK I tRvb`li I Rb KgtZ`iyKti tQ| Zte Zvi gvUv KzgiyAAtj hZ bvUkxq fvte NtUtQ tZgbU bq|

tKvb tKvb meAvbxi gtZ Kzgiy AvKvK mP I tRvb`li MnYi m`uY`I tRvb NvUwZ RvZ KviY bq| eis A`bKv evqy`i web`vm RvZ`wI KviY ntq`vK tZ cvt| w`vm Avenl qv Dcmh t`K j q Kiv tMtQ eQtI i tKvb mgtq Kzgiy I tRvb`li nvj Kv ntq hvq Avevi Ab` mgq Zv`v fmeK Ae`vq wdti Avtm| Awkusk I tRvb`Zwi nq M`gUj xq AAtj i evqZ| M`\$ gUj t`K tgiyAAtj evqy`vtni`v fmeK MvZ ct_ A`bK mgq cZvUkZvi mP nq| dtj Kzgiy I tRvb`v fmetKi tPtq A`bK Kg tcStQ| AvI tm KviYB tgiyAAtj evqZ I tRvb NvUwZ ntq`vK tZ cvt etj A`bK gtb Kti b|

I tRvb`li m`utK`Awk Z` AvnitYi Dti tK` 1989 mtb hYivo, iwkv, etUb, dvY, Rvgw I Rvctbi meAvbxiv GK thS_ Avfhtb cwi Pj bv Kti b DEi tgiyZ| Zv`i Zt` Rvb hvq RgvU bvUk GwmtWi tgN DEi tgiy I tRvb`li tLq nvj Kv Kti tdj tQ|

I þRvb -i ¶tqi KviY

CFC_s cg emYiR`K e`envi
iiy nq 1960 mtj
wiidRvitiUtii kxZjxKiþYi
KvþR| cti Aek` G aiþbi
M`im GqviKþvi, t`u`K`vb,
c-mK tdtvgi Dcr`vb,
gvBþmBþj KuUK mmiK cwi`vi
Kivi `þY BZ`w` emea KvþR
e`eZ ntq AvmþQ|

mh`¶tK AvMZ AwZ te, ub iukþi gviþK ¶wZKi cve t`þK cu_exi RxeKþþK i ¶v Kivi
Rb` th I þRvb -li QvKbxi gþZv e`eZ nq Zv AvR gvþþi i wµqv KþgP dtj B nvj Kv ev asm
cB ntZ hv`Q| we`Avbþ`i gþZ I þRvb -li ¶q mvaþb gy` fvgKv ivLQ gibe m tKvþiv-
tdvþiv Kve (CFC_s) bvgK wkiRvZ M`im, hvi tKvb cKwZK Dm tbB| 1928 mtj
hþivti tRvþij gUm`Kv`vþvxi we`AvbMY CFC_s M`im D`m`eb Kþib| Zte CFC_s cg
emYiR`K e`envi iiynq 1960 mtj wiidRvitiUtii kxZjxKiþYi KvþR| cti Aek` G
aiþbi M`im GqviKþvi, t`u`K`vb, c-mK tdtvgi Dcr`vb, gvBþmBþj KuUK mmiK cwi`vi
Kivi `þY BZ`w` emea KvþR e`eZ ntq AvmþQ| GB M`im weI wenxb, ubw`, mnþR Ab`
tKvb&c`v`_P mtj_ weµqv NUvq bv Ges ubPZzicgvvq ev`rfZ nq| AwaKvsk CFC_s evbþbv
mnR Ges `vþgI m`-i|

I þRvb asmKvix CFC_s Drcv`b 1960 mtji ci t`þK kZKiv 30 fvM nvti evotQ|
e`enviti Dm t`þK CFC_s M`im evqgj cek Kij Zv `xN`w` b A¶Z Ae`vq _vþK|
evqgj Uþcmqv t`þK CFC_s cwiPvj b cxwZþZ cwvZ ntq oþUwqv tS
cZwµqv kþyKiþZ mgq jvþM AZt GKhm| wks` tmLvb tSqv tmLvbKvi cj
mgvvþ evqgvni ms`tk`Gtm ` we`Z jvf Kþi Ges AwZ te, ub iukþi weµqv
KviþY Lþ `f mgþi gþa` -þK cwiYZ nq| mþP AwZte, bx iukþi cvte CFC_s tft½ gþ
tKwib cigvYy(CI) teo ntq Avþm| wehþ tKwib cigvYyZb cigvYyemk I þRvb (O₃)
tft½ DrcbKþi tKwib gþv. vBW I Aw þRb| cigvYyZB tKwib gþv. vBW Avevi gþ
Aw þRb cigvYy mtj_ hþ ntq Aw þRb M`im I gþ tKwib cigvYyDrcbKþi| Gfite
Gkuw tKwib cigvYygvMZ tPbB weµqv gra`tg 1,00000 AyyAw þRbþK tft½ tdj þZ
m¶g| dtj ` ¶q nt`Q I þRvb -li |

meþKl Zt` Rvbr tmtQ I þRvb -li ¶tqi wb iayth CFC_s `vqx Zv bq| tKwibhþ Ab`vb`
M`im thgbt Kve tUwþKv vBW, wgvBj tKvþivdig BZ`w` I I þRvb -li ¶q mvab KiþQ|
km` t¶t e`eZ bvBþUþRbNwZ mvi t`þK wefbaKwZK cvqv Ges tmsi kw`i cvte
bvBþm A- vBW Drcbnq| GB M`im oþUwqv tSj mþP AwZte, bx iukþi cvte
tft½ Uv Uv ntq bvBþUþRþi tiwK`vþj cwiYZ nq| bvBþUþRþi GB tiwK`vþj
I þRvbþK AvµgY Kþi Ges asm Kþi | gþ tKwib cigvYy tþq bvBþUþRb tiwK`vþj i
I þRvb weasm ¶gZv 6 , Y Kg| Zte evqgj bvBþm A- vBþwi cwi gvY eQti 0.25 fvM
nvti evotQ Ges Gi Kg¶gZv meZ 150 eQi ch eRvq _vþK| gibe m KviþYi
cvcmk tmsi-Kjþi KviþYI `vmetKi tþq AþK tenk cwigvY I þRvb asmKvix
bvBþUþRb tiwK`vþj m nq etj avi Yv Kiv nq|

