# EXECUTIVE SUMMARY

# (English & Hindi)

# OF

# KANHAPUR, LATIFPUR MALAKPUR SAND MINING PROJECT

**Village: Kanhapur, Latifpur Malakpur, Tehsil: Roorkee, District: Haridwar Garhwal, State: Uttarakhand**

**Area: 16.390 Ha, Proposed Capacity: 2, 48, 600 TPA**

## APPLICANT

**GARHWAL MANDAL VIKAS NIGAM LTD.**

**74/1 RAJPUR ROAD, DEHRADUN**

## Prepared By


GRASS ROOTS RESEARCH & CREATION INDIA (P) LTD.

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F-374-375, Sector-63, Noida, U.P.
Ph.: 0120- 4044630, Telefax: 0120- 2406519
*Email: eia@grc-india.com, grc.enviro@gmail.com*
*Website:* http://www.grc-india.com

GRC INDIA TRAINING & ANALYTICAL LABORATORY
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## INTRODUCTION

As per MoEF, New Delhi Gazette dated 14th September 2006 and amended thereof, the proposed mining project is categorized as **Category 'B'** project.

The project is being proposed by Garhwal Mandal Vikas Nigam (GMVN) Limited. The proponent has applied for mining lease in the name of Kanhapur, Latifpur Malakpur Sand Mining Project from the bed of River Solani over an area of 16.390 ha.

It has been proposed to mine around 2, 48, 600 tonnes per annum of minerals. The estimated project cost for the proposed project is Rs. 8.65 Lakhs.

## LOCATION

The proposed mining lease area falls in Survey of India Toposheet 53G13 (site) & 53K1.

The lease area is located in Village: Kanhapur, Latifpur Malakpur, Tehsil: Roorkee & District: Haridwar, Uttarakhand.

The mine lease co-ordinates are listed below:

**Block A**

| | |
|---|---|
| **Latitude** | 29°52'45.59"N to 29°52'39.99"N |
| **Longitude** | 77°54'3.73"E to 77°54'4.28"E |

**Block B**

| | |
|---|---|
| **Latitude** | 29°52'32.66"N to 29°52'19.54"N |
| **Longitude** | 77°54'34.66"E to 77°54'50.42"E |

## MINING

This is an open-cast mining project. The operation will be entirely manual with use of hand tools like shovel, pan, sieves, pick axes, etc.

Mining will be done in layers upto a depth of 1.5 m, leaving a safety distance of 25% of the width from either side of the banks of the river for bank stability and 100 m from the bridge.

The deposit will be worked from the surface of the bed upto 1.5 m bgl or above ground water level, whichever comes first. Hence, at no point of time mining will intersect with ground water table.

Mining will be done only during the day time and completely stopped during the monsoon season.

## RESERVE (AVAILABLE QUANTUM) AND PRODUCTION (EXTRACTABLE QUANTUM)

### Reserve (Available Quantum):

The mineable area has been considered with an ultimate depth of 1.5 meter from the surface for calculation of the reserve. For the tonnage estimation the reserve quantity is multiplied with the bulk density of 1.8 t/cum.

As per the above calculation, it has been estimated that the reserve is 2, 76, 000 tonnes.

### Production (extractable quantum):

Approx 2, 48, 600 tonnes will be excavated annually. Of which sand is likely to be replenished gradually due to sediment inflow.

The extractable quantum in the first year would be limited to the available quantum. The extractable amount for the further years may vary depending on amount/rate of actual replenishment.

## SITE FACILITIES AND UTILITIES

### Water Supply

Water will be provided to workers for drinking & domestic purpose. Water will also be required for dust suppression. A total of 1.8 KLD water will be required for the proposed project.

### Temporary Rest Shelter:

A temporary rest shelter will be provided for the workers near to the site for rest. In addition, First aid box along with anti-venoms to counteract poison produced by certain species of small insects, if any and Sanitation facility i.e. septic tank or community toilet facility will be provided for the workers.

**BASE LINE DATA**

Environmental data has been collected in relation to proposed mining for Air, Noise, Water, Soil, Ecology and Biodiversity.

