

Project Profile

Project Title: Chitwan Habitat Restoration -III

Project Number: 99-268-077

Grant Supported by : Save the Tiger Fund, USA

Implementing Agency: King Mahendra Trust for Nature Conservation (KMTNC)
Jawalakhel, Lalitpur, NEPAL

Project Period: July 1, 1999 to June 30, 2000

1 BACKGROUND

The Royal Chitwan National Park (RCNP) is the first National Park of Nepal, located in the south-central part of the country along the Rapti river valley. The park is well known for endangered wildlife species such as one horned rhinoceros, bengal tiger and Asian elephant. It is also a prime habitat of other ungulates including spotted deer, hog deer, sambar deer and wild boar (Laurie 1978, Mishra 1982, Jnawali 1995). Lentic and lotic aquatic systems within the park provide suitable home for crocodiles, sub-tropical fishes and other aquatic animals.

Geographically, Rapti river valley (dun) is a synclinal basin within the Siwalik mountain range, closed in the south by the Someswar and the Churia hills and in the north by the Mahabharat mountain range (Laurie 1978). The subtropical flood plain varies from 1.5 km. to 15 km. in width. The average altitude of the area is approximately 200 m above the mean sea level (Laurie 1978).

King Mahendra Trust for Nature Conservation (KMTNC) has embarked its activities in the area since 1989 through its Nepal Conservation Research and Training Center (NCRTC) in close association with the Department of National Parks and Wildlife conservation (DNPWC) under the Ministry of Forest and Soil Conservation and local communities. Within a decade KMTNC/NCRTC with active partnership of local community has rehabilitated over 4,000ha of severely degraded forests in the periphery of RCNP. The community forests are not only helping in reducing the local pressure into the National Park but also helping in establishing a green belt in the buffer zone of the park. The forests are successful in meeting the demand of the firewood, timber, thatch grasses for local people and generating revenues from various tourism activities. The community forests are equally important in conserving the biodiversity of the area. Out of over 450 bird species recorded in RCNP, 162 species are found in the community forests. They are also creating potential habitats for wild animals including rhinoceros, tiger, leopard, hog deer, spotted deer, wild pigs, sambar deer, and barking deer. Local users groups are responsible for management of such community forests and the role of KMTNC in the overall process is only catalytic, facilitating the users groups for long term sustainability.

Save the Tiger Fund has been providing support to KMTNC for implementing conservation activities in RCNP area since last three years. The funds received are utilized mainly for the

rehabilitation of the degraded forest, monitoring of biological resources and management of the rehabilitated area. Over 1,500 ha is successfully rehabilitated in the buffer zone of RCNP from the support by now. There are six locally formed users' groups responsible for the management of the forests.

The report highlights the activities and achievements accomplished during the third year (1 July 1999 to 30 June 2000) of the Chitwan Habitat Restoration Program (CHRP - III) supported by the *Save the Tiger Fund*.

2 PROJECT ACTIVITIES

2.1 REGENERATION PROGRAM

Regeneration program for habitat restoration is one of the main components of the project. The component is designed mainly to restore degraded land and minimize the conflict between the park and the local people residing nearby for forest resources and wildlife depredation, which is one of the most pressing conservation problems in the national park.

In the third phase of the project (CHRP-III) over 300 ha of degraded forests in the northeastern buffer zone of RCNP (Ref. Map-1) was rehabilitated that falls between 84° 42' 00" N latitude and 84° 34' 15" E longitude. Before rehabilitation the area was severely degraded due to high grazing pressure and uncontrolled extraction of resources. Valid stakeholders of the forest have not been identified. Even people from nearby towns were exploiting the area for illegal hunting of deers and wild bores that occasionally visited in the area from the national park. These activities were highly threatening the biodiversity of the area to a larger extent. After execution of the project, the actual users of the forest were identified based on the currently sanctioned buffer zone bylaws and overall management responsibility of the area is handed over to the three different Users' Groups of Piple Village Development Committee (VDC) of Chitwan District. The area is subdivided into three management units namely Janashakti, Jayahari Janachetana and Bramhasthani community forests (Ref. Map- 2) based on the management responsibility of the different users groups. Each of the community forest is managed by two categories of users group: primary and secondary. The primary users refer to those who reside close to the forest and are the regular consumers of the forest products. However, the secondary users include people displaced

from the area in new location but are occasional user of the forest. Both of the users groups are now working jointly for the management of the area based on the share they extract from the forest. A brief description of these forests are given below:

2.1.1 Janashakti Buffer Zone Community Forest

Janashakti Buffer zone Community forest is located in the western most section of the area and occupies an area of 108 ha. The primary users of the forest are people from Piple