Rxe RmþZ I þRvb -þi cve

÷þUwqvþi Zvc Kvþgv msi ¶tY I þRvb -þi fvgKv Acwi mg|mh` ntZ AvMZ
AwZte, bx iukþi (Ultraviolet ray) kZKiv 99 fvMB I þRvb -li tkvY Kþi ivþL| emK gv 1
fvM Gtm tS aivc| G iukþi gvþþi tþvL aiv co bv| A_P Zv gvþv I Dm`mn mKj
cvKþj i Rb`B Pig ¶wZKi | I þRvb -li mþP GB ¶wZKi AwZte, ub iukþi QvKbxi gþZv
iþl ubþq cwi`Obmþþ Avþj v cu_exþK Dcrvi v`þQ| AwZ te, ub iukþi iþl tbqv KviþY G
-þi Zvcgvv AZ` tenk(cq 170° dvt)| Avi Gi weþgtqB aiv-c i ¶v cv`Q AwZ
Dvci Kej t`þK| I þRvb vþgi M`vþmi G ejq wvþgi tLmvi gþZv j ¶ tKwv eQi at
i ¶v Kþi AvmþQ cu_exi RxeKþþK|

I tRvb`fi i qjq ev Gi NbZ; nij Kv nI qv RvbZ Kvi tY ÷ tUmcuqvi I fctoi gta` Zvtci
fvmvg` webó nte| mthp AwZ te, ub iukf tkvly Kti otUmcuqvi GLb th ZvcgvIv aviY
Kti AvtQ I tRvb`fi i Afvte Zv mivmvi Utcwucqvi ev f,ctó Gtm tmLvbKvi Zvtci gvIv
emotq Zjtē|

I tRvb`fi webó ntj mthp tK AwMZ gnvRvMvZK AwZ te, ub iukf mivmvi cu_extZ Gtm cOYx
I Dv`c Ktj i Rb` gvi vZK cOZuqv mpo Kite| GtZ cOYx`tn K`vYvti i gtZv`jvtiM`
e`mai mpo nte| AwZ te, ub iukf cfvte gvbjl i Mvtqi Pvgovi cxZvf is aviY, Pvgovq fvr
cov, tPrL Qmb covm bvbv aitbi RvUj tivtMi mpo nte| evote nmcM I tncvUvBilum
tivtMi cfvte| ZvQvov Gi cfvte gvby I Ab`vb` cOYxi tivM cOZti va qJgZvI tjvc cvte
euj vstk|

AwZ te, ub iukf ms`utkGtj gvbjl i Pvgovq`avgvM I gvjvbgv bvtg`aitbi K`vYvi
mpo nq| Avtgvv Kvi cwi tek msi qJY GtRvYi (EPA) Z`vbyvUbx`i gtZ 1% I tRvb`fi i
qjq ZtK 5% tenk`avgvM K`vYvi Ges 2% AwK gvjvbgv K`vYvi mpo Kite| gvjvbgv
K`vYvi GKvU RvUj tivM, hv t`tK AvtviM` jvf Kiv cOq Am`e| Zt` Avil cKvk
K`vYvi i tPq tkZvIvB Gi Oviv tenk Avvsv`nte| Rbeuj GjvKvq I tRvb`fi qjq-cOj
ntj Zvi cwiYvZ nte Avil fqvi| I tRvb`fi qjq Avt Kiv qJvZKi v`K AvtQ| Zv ntPQ
I tRvb`fi Utcwucqvti i Dcti GKvU QvZvi gtZv t`tK cu_extK AwZ te, ub nvZ t`tK i qJv
Kiv tQ| tKvb Kvi tY GvU nij Kv ev tKv_vl tKvb vO`ntj mthp AwZ te, ub iukf f,ctó tcStQ
evqgUjtj i v`e`fi i mg`I Av` tRbtK I tRvb` M`vfm cwiYZ KivZ cvti| GtZ Kti velv³
I tRvb` M`vfm AvatK` RxeRMZ gvi vZK wechqvi m`v`vb nte|

Kuliz cfiē

I tRvb` i qjqRvbZ Kvi tY cu_exi Rj evqyl Kul i Dci l weifc cOZuqv cote| AZtZ
I tRvb`K Dv`c evxi mnvqK vbgvK vnmvte vetePbv Kiv ntZv| vKs` eZv`vb m`nvZvZ
fvte cOYvZ th GvU Avmtj cwi tek I Dv`c`i Rb` gvi vK qJvZKi| I tRvb`fi qjqRvbZ
Kvi tY AwZ te, ub iukf cfvte Dv`c` tKvI vKZ.vl qv, avb, tmvqmeb, etavKvuc, t`vqvk
BZ`v` eü dmtj i mvtjvKms`k`Y gvIv nvm cvevi dtj Drcv`b e`v`vZ nte| chfB cwb
cvl qv mtZj j Zv, j v`I Pvi v MtQ cOYi D`tQj Zv_vKte bv| gvQoi Drcv`b, gvQoi cRbbmn
mKj aitbi mvgv`K cOYxl G Oviv qJvZM`I nte|



Ablyj b (Activity) t I tRvb`fi qjq tKSkj e`v`vceR Kul. I cwi tek Gi cfiē eYv
Kiv|

I tRvb`fi qjq tivta KivYq

we`kji Dbz` t`kmg`tn I tRvb` avsmKvix cavb M`vm CFC_s Drcv`b Z ntj I Gi e`vcK e`envi
meP| ZvB I tRvb`fi i qjqtivta Dbz` vektKB GvMtg AvmtZ nte| thtnZvCFC_s v`v`Kv
evqgUjtj AqJZ Ae`vq Ae`vb Kti I tRvb`fi tK avsm Kti, tmtnZvGLbB Gi Drcv`b eÜ
Kiv DvPZ| vKs`evvYvR`K Kvi tYB G gvjZ`Zv m`e bq| ZvB evqgUjtj hZ Kg CFC_s vBMZ
nq tm v`tK mKj tKB mRvM`vKtZ nte| vclR, Gqvi K`jvi, BZ`v` hšcvmZ (thLvtb CFC_s
e`eüZ nq) tgi vZ/vi PvmR` Gi mgq CFC_s thb vBMZ bv nq Zv vbmöZ KivZ nte| m`e
ntj cbt e`enviti i cO`Pov vbtZ nte| GQvov Gme CFC_s Drcv`bKvix`e`v`v i veki`Zvii
KivZ nte|