**Table 9.1 Baseline Environmental Status**

| Attribute | Baseline status |
|---|---|
| Ambient Air Quality | Ambient Air Quality Monitoring reveals that the minimum & maximum concentrations of $PM_{10}$ amongst all the 5 AQ monitoring stations were found to be 69.8µg/$m^3$ at AQ4 and 91.0µg/$m^3$ at AQ3, respectively. As far as the gaseous pollutants $SO_2$ and $NO_2$ are concerned, the prescribed CPCB limit of 80µg/$m^3$ for residential and rural areas has never surpassed at any station. |
| Noise Levels | The results of the monitoring program indicated that both the daytime and night time levels of noise were well within the prescribed limits of NAAQS, at all the 5 locations monitored. |
| Water Quality | The ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed by drinking water standards promulgated by IS: 10500.<br>From surface water analysis results it is evident that most of the parameters of the samples comply with 'Category D' standards of CPCB, indicating its suitability for propagation of Wild life and Fisheries. |
| Soil Quality | Samples collected from identified locations indicate the soil is sandy loam type and the pH value ranging from 7.43 to 7.69, which shows that the soil is slightly alkaline in nature. |
| Ecology and Biodiversity | There is no wildlife sanctuary/national park/protected forest or conservation reserve within 10 km of the lease area. However there is one Schedule-I species and one Schedule-II species are found in the study area. |

**ANTICIPATED IMPACTS AND MITIGATION MEASURES:**

**LAND ENVIRONMENT:**

**Anticipated Impacts:**

- Undercutting and collapse of river banks.

- Excessive and unscientific riverbed material mining is a threat to bridges, dams and nearby structures.
- River bank cutting and erosion.
- Upstream erosion as a result of an increase in channel slope and changes in flow velocity.
- Downstream erosion due to increased carrying capacity of the stream
- Downstream changes in patterns of deposition.
- Changes in channel bed and habitat type.

**Mitigation measures:**

i. Since the project is mainly for sand and boulder excavation (soil deficient), no loss of top soil is involved.
ii. The silt and clay generated as waste will be used for plantation or filling up low lying area elsewhere.
iii. Mining will be done leaving a safety distance of 25% from the bank inwards for bank protection and 100 m from the bridge.
iv. In this activity, the work is proposed to be done manually which will avoid adverse effects associated with heavy machinery and their functioning.
v. The mining is planned in non monsoon seasons only, so that the excavated area gets replenished during the monsoon each year.
vi. Grasses and bushes which have fibrous roots at the first instance are proposed to grown along the banks which enhances the binding properties of the soil. Hence protecting the banks.
vii. The systematic and scientific removal of sand and boulder will not cause bed degradation.
viii. Restoration of bank will be ensured at the end of mine closure every year.

**WATER ENVIRONMENT:**

**Anticipated Impacts:**

Mining of sand from within or near a river bed has a direct impact on the physico-chemical habitat characteristics. These characteristics include in stream roughness elements, depth, velocity, turbidity, sediment transport and

stream discharge. Altering these habitat characteristics can have deleterious impacts on both in-stream biota and associated riparian habitat.

The detrimental effects, if any, to biota resulting from bed material mining are caused by following:

i. Alteration of flow patterns resulting from modification of the river bed
ii. An excess of suspended sediment
iii. Damage to riparian vegetation and in-stream habitat

The disturbance activities can also disrupt the ecological diversity in many ways.

**Mitigation measures**

Project activity will be carried out only in the dry part of the river bed. Hence, none of the project activities affect the water environment directly. In the project, it is not proposed to divert or truncate any stream. No proposal is envisaged for pumping of water either from the river or tapping the ground water.

In the lean months, the proposed sand mining will not expose the base flow of the river and hence, there will not be any adverse impact on surface hydrology.

The deposit will be worked from the top surface up to a maximum depth of 1.5m below ground level or above the ground water table whichever comes first. Hence mining will not affect the ground water regime as well.

Further mining will be completely stopped during the monsoon seasons to allow the excavated area to regain its natural profile.

**AIR ENVIRONMENT:**

**Anticipated Impacts:**

Emission of fugitive dust is envisaged due to:

- Mining Activities includes excavation and lifting of minerals. The whole process will be done manually. Therefore the dust generated is likely to

be insignificant as compared to mining processes involving drilling, blasting, mechanized loading etc.

- Transportation of minerals will be done by road using trucks. Fugitive dust emission is expected from the transportation of trucks on the haul roads.