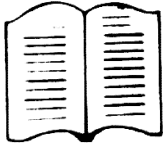
cw 3.5 evtqM`im I eR`e`e`lcbv



G cvl tk`l Avcwb -

- ◆ evtqM`im Kx Ges Gi e`envi m`ut`K`eY`v Ki`Z cvi`teb|
- ◆ evtqM`im `Zwi i tKŠkj wkL`Z cvi`teb Ges mP`mn Zv eY`v Ki`Z cvi`teb|
- ◆ eR`Kx Ges Gi `enkó` m`ut`K`ej`Z cvi`teb|
- ◆ eR`e`e`lcbvri tKŠkj mPw`Z Ki`Z cvi`teb|

evtqM`im Kx



tMvei I Ab`vb` cPbkxj `Re c`v`e` evqj Abg`w`wZ`Z `Re weRvi`Yi dtj wgt`_b (CH₄) M`im Drcb`enq| c`KwZK Dcv`q th mKj c`Yx Rvei Kv`U (thgbt tMv-gw`l, QvMj) Zv`i A`šj Ges Av` `Rb weeR`Z B`Kvj RxK`Vj GjvKv thgbt Rjv`x f`vq, müZmü`Z tFRv RvqMv, gqj v`h` c`wbi Avavi c`f`wZ. `vb t`_tKI wgt`_b M`im Drcb`enq| GB M`im iswenb Ges L`y mn`RB `vn`| `Re Dm t`_tK Drcb`etj GB M`im`K evtqM`im ejv nq|

evtqM`im e`envi I m`zav

- 1| evtqM`im Rjv`wb wntmte me ait`bi ivb`i Kv`R e`envi Kiv hvq| e`envi`i dtj nwo-cwZ`j, emo-Ni I Kvc`o-tPvc`to gqj v`cto bv|
- 2| GB M`im w`_tq iv`Z g`vUj tR`fj n`vRvK jvB`Ui gtZv Av`j v`civ qv hvq| tK`i wnt`bi weK`i wntmteI e`envi Kiv hvq| we`_y Drcv`_tbi Kv`RI evtqM`im e`euZ nq|
- 3| imvq`vMv`i tKvj M`im, G`v`i`v`Rb M`im ev t`ctUj M`im`i weK`i wntmte Kg Li`P GB M`im e`envi`i`M`|
- 4| tMvei I Ab`vb` cPbkxj `Re c`v`e`_t`_tK evtqM`im Dcwi wntmte cvl qv hvq| Gi c`ti úvix wntmte hv Aekó`_v`K Zv L`yB Dbz`g`v`bi `Re mvi | `Re-`nb c`l`u`qvi Kv`i`Y mKj AvMv`Qvi exR A`z`i`v`Mg `I`gZv nwi`_tq tdtj | dtj GB mvi e`envi`i Rvgt`Z AvMv`Qvi cwi gvYI nwm cvq|
- 5| evq`j`vax Ae`v`q cPb m`l`q m`z`b`enq etj tKvb `M`e` Qovq bv Ges gkv`g`w`Qi Dc`_eI _v`K bv|
- 6| GB M`im cwi`ewi`K cwi`tek`_tK cwi`Q`b`e`i`v`L`| weK`i Rjv`wb wntmte e`envi Kiv nq etj Dv`m`c Rjv`vbi Dci Pvc K`_tq hvq|
- 7| GKwU evtqM`im c-v`E` `f` cwi`mi` `v`_t`b Ggbw`K Rbeú`j GjvKv`ZI `Zwi Kiv m`e`| Gi c`š`Z c`š`vj x I i`q`Y`r`e`q`Y mnR Ges LiPI Kg|

tMvei I Ab`vb` cPbkxj
 `Re c`v`e`_t`_tK evtqM`im
 Dcwi wntmte cvl qv hvq|
 Gi c`ti úvix wntmte hv
 Aekó`_v`K Zv L`yB
 Dbz`g`v`bi `Re mvi |

evtqM`im c`U`wb`g`Y tKŠkj

GKwU evtqM`im c`v`E`i c`v`b Ask n`_Q WvB`R`v`i ev dvi`gt`E`kb U`v`/4 Ges M`im tnv`i` vi | Gi miv`_ mswkó`_v`K Bb`j U U`v`/4 ev Lv` Kbj x (Feeding Channel), w`Mg`b` b`j x I AvDU`_t`j U K`c Ges M`im mie`iv`n jvBb| GKwU evtqM`im c`v`E`i wev`f`b`e`A`st`ki AvKvi AvKwZ w`f`P` K`ti M`im`i Pw`n`v, e`euZ K`v`g`v`t`j i cwi gvY, aiY BZ`w`i Dci |

GLv`tb 4-5 wU Mi`_g`w`l Av`Q Ggb evox`Z 6/7 Rb cwi`ewi`K m`_t`m`i Rjv`wb Pw`n`v` t`gUv`_t`b Dc`_t`h`v`Mx GKwU evtqM`im c`v`E`i eY`v` t`_qv n`_t`j`v`| c`l`_t`g 8 wDU Mf`xi I 7 wDU e`v`_t`m`i GKwU Ke Lbb Ki`Z n`_t`e`| LbbKZ.K`_t`ci Zj`v`q 3" Av`i.wm.wm Xij`v`B w`_t`Z n`_t`e`| GB Xij`v`B`_t`qi Dc`_t`i 6 d`_z` Af`_š`l`i`xY e`v`m I 8 d`_z` D`PZv wekó` 5 Bw`A` B`_t`Ui Mv`_l`_j`x w`_t`q GKwU t`Mj`v`Kvi

ertqm`im cävÈ Pvj Kivi

ubgP tktl G aitbi M`im cävÈ cÜg Pvj Kivi Rb` 40/50 gY tMvei cÜqRb| tMvei I cmb 1:1 AbgvtZ uguktq úvix (tMveti i`èY) `Zwi Kti wclwS Uvt`i gta` tXtj w`tj B Zv `Z WvBtR ÷vti tcsÜte| wclwS Gi mgq M`im tnvì vi evqykè` Kivi Rb` M`im jvBb tLjv ivLtz nq| WvBtR ÷vi Uv¼ fivZ`nevi ci úBj KK`eÜ Kti M`im jvBtbi msthvM w`tZ nq| KtqK w`tbi gta`B M`im Rgv ntq M`im tnvì vi Dcti i w`tK Dtv hvte| cÜg w`tK M`im tnvì vti wKQyKveB WvB-A. vBW Rgv nevi Kvi tY Zv bvl RjtZ cvti | tm t`jt` M`im tnvì vti RgvKZ.m`úY`M`im tei Kti w`tZ nte| cÜtgB úvixi mvt_ wKQycwi gvY jvBg ev Pz (CaO) uguktq w`tj ertqm`im Drcv` bKvix e`vKtUwi qvi Kiv`gZv evx cvq Ges KveB-WvB-A. vBW Drcv` b nvm cvq| ubqvgZ M`im mieivn A`j`x`eivLvi Rb` cÜZv b 4/5 evj wZ tMvei I mgcwi gvY cmb uguktq wclwvi P`vtbtj i gra`tg WvBtR ÷vti cÜek KivtZ nte|

GLvfb Dvj -LthvM` th, Used up slurry ev Effluent M`im Drcv` tbi ci hv tei ntq Avtm Zv AZ`sí Dbz gvftbi `Re mvi wntmte gwUtz e`envi Kiv thtZ cvti | G mvti 1.58% bvtUttRb, 1.2% dmtDU (P₂O₅) Ges 0.7% cUvk (K₂O) _vtK|

mZKZv

- 1| WvBtR ÷vti hvZ evj cmb bv XzK Zvi Rb` wclwS Uv¼ WvBtR ÷vi t`tK mvgvb` Dcti _vKv ev`Abxq| cÜqRtB Dcti tkW `Zwi Kiv thtZ cvti |
- 2| WvBtR ÷vti tMvei-cmb cÜekKvtj Ab` tKvb AveR`v hvZ bv XzK Zv j`j ivLtz nte|
- 3| M`im tnvì vi wU gvts gta` tK`xq cvBtci Pri w`tK Nvj`tq w`tj Dcti tMvei I cmbi ugkY k³ ntZ cvt te bv|
- 4| tKvb Kvi tY Bbtj U ev AvDUtj U cvBc eÜ ntq tMvj tmvRv miyKwv w`tq Zv Qvotq w`tZ nte|
- 5| tKvb mgq M`im jvBtb cmb Rgtj cmb Rgv`vb Lvj cmb tei Kti w`tZ nte|



Ablyj b (Activity) t ersj vt`k ertqm`im cävÈ Pvj Kivi Yi m`tebv I mgm`imgR wPvYZ Kiab|

eR`e`e`icbv

e`envi tktl e`i cwiZ`v³ th tKvb Astki bigB eR` ev AveR`v| Ab`K_vq, cYt-cÜqRvRvZKiY Qvov tKvb e`i Zvi e`envi thvM`Zv nmi`tq tdj tj ZvtKB eR``etj | eR` wevfbæaitbi ntZ cvti thgbt Kivb eR` (Solid waste) I j`wZKviK eR` (Hazardous waste)|

e`envi tktl e`i cwiZ`v³ th tKvb Astki bigB eR` ev AveR`v| Ab`K_vq, cYt-cÜqRvRvZKiY Qvov tKvb e`i Zvi e`envi thvM`Zv nmi`tq tdj tj ZvtKB eR``etj | eR` wevfbæaitbi ntZ cvti thgbt Kivb eR` (Solid waste) I j`wZKviK eR` (Hazardous waste)|

- 1| **Kivb eR` (Solid waste)** t Kivb eR` ejtZ tevSvq evox Ni t`tK tdtj t`qv AcZ`wKZ e`i; iv`li Svoyt`qv AveR`v, e`emv emvYR`, wKí cÜZövb, Kwl. Lvgyi cÜvZ. `vb ntZ gvbe Kiv`Kjvc mP AvvKwvLZ e`imgRtK| kniv`Atj Gme eR` (Refuse) Ges MÜgv`Atj AveR`v (Litter) wntmte cwi wPZ| Gmte gta` wevfbæaitbi Dcv`vb itqtQ, thgbt ajv, Lv`RvZ Dv`Qó, KivMR, avZe Dcv`vb, cÜóK, ivevi KivE, cwiZ`³ Kivco, emvftbi AveR`v, ubgPv mvgMöi tdtj t`qv Ask, c`wKs mvgMö,

Kwl.1 cj-x Dbqab`q

ukíRvZ eR^o, ukúbK'ij eR^o BZ'w | G Qrov itq̄Q Avi I eúnea `nbthM' I A`nbthM' mvgM̄ Ges tZRi^oq̄v c`v_^o eú aiþbi LvgiRvZ Dw'QóI KwB eR^o tkWYfz̄, thgbt tMvei I Mpcwvj Z ci-cmLi weö, LoKjv, ktm'i cwiZ'v³ Ask BZ'w |

bMi eR^o `enkó

evsjv`tk gv_vclZ eR^o
msM̄ni cwi gvY weþkj
Ab'v` t`þki Zj'bvq AþK
Kg| thgbt XvKvq gv_vclZ
cúZw`þbi Mo thLvtb gvI
0.22 tKwR tmLvtb Kj KvZvq
0.51 tKwR Ges wDBqfK
1.8 tKwR|

bM'ii AwaKvsk KwB eR^o M̄p, ukí I ewYwR'K Dm t_þK m̄p| cúZw`b RbcúZ Kx cwi gvY KwB eR^o msM̄pxZ nþe Zv bM'ii AvqZb, Ges FZz̄ Dci wbfP'kxj | evsjv`tk gv_vclZ eR^o msM̄ni cwi gvY weþkj Ab'v` t`þki Zj'bvq AþK Kg| thgbt XvKvq gv_vclZ cúZw`þbi Mo thLvtb gvI 0.22 tKwR tmLvtb Kj KvZvq 0.51 tKwR Ges wDBqfK 1.8 tKwR| XvKvq GZ Kg nI qvi cãvb KviY nqZ tmLvbKvi "Qef' msM̄ni e'e`v| bM'ii cãvb cãvb eR^o mgþni Zvwj Kvq itq̄Q tdþj t`qv Lv`", evRvi GjvKvi Dw'Qó, cvZv, Nvm, KwMR, cmóK mvgM̄, avZe c`v_^o K'vb, KtB, tevZj, BþUi UK'iv, e`ysk, fMæc, gqjv, QvB, KvV, Pvgov I ivevi RvZ `ëw` |