**Mitigation measures**

The collection and lifting of minerals will be done manually. Therefore the dust generated is likely to be insignificant as there will be no drilling & blasting. The only air pollution sources are the road transport network of the trucks. The mitigation measures like the following will be resorted:

i. Water sprinkling will be done on the haul roads twice in a day. This will reduce dust emission further by 74% (*Ref. Haul road dust control by WR REED & JA Organiscak*). The same can be seen as shown in the graph in Section IV.
ii. Speed limits will be enforced to reduce airborne fugitive dust from vehicular traffic.
iii. Spillage from the trucks will be prevented by covering tarpaulin over the trucks.
iv. Deploying PUC certified vehicles to reduce their emissions.
v. Proper tuning of vehicles to keep the gas emissions under check.
vi. Monitoring to ensure compliance with emission limits would be carried out during operation.

**NOISE:**

**Anticipated Impacts:**

- Mental disturbance, stress & impaired hearing.
- Decrease in speech reception & communication.
- Distraction and diminished concentration affecting job performance efficiency.

**Mitigation measures**

The following measures have been envisaged to reduce the impact from the transportation of minerals:

i. The vehicles will be maintained in good running condition so that noise will be reduced to minimum possible level.
ii. In addition, truck drivers will be instructed to make minimum use of horns in the village area and sensitive zones.
iii. No such machinery is used for mining which will create noise to have ill effects.

Awareness will be imparted to the workers about the permissible noise levels & maximum exposure to those levels.

**BIOLOGICAL ENVIRONMENT**

**Anticipated Impacts:**

- Excessive and unscientific riverbed sand mining results in the destruction of aquatic and riparian habitat through large changes in the channel morphology.
- Access roads crossing the riparian areas will have impact on the species disturbing the ecosystem.
- Mining may drive away the wild life from their habitat, and significantly affect wildlife and nearby residents.
- Diminution of the quality and quantity of habitat essential for aquatic and riparian species.
- Reduction in the yield of agriculture due to deposition of dust on the leaves, etc. of the crops.
- Fragmentation of wildlife habitat and blocking of migratory paths/corridors. Isolation may lead to local decline of species, or genetic.
- Mining on the streambed, braided flow or subsurface inter-sand flow may hinder the movement of fishes between pools.

**Mitigation measures**

As the proposed mining will be carried out in a scientific manner, not much significant impact is anticipated, however, the following mitigation measures will be taken to further minimize it:

i. No mining will be carried out during the monsoon season to minimize impact on aquatic life which is mainly breeding season for many of the species.
ii. As the mining site has no vegetation, no clearance of vegetation will be done.
iii. Prior to closure of mining operations / during the rainy season the eroded bank will be restored / reclaimed to minimize negative impacts on aquatic habitats.
iv. Haul roads will be sprinkled with water which would reduce the dust emission, thus avoiding damage to the crops.
v. Mining will be carried out on the dry part of the lease area to avoid disturbance to the aquatic habitat and movement of fish species.
vi. No discard of food, polythene waste etc will be allowed in the lease area which would distract/attract the wildlife.
vii. No night time mining will be allowed which may catch the attention of wild life.
viii. If wildlife are noticed crossing the area, they will not be disturbed at all.
ix. Workers will be made aware of the importance o the wildlife and signage will be displayed at the sensitive areas to caution the workers & other passerby.
x. Access roads will not encroach into the riparian zones and if any riparian vegetation cleared off for the mining activity will be restored at the end of closure of mine.

**ENVIRONMENTAL MANAGEMENT PLAN (EMP) & ITS IMPLEMENTATION**

- Extraction will be done from the river bed leaving safety zone from bank & stream.
- The maximum working depth will remain above ground water table of the area.

- Provide health facilities to the workers & surrounding people in the impact area to reduce the health impacts.
- Ensuring wildlife protection & arranging awareness campaigns for the same.
- Minimize activities that release fine sediment to the river.
- Check on traffic load due to transportation & maintenance of evacuation route.
- Effective mitigation measures will be adopted to minimize disturbance during transportation & handling of minerals:
- Establishment of reclamation program with plantation of local/native & fast growing species
- Establishment of restoration plan during the closure of mine at the onset of monsoon season.
- Establishment of effective Disaster Management Plan to take timely precautionary measures to avoid effects of impending disasters.
- Establishment of effective Monitoring Program monitored by Environment Management Cell.