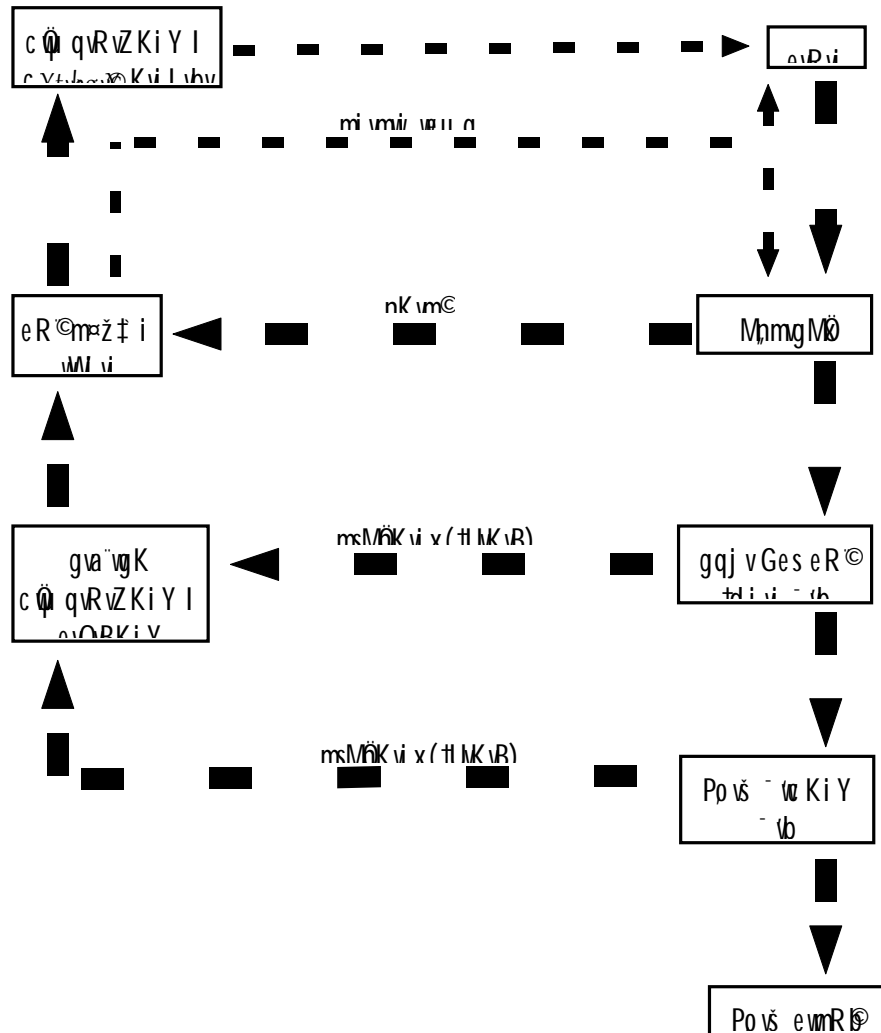
2| **¶wZKviK eR^o (Hazardous waste)** t Kwl, ukí I ewYwR' cãZw`þbi mKj Kvþig t_þKB ¶wZKviK ev weiv³ Dcv`vb m̄p nq| AwaKvsk t¶þT̄B Gme Dcv`vþb kZKiv 75 fvþMi I cþi _vþK i v̄m̄qubK `ë`| Drcbænevi ci t_þKB G mKj Dcv`vb `xN^ovqx mgm'vi m̄p Kþi| GiU thgbt Dbz̄ weþkj Rb` c`hvR`, tZgub Abyz̄ weþkj Rb`I c`hvR`| GmKj i v̄m̄qubK `ë`w evqy cwb Ges Avqv`i cúZ'wK Rxeþb c`eþki mþhM Kþi tbq| GK Z_` weeiYxþZ cKvk XvKvi eyoM'v b`xþZ cúZw`b 49,000 wK.M̄. ukí RvZ eR^o t̄djv nþ"Q| PÆM̄þgi KYeþx b`xþZ I cúZw`b 45,000 wK.M̄. ukí RvZ eR^o t̄djv nþ"Q| GmKj eR^o KviþY eyoM'v I KYeþx b`xi cwbþZ `i, t̄m̄vgqig, K'wM̄qig I Avit̄m̄bþKi gþZv fwi avZz̄ gvIv A`rfweKfite ewx t̄c̄q̄Q| Gi dþj b`x I Zrmsj MæDcKj xq Gj vKvq gvþQi Pvi Y I cRbb t¶þT̄ wébó nþ"Q|

eR^o e`vcbvi tKšj

AveR^o ev RÄvj wqšY Kivi Rb` gvþþi mvgþb th wZbwU c_ tLjv itq̄Q Zvi ms¶þB weeiY GLvtb Zþj aiv nþjv|

- (1) Dbþv`vþb, b`x, nã, m̄Mi ev Ab` tKvB Rjvktq AþkwaZ Ae`vq wþ¶þcb Kiv| G c̄þv̄qvi gj-`k̄, ð`-þYi mgvavb nþ"Q nuj KvKiYÓ ("The solution to pollution is dilution")| weþkj meþ GiUB eúj cþvj Z eR^o e`vcbvi Dcvq wntmte weþePZ| th KviþY bMi I ukí KviLv̄v, t̄jv m̄vaviYZ Rj cþ_i Zxi aþi M̄to DþvþQ|
- (2) weþkl fite wbeþPZ `vþb RÄvj `c̄vKZKiY Ges c̄q̄ c̄KwZK Dcvq weþqvRb NwUþq cbte`enriþhM' m̄u` m̄pKiY| `rfweK c̄KwZK `þY cwi nvi KviX GiUB mnRZg c×wZ| Gi gva`tg AwaK cwi gvþY eR^o gvþþi i `þ`i cãZ tZgb úguk m̄p bv KþiB cwi þkvab Kiv m̄e|
- (3) hwišK-i v̄m̄qubK c×wZ (Chemo-mechanical process) AbyriY Kþi cbte`enriþhM' m̄u` m̄pKiY| GB e'e`vi gva`tg hwišK Dcvq i v̄m̄qubK þkvab ðiv eR^o cwi þkvab Kþi cbte`enri DcþhMx Kiv nq| GB c×wZ `þY wqšY LgB KvþRix| wKŠ`e`qeúj c×wZ weavq wKQyKQyDbz̄ t`k Qrov meþ cþvj Z bq|