**BUDGET ALLOCATION FOR EMP IMPLEMENTATION**

| S. No. | Description | Measures | Capital Cost (Rs. in lakhs) | Recurring Cost (in lakhs/annum) |
|---|---|---|---|---|
| 1 | Health Facilities | Medical Camps and Awareness program | 1.0 | 0.6 |
| 2 | Wildlife Protection | • Importance of Wildlife(Awareness)<br>• Sign boards, information boards | -<br>0.5 | 0.05<br>0.1 |
| 3 | Mineral transportation and Handling | • Repairing and maintenance of Roads<br>• Water Sprinkling | 0.5<br>- | 0.6<br>2.4 |
| 4 | Restoration and Reclamation | • Plantation<br>• maintenance of Check dams and Retention | 1.0<br>- | 0.36<br>0.3 |

| | | | | |
|---|---|---|---|---|
| | | wall<br>• Restoration of banks | -<br><br> | 0.2 |
| **Total** | | | **3.0** | **4.61** |

**BENEFITS OF MINING**

**PHYSICAL BENIFITS**

The opening of the proposed project will enhance the following physical infrastructure facilities in the adjoining areas.

a. **Improvement in Road Transport/**road communication due to the proposed project and maintenance will also be done time to time.

b. **Market:** Generating useful economic resource for construction. Excavated mineral will provide a good market opportunity.

c. **Enhancement of green cover:** As a part of reclamation plan, plantation will be carried along the river banks or along the road sides or near the civic amenities.

a. **Creation of community assets** (infrastructure) like provision for drinking water, construction of school buildings, village roads/ linked roads, dispensary & health centre, community centre, market place etc, as a part of corporate social responsibility.

**SOCIAL BENEFITS**

a) **Increase in Employment** Potential due to the project activity. Employment opportunities will increase both directly as well indirectly.

b) **Contribution to the Exchequer** as the saleable minerals will be given royalty. Since the quarries will be leased out to successful allottees, mining operation in the state will get legalized and it will fetch income to the state exchequer.

c) **Increased Health related activities**: Healthcare promotional activities will be undertaken. Pre-placement & and Periodic medical checkups will be done, which will lift the general health status of the residents of the area. Health camps, medical aids, family welfare programs, immunization camp sports will be arranged.

d) **Educational attainments**: Educational activities will be promoted by the lessee. Awareness program will be arranged covering basic issues related to primary level education, environment, health and hygiene etc.

e) **Strengthening of existing community** facilities through the Community Development Programme.

**ENVIRONMENTAL BENEFITS**

a. Controlling river channel
b. Protecting of river banks
c. Reducing submergence of adjoining agricultural lands due to flooding.
d. Reducing aggradation of river level.
e. Protection of crops being cultivated along the river bank.
f. A check on illegal mining activity.

**CORPORATE SOCIAL RESPONSIBILITY**

A percentage of the project cost will be allotted for the Corporate Social Responsibility for activities related to education, social causes, healthcare & environmental.

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**Cykd v**

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| **ns'kkarj** | 77°54'3.73"E to 77°54'4.28"E |

**Cykd v**

| | |
|---|---|
| **v{kka'k** | 29°52'32.66"N to 29°52'19.54"N |
| **ns'kkarj** | 77°54'34.66"E to 77°54'50.42"E |

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minzoh xfrfofèk;ksa ds dkj.k Hkh ikfjfLFkfrdh; fofoèkrk dks dbZ :iksa esa uqdlku igqaprk gSA

**’keu ds mik;**

ifj;kstuk dk;Z unh ds dsoy lw[ks {ks= esa iwjk fd;k tk,xkA blfy, ifj;kstuk ds fdlh Hkh dk;Z dk i;kZoj.k ij dksbZ izR;{k izHkko ugha iM+sxkA ifj;kstuk esa fdlh Hkh izokg ds ekxZ esa ifjorZu vFkok mldh dkV&NkaV djus dk dksbZ izLrko ugha gSA unh ls ;k Hkwry ty ls ikuh iai ;k fudkyus dk dksbZ izLrko ugha gSA

izLrkfor [kuu unh ds izokg {ks= ls ugha fd;k tk,x blhfy, lrg dh tyfLFkfr ij dksbZ izfrdwy izHkko ugha iM+sxk

[kuu 1.5 ehVj dh xgjkbZ rd ;k Hkwty ds Åij rd fd;k tk,xk blfy, [kuu dk Hkwty iz.kkyh ij Hkh dksbZ izfrdwy izHkko ugha iM+sxkA
;gh ugha] [kuu dk;Z ekulwu ds nkSjku can dj fn;k tk,xk rkfd [kfur {ks= izk—frd :i ls iquHkZj.k gks ldsA