evsj v`tk thme eR^q mKQy evRvi Pwn`v itqtQ tm, tjv wZb chq msMh ev D^{xvi} Kiv nta v`tk| c₀g chq D^{xvi}i m₁ RwoZ v`tkb eroxi M₁Yxiv| Zviv KvMR, tevZj, Kb₁UBvri, c₁vZb K₁co, R₁Zv BZ`w` `e`w` (h₁v`i f₁v evRvi Pwn`v itqtQ) evQvB K₁tib Ges nKvi₁ i w₁KU w₁μq K₁tib| w₁Zxq chq itqtQ ew`I G₁vKvi `wi`^aki₁iv h₁vi v₁U₁KvB₁ b₁tg c₁vPZ| Giv f₁U₁ K₁U, K₁v₁b, K₁v₁W₁ev₁W₁^o t₁d₁tj t`qv KvMR, w₁Q₁bae`₁ c₁m₁oK m₁vgM₁, avZe cv₁I, I t₁d₁tj t`qv Ab₁v₁b` m₁vgM₁ msM₁h K₁tib| ZZxq chq₁ itqtQ `h₁i`^atk₁Yi t₁U₁KvB₁v| Zviv t₁c₁Ši m₁f₁vi M₁v₁ox t`₁K P₁o₁š₁ i₁w₁M₁g₁ v`₁tb eR^o t₁d₁vi m₁g₁q Z₁v t`₁K evQvBKZ. eR^omsM₁h K₁tib|



IP₁ - 3.5 - 3 t tcŠi m₁f₁vi eR^o c₁yte`envi KiY c₁x₁vZ

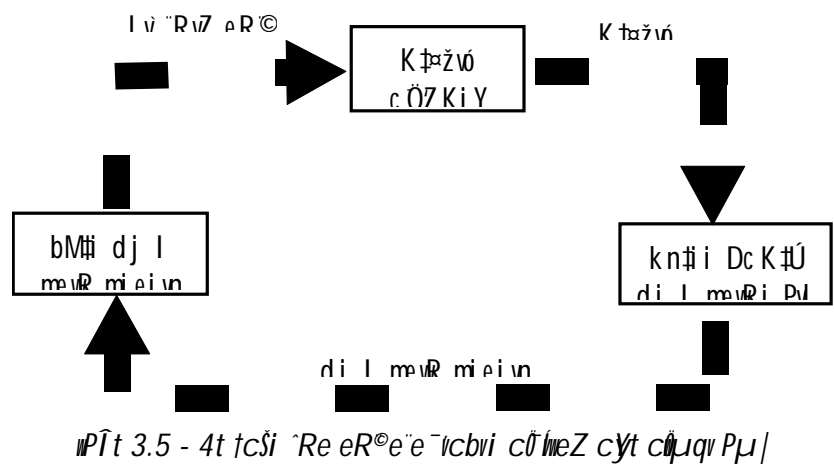
evsj v`tk eR^o e`v c₁yte`envi D₁ch₁v₁M₁K₁i₁t₁Yi chq, tjv IP₁ 3.5-3 Gi gva`tg t`L₁tbv nta₁qtQ| nK₁vi, t₁U₁KvB Ges AveR₁ v₁ t₁d₁vi v₁b t`₁K msM₁h₁K₁vi₁t₁ i gva`tg msM₁pxZ `e`w` c₁v₁Zb `e` w₁μq₁K₁vi₁t₁ i t`₁v₁Kv₁b t₁c₁Š₁Q| Zviv tm, tjv Z₁v₁Y₁W₁K₁f₁te, taŠZKiY, evQvBK₁Y c₁μ₁qv t₁kt₁l w₁W₁j₁vi₁t₁ i w₁KU mi₁ei₁v₁n K₁tib| c₁v₁Zb m₁vgM₁i w₁W₁j₁vi MY h₁_v₁h_ c₁_K₁i₁K₁i₁Yi ci mi₁v₁mi e`envi₁K₁vi₁t₁ i w₁KU w₁μq₁ K₁tib| Avi w₁μq₁ A₁th₁v₁M₁ `e`w` c₁yte`envi₁th₁v₁M₁K₁i₁Y K₁vi₁L₁v₁b₁q (Remolding factories) t₁c₁Š₁Y K₁tib| t₁m₁L₁v₁b t`₁K c₁μ₁qv₁R₁v₁Z₁K₁i₁t₁Yi ci c₁y₁v₁q Z₁v evR₁vi₁ v₁d₁t₁i Av₁t₁m|

Poš i₁emR₁ I v₁ek₁i e`v (Final disposal and alternative options)

Kv. 1.1 cj-x Dbqab -g

evRvi gj- AvtQ Ggb me eR[®]mgM[®] AmisMvibK cšiq cyiævi Kiv nq| Avi meqvrRKthvM[®] RieK Dcv vbmgn tLjv Ae vq bMti i Ačc[®]qvkZ. vPZvrb c[®]vkvi tdjt t[®]qv nq| Av[®] Rj evqyAAjt Gme e[®] v[®] cPbtbi dtj Zrmsj MeGj vKvq vM[®] Qmoq cto Ges Amv[®] Ki cwi tekki m[®]o Kti | e[®]vi c[®]vib gqjvi tci v[®]fZti c[®]lek Kti cwi tek v[®]Y[®]qZv Avi l emotq Zjt | Gt[®] i c[®]Pz v[®]Y[®] qZih[®] Pz[®]vib fvg l f[®]Mf[®] c[®]vibK v[®]Z Kti | Kg Li tP cwi tek v[®]Yg[®] Rec[®] v[®] memR[®]bi Dcvq n[®]tQ v[®] m[®]sz j v[®]Uvdj (Sanitary land fill) c[®]xvZ | GB c[®]xvZ tZ D[®]P v[®] HK c[®] v[®] msM[®]ni v[®]bivc[®] e[®] v[®] i v[®]Lv nq Ges v[®]gt[®] b M[®]vm msM[®]h Kti Ryj v[®]b v[®]ntmte e[®]envi Kiv nq, hvi e[®]Y[®] G c[®]v[®]Vi c[®]g[®]st[®]k t[®]qv n[®]tq[®]Q |