- **<u>ok;q i;kZoj.k %</u>**

**iwokZuqekfur izHkko %**

d- [kuu dk;ks± esa [kfutksa dk [kuu ,oa <qykbZ 'kkfey gSaA laiw.kZ izfØ;k gLrpkfyr gksxhA blfy, [kuu ds fMªfyax] foLQksV] e'khuh <qykbZ vkfn tSls dk;ks± dh rqyuk esa èkwy de iSnk gksxhA

[k- [kfutksa dh <qykbZ lM+d ekxZ ls Vªdksa ls fd;k tk,xkA igqap ekxZ ij Vªdksa dh vkoktkgh ls mM+us okyh èkwy dk mRltZu gks ldrk gSA

**’keu ds mik;**

[kfutksa dk laxzg vkSj <qykbZ dk dk;Z gLrpkfyr gksxhA blesa fMªfyax ;k foLQksV dk lgkjk ugha fy;k tk,xk blhfy, Vªdksa dk vkokxeu] ok;q iznw"k.k dk ,dek= lzksr gksxkA “keu ds fuEufyf[kr mik; viuk, tk,axs %

d- igqap ekxks± ij fnu esa nks ckj ikuh dk fNM+dko fd;k tk,xkA blls èkwy ds mRltZu esa 74 izfr'kr vkSj deh gksxh ¼*lan- MCY;wvkj jhM o ts, vkWxSZfuLdSd dk gkWy jksM MLV daVªksy*½A

[k- okguksa dh vkoktkgh ls mM+us okyh èkwy esa deh ykus ds eísutj xfr lhek,a ykxw dh tk,axhA

x- Vªdksa ij frjiky Mky dj Vªdksa ls gksus okys Nydko dh jksdFkke dh tk,xhA

?k- mRltZu dks de djus ds fy, ih;wlh (PUC) ds izek.ki= izkIr okgu pyk, tk,axsA

p- xSl mRltZu dks fu;af=r j[kus ds fy, okguksa dh leqfpr V~;wfuax dh O;oLFkkA

N- dk;Z ds nkSjku mRltZu lhek dk vuqikyu lqfuf'pr djus ds fy, fuxjkuh O;oLFkkA

- **<u>èofu %</u>**

**vuqekfur izHkko %**

- ekufld v'kkafr] ruko vkSj Jo.k 'kfDr dh {kh.krkA
- cksyus vkSj ckrphr djus dh 'kfDr esa dehA
- ,dkxzrk Hkax vkSj de gksuk & QyLo:i dk;Z fu"iknu {kerk izHkkfor A

**’keu ds mik;**

[kfutksa dh <qykbZ ls mRiUu izHkkoksa esa deh ds fy, fuEufyf[kr mik;ksa ij fopkj fd;k x;k gS %

d- okguksa dk vPNh pkyw gkyr esa j[kj[kko fd;k tk,xk rkfd èofu ;FkklaHko U;wure Lrj rd de dh tk ldsA

[k- blds vfrfjDr] Vªd pkydksa dks xkao ds lkFk&lkFk laosnu'khy {ks=ksa esa Hkksai dk mi;ksx de ls de djus dk funsZ'k fn;k tk,xkA

x- [kuu dk;Z esa ,slh fdlh Hkh e'khu dk mi;ksx ugha fd;k tk,xk ftlls izHkko Mkyus okyh èofu mRiUu gksA

?k- Jfedksa dks èofu ds fuèkkZfjr Lrjksa vkSj mu Lrjksa dk vfèkd ls vfèkd ikyu djus ds izfr tkx:d fd;k tk,xkA

- **<u>tSfod i;kZoj.k %</u>**

**iwokZuqekfur izHkko %**

- unh ds ry ls jsr ds vfr vkSj voSKkfud [kuu ds QyLo:i ty izokg dh vk—fr esa ifjorZu ds dkj.k tyh; vkSj rVorhZ izk—frd vkokl dk uk'k gksrk gSA
- rVorhZ {ks=ksa ls gks dj xqtjus okys igqap ekxks± dk isM+&ikSèkksa vkfn ij izHkko iM+sxk ftlls i;kZoj.k iz.kkyh vlqarfyr gksxhA
- [kuu ds dkj.k oU; tho vius vkokl {ks= ls nwj tk ldrs gSa] ftldk izHkko oU;thou ,oa lehi esa jgus okys yksxksa ij iM+sxkA
- tyh; ,oa rVorhZ thotxr ds fy, vko';d izk—frd vkokl dh xq.koÙkk vkSj ek=k esa dehA