evQvBKZ. Re eR[®] Kg tcv[®]o c[®]uqv[®]i gva t[®]g Rem[®]ti i c[®]v[®]š[®]ti Z Kiv nq | G c[®]uqv[®] c[®]vi v[®]gZ c[®]vib e[®] v[®]K t[®]Uvi qv l AY[®]R[®]tei m[®]iv[®]th[®] Re Dcv vbmgn[®]ni v[®] c[®]Pb NiU[®]tq Zv Re m[®]ti c[®]vi YZ Kiv nq | c[®]vib mie[®]v[®]ni c[®]vi g[®]v[®]Y Re e[®]t[®]R[®] ai[®]t[®]Yi Dci v[®]b[®]f[®]pkj Ges G[®]v[®]U v[®]evZ (Aerobic) Ae v[®]q m[®]av[®]be Kiv nq | h[®]v[®]š[®]K Dcv[®]tq v[®]evZ M[®]teR Kg tcv[®]o c[®]uqv[®] (Aerobic garbage composting) ev[®]sj v[®]t[®] kmn A[®]tbK Dbq[®]bkj t[®]tkB A[®] v[®]o[®]v[®]ZK f[®]te j v[®]f[®]R[®]bK e[®]tj v[®]ete[®]v[®]PZ nq[®]v[®] | Aek[®] evQvBKZ. v[®]KQ[®]v[®]lKQ[®]v[®]Re eR[®] v[®]ri Z l P[®]tb D[®]meZ Ae v[®]Z K[®]t[®]av[®]o c[®]uqv[®] (Anaerobic composting) gva t[®]g m[®]ti c[®]vi YZ Kiv m[®]æ n[®]tq[®]Q | GB c[®]uqv[®] i Avy[®]Zt c[®]xvZ v[®]P[®] bs 3.5 - 3 Gi m[®]iv[®]th[®] t[®] Lv[®]tv n[®]tq[®]Q |



tcš[®] Gj v[®]K[®]vi Av[®]bab[®]th[®]v[®]M[®] eR[®] (Non-biodegradable waste) v[®]b[®]Pz[®]Gj v[®]K[®]vi f[®]i v[®]t[®]U[®]i K[®]v[®]R e[®]envi K[®]ti c[®]vi tek v[®]t[®]Yi g[®]v[®]l[®]v[®] K[®]g[®]v[®]tv m[®]æ |



c[®]v[®]W[®]ei gj- v[®]qb 3.5

m[®]v[®]K D[®]š[®]ti i c[®]v[®]tk v[®]UK v[®]P[®]y (✓) v[®]b |

1/ GK[®]v[®]U ev[®]t[®]qv[®]M[®]vm c[®]v[®]š[®]ti gj- Ask t[®]K[®]v[®]U?

- K) Bbtj U U'v¼
- L) Lv`K bj x
- M) WvBtR ÷vi
- N) AvDUtj U Kc

2/ M'im trvì vti e'im KZ nřZ nte?

- K) WvBtR ÷vti i mgvb
- L) WvBtR ÷vi Atc¶lv mgvb" tQvU
- M) WvBtR ÷vi Atc¶lv mgvb" eo
- N) th tKvb&gvtc i

3/ ubqvgZ M'im mi ei vn A¶lvai vLvi Rb" cŁZw b Kx cwi gvY tMveři i cŁqvRb?

- K) 40/50 UŁwi
- L) 8/10 UŁwi
- M) 4/5 UŁwi
- N) 2/1 UŁwi

4/ Mpcwvj Z ci i weov Kx ai řbi eR?

- K) Klvb
- L) Zij
- M) ¶wZKvi K
- N) řZRw`tj

5/ ¶wZKvi K eřR[®]mvavi YZ kZKi v Kx cwi gvY i vmvqubK Dcv`vb _vtK?

- K) 10 fvM
- L) 20 fvM
- M) 40 fvM
- N) 75 fvM

6/ `HY cwi nvi Kvi x mnR eR[®]e`e`vcbv c×wZ tKvbU?

- K) D=šj`vřb`cxKiY
- L) ube¶PZ`vřb weřqvRb NUřbv
- M) hvšK-i vmvqubK-c×wZřZ cYē`envi řhvM`KiY
- N) b`x ev Rj ıkřq řdřj ř`qv

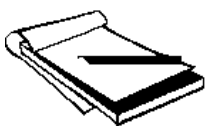
7/ ersj vt`řk tKvbU evRvi Pwv`řhvM" eR[®]msMñni AbyřZ c_ bq?

- K) mivmvi MvřYř`i vbKU ř_řK
- L) nKvi ř`i KvQ ř_řK
- M) řUvKvBř`i gva`řg
- N) weAvři gva`řg