- Qlyksa ds iÙkksa vkfn ij èkwy teus ds pyrs [ksrh dh mit esa deh A
- oU;tho ds izk—frd vkokl dk {kj.k vkSj izokl ikFkksa@xfy;kjksa dk vo#) gksukA foyxko ds QyLo:i LFkkuh; iztkfr;ksa ;k mRifÙk esa deh gks ldrh gSA
- èkkjk ry] iV~Vh izokg ¼czsMsM ¶yks½ ;k lrg dh jsr ¼baVj&lSaM½ ds [kuu ls tyk'k;ksa esa eNfy;ksa dh xfrfofèk ckfèkr gks ldrh gSA

**’keu ds mik;**

izLrkfor [kuu dk;Z oSKkfud <ax ls fd;k tk,xk] blfy, xaHkhj izHkko dh laHkkouk ugha gS] fdarq] bldss izHkko vkSj de djus ds fy, fuEufyf[kr mik; fd, tk,axs %

d- tyh; thoksa ij iM+us okys izHkko dks de djus ds fy, ekulwu ds ekSle nkSjku] tks dbZ thoksa ds tuu dk ekSle gksrk gS] dksbZ [kuu dk;Z ugha fd;k tk,xkA

[k- [kuu LFky ij dksbZ ouLifr ugha gS] blfy, ouLifr dh lQkbZ ugha dh tk,xhA

x- igqpa ekxks± ij ikuh dk fNM+dko fd;k tk,xk ftlls èkwy mRltZu esa deh vkSj Qlyksa ds uqdlku dh jksdFkke gksxhA

?k- tyh; thoksa ds izk—frd vkokl vkSj eNfy;ksa dh xfrfofèk dks ckfèkr gksus ls cpkus ds eísutj [kuu dk;Z iV~Vk {ks= ds dsoy lw[ks {ks= ij fd;k tk,xkA

p- Hkkstu ds twBu] ikWfyFkhu ds dwM+s ds izfr oU;thoksa esa vkd"kZ.k gks ldrk gS] blfy, iV~Vk {ks= esa ,sls inkFkZ Qsadus dh vuqefr ugha gksxhA

N- ;fn oU;tho {ks= ls xqtjrs ns[ks tk,a] rks mUgsa fdlh Hkh rjg ls ckèkk ugha igqapkbZ tk,xhA

t- Jfedksa dks oU;thoksa ds izfr tkx:d fd;k tk,xk vkSj Jfedksa rFkk vU; vkus&tkus okys yksxksa dks lpsr djus ds fy, laosnu'khy {ks=ksa ij ladsr yxk, tk,axsA

>-- igqap ekxZ rVorhZ {ks=ksa dk vfrØe.k ugha djsaxs vkSj [kuu dk;Z ds fy, ;fn dksbZ ouLifr dkVh tkrh gS rks [kuu dk;Z iwjk gks tkus ij iqu% o`{kkjksi.k fd;k tk,xkA

- **<u>i;kZoj.k izcaèku ;kstuk ¼b,eih½ ,oa mldk dk;kZUo;u</u>**
  - laxzg rV vkSj èkkjk ls lqjf{kr {ks= NksM+rs gq, unh ry ls fd;k tk,xkA
  - dk;Z dh vfèkdre xgjkbZ {ks= ds Hkwty Lrj ds Åij jgsxhA
  - LokLF; ij iM+us okys izHkkoksa dks de djus ds fy, izHkko {ks= esa Jfedksa vkSj vklikl ds yksxksa dks LokLF; lqfoèkk,a eqgS;k djkbZ tk,axhA
  - oU;tho laj{k.k lqfuf'pr dh tk,xh vkSj blds fy, tkx:drk vfHk;ku pyk, tk,axsA
  - ,slh xfrfofèk;ka de dh tk,axh ftuds QyLo:i lw{e ryNV unh esa igqap ldsA