Povřřgř`vqb

msv¶B I i Pbvřj-K cŁæ

1/ Mlv nvdR Břd± Kx? D`vni Ymn evřřq ej řj|



Kwl. I cj. x Dbqab ˘z

- 2/ tKvb Zt_ i wfiE tZ tmfvbtZ Ai tnbqvm Mbb nvdR cfrv m=utK@fiel ˘Z evYx Kti b?
- 3/ Ombb nvdR Mv tmi AeZ@v b cll_ex ivZivmZ cwiYZ nte cYnxb MbnO G Dw³uLi h_v_Zv- e˘vL˘v Kily|
- 4/ ewaZ RievkY Rvj wbi ci t_ tK Avenl qvMZ mgxKi tY th bZb gv˘v thvM ntqtQ Zv mst¶t c e˘vL˘v Kily|
- 5/ Mbb nvdR c@Zvµqv mwtZ avtbi Pvl I Mewi˘ ci i fvgKv eYb v Kily|
- 6/ evqtZ cwi gv tY ˘f ntj I CFCs M˘vm GZ , iZcY@Kb Zv e˘vL˘v Kti ej|
- 7/ GKwU cKZ.Mbb nvd tRi eYb v w b|
- 8/ otUwUqv t i Zvc-Kvvtgv msi ¶tY I tRvb ˘ti i fvgKv Avtj vPbv Kily|
- 9/ I tRvb ˘li ¶jqc@B ntj RieRM tZ Zvi c@Zvµqv eYb v Kily|
- 10/ bMi etR¶ ˘enkó mgn- Dc ˘vcb Kily
- 11/ eR˘e ˘vi Rb ˘ th mKj cŠv e˘envi Kiv nq Zvi msv¶B cwi Pq Ztj aily|
- 12/ Mbb nvdR cfrv t e i Kvi tY Avenl qri cwi eZb tnZzewócv tZi aı tbi th cwi eZb nte Zv Avtj vPbv Kily|
- 13/ evqyÚtj i Zvcgv˘v 2–5° tmt ewx tctj mvgv K c@Zvµqv eYb v Kib|
- 14/ Mbb nvdR cfrv t e meR MvQcij vi fvgKv Avtj vPbv Kily|
- 15/ Mbb nvdR cfrv e c@Zt i vta th mKj e ˘e ˘v MhY Kiv hvq Zv Dcv ˘vcb Kily|
- 16/ mth¶ AvZ te , bx i mki cfrv t e th c@µqv I Rb ˘li aısm c@B nh Zv evStq ej|
- 17/ I Rb ˘li aısm ntj gibe t ˘ tn thme RvUj Zv t ˘ Lv w ˘ te Zv wbtq Avtj vPbv Kily|
- 18/ I Rb ˘li ¶jqRvbZ Kvi tY Kwl i Dci c@Zvµqv e˘vL˘v Kily|
- 19/ evtqvM˘vm Kx? tKb G tK evtqvM˘vm ej v nq?
- 20/ evtqvM˘v tmi e˘envi m=utK@Avtj vPbv Kily|
- 21/ eR˘t_ tK Kg tcvó ˘Zvi Kivi c×wZ eYb v Kily|



DËigjv

cW - 3

- 1. M 2. L 3. M 4. N 5. K 6. L 7. M 8. K 9. L 10. M

cW - 3.1

1. L 2. L 3. M 4. L 5. M 6. L 7. K

cW - 3.2

1. K 2. L 3. L 4. M 5. L 6. M 7. K 8. L

cW - 3.3

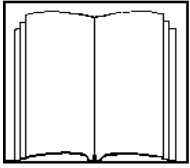
1. L 2. K 3. L 4. M 5. N 6. N 7. L

cW - 3.4

1. M 2. L 3. L 4. K 5. L 6. L

cW - 3.5

1. M 2. L 3. M 4. K 5. L 6. L 7. N



Z_mF

Avj g, Gg.Gm. BKeyj, uJ.Gg. Awgb, Gg.Gm. I Mvddvi, Gg.G. 1988 | Kul.ZmEK dmtj i Drcv`b I Dbqbb | cKvkK - uJ.Gg. RgvBi web BKeyj, mmiVRMÄ |

BKeyj, uJ.Gg.uJ. Mvddvi, Gg.G. Avj, Gg.GBP. Avj g, Gg.Gm. I Awgb, Gg.Gm. 1992 | Kul.ZtEji tgšij K melqvejx | cKvkK-mÄq Avj g mvg, 392 DEi kvnRvnbciy, XvKv |

Bmj vg, Gg.G. 1985 | gvQI Pvl I e`e`vcbv | evsj v GKvWgx, XvKv |

Kšij, Gg.G. 1985 | evsj v`tki Lv`km` I A_Rix dmj | evsj v GKvWgx, XvKv |

Kšij, Gg.G. I Zij k`vi, Gg.Gb.AvB. 1981 | Kul.ZtEji tgšij bmvZ | evsj v GKvWgx, XvKv |
tNvl, Gm.me.tK. 1983 | e`enmi K Kul. meÄvb I tMv-cvj b | fvi Zx ek÷j, 6, igvbr_ gRgy`vi ÷xU, Kvj KvZv-700009 |

Alam, Z. 1994. Livestock Resources in Bangladesh, Present Status and Future Potential. BLRI, Savar, Dhaka.

Banerjee, G.C. 1989. A Textbook of Animal Husbandry (6th Ed.) Oxford & IBH Publishing Co. Pvt. Ltd. India.

Bhuiyan, S.I. and A.K.M. Rashiduzzaman. 1994. Environmental Preservation : International Laws and Islam. Thought Bank, Dhaka, Bangladesh.

BBS, 2000. Statistical Yearbook of Bangladesh. Bangaldesh Bureau of Statistics, Statistics Division, Ministry of Planning, Government of the People's Republic of Bangladesh.

BBS, 1999. Statistical Yearbook of Bangladesh. Bangaldesh Bureau of Statistics, Statistics Division, Ministry of Planning, Government of the People's Republic of Bangladesh.

BBS, 1994. Statistical Yearbook of Bangladesh. Bangaldesh Bureau of Statistics, Statistics Division, Ministry of Planning, Government of the People's Republic of Bangladesh.

Blakely, D.R. and C.T. Hrusa. 1989. Inland Aquaculture Development Handbook. Fishing News Books Ltd., England.

Department of Environmental Pollution Control. 1984. Report on Water Pollution of Buriganga River by Untreated Sewage Disposal of Dhaka City. Dhaka, Bangladesh.

Golderman G. and S. Rengam. 1987. Problem Pesticides, Pesticides Problems. International Organizations of Consumer Unions and Pesticide Action Network. 10830 Penag, Malaysia.

Hines, L.G. 1973. Environmental Issues - Population, Pollution and Economics. W.W. Norton & Company, Inc., New York. USA.

Kipps, M.S. 1970. Production of Field Crops. Tata McGraw-Hill Publishing Company Ltd. Bombay.

Murshed, S.M. 1993. The North-South Economic Interaction and the Environment in: Pacific Journal of Rural Development. Vol. III, No. 2, CIRDAP, Dhaka, Bangladesh.

SEEDS, 1984. Community Management of Waste Recycling: The SIRDO. SEEDS. No.8, P.1-15.