- <qykbZ vkSj fudkl ekxZ ds j[kj[kko ds pyrs ifjogu ij iM+us okys Hkkj ij fu;a=.k j[kk tk,xkA
- ifjogu vkSj [kfut inkFkks± ds j[kj[kko ds nkSjku mRiUu gksus okyh xM+cM+h dks de djus ds fy, U;wuhdj.k ds izHkko'kkyh mik; viuk, tk,axs %
- LFkkuh;@ewy ,oa rsth ls c<+us okys thoksa ds fy, lqèkkj dk;ZØe dk lapkyuA
- ekulwu _rq ds vkus ds le; [kuu ds canh ds nkSjku uohuhdj.k ;kstuk dk fØ;kUo;uA
- laHkkfor vkinkvksa ls cpus ds fy, le; ij ,gfr;krh mik; viukus gsrq izHkko'kkyh vkink izcaèku ;kstuk dk fØ;kUo;uA
- i;kZoj.k izcaèku izdks"B }kjk izHkko'kkyh fuxjkuh dk;ZØe dk fØ;kUo;uA

## bZ-,e-ih- dss fy, ctV vkoaVu

| **Øe la** | **fooj.k** | **mik;** | **lkwathxr Ykkxr ewY;** :- yk[kksa esa | **vkoZrh ewY;** #- Ykk[kksa esa@lkykuk |
|---|---|---|---|---|
| 1 | LokLF; lqfo/kk | esfMdy dSEi vkSj tkx#drk izksxzke | 1.0 | 0.6 |
| 2- | ou thoksa dk laj{k.k<br>[kfut dk | & OkU; thoksa dk egRo ¼tkx:drk½<br>& lkbu cksMZ | -<br>0.5 | 0.05<br>0.1 |

| | | | | |
|---|---|---|---|---|
| | j[k[kko vkSj lapkyu | & lwpuk cksMZ | | |
| 3- | [kfut dk j[k[kko vkSj lapkyu | & lM+dksa dh ejEer vkSj j[kj[kko<br>& ty fNM+dko | 0.5<br>- | 0.6<br>2.4 |
| 4- | iqokZoLFkk dh izzkfIr | & o`{kkjksi.k<br>& ck/kkas dh ckf/kr nhokj dk j[k j[kko<br>& fdukjksa ds ejEer dk;Z | 1.0<br>-<br>- | 0.36<br>0.3<br>0.2 |
| **dqy** | | | **3.0** | **4.61** |

- **[kuu ds YkkHk**

**i HkkSfrd ykHk**

izLRkkfor ifj;kstuk ds izkjaHk gksus ls vklikl ds fuEufyf[kr {ks=ksa esa HkkSfrd cqfu;knh <kaps dks c<kok feysxkA

d- lM+d ifjogu ;k lM+dksa laidZ esa o`f)

[k- [kfut ls vPNs cktk+jh volj feysaxsA

Xk- gfj;kyh /o`{kkjksi.k dks c<kok

?k- leqnkf;d ifjlaifÙk;ksa dk l`tu ¼cqfu;knh <kaps½

**Lkkekftd ykHk%**

d½ jkstxkj esa o`f)

[k½ jktdks'k esa va"knku ¼[kfut fd fcØh ls jktLo izkIr gksxk½

]Xk½ LokLF; lacaf/k xfrfof/k;k dks c<kok

?k½ “kSf{kd xfrfof/k;ka cukus vkSj mudks c<+kok nsus dh ;kstukA

M-½ rRdkyhu leqnk; dk lqn`<+hdj.k lkeqnkf;d fodk; dk;ZØe ds ek/;e ls lqfo/kk dk;ZØeA

**i;kZoj.kh; ykHk%**

d½ ufn;ksa dh /kkjkvksa ij fu;a=.kA

[k½ ufn;ksa ds fdukjksa dh lqj{kkA

Xk½ ck< ds dkj.k vkl&ikl ds {ks=kas ds d`f’k Hkwfe dks de ls de tyeXu gksus ls cpkukA

?k½ unhs Lrj ds mPp;u dks de djukA

aM+½ unh ds fdukjksa ds vkl ikl ij mxh Qlyksa dh lqj{kkA

p½ voS/k [kuu jksdus ds mik;A

- **f**uxfer (**dkiksZjsV**) **lkekftd nkf;Ro**

**f**uxfer (**dkiksZjsV)** lekftd nkf;Ro xfrfof/k;ksa ds fy, ifj;kstuk ykxr dk va”k vkoafVr fd;k tk,xk] TkSls f”k{kk] lkekkftd dkj.k] LOkkLF; ,oa i;kZoj.k ns[kHkkyA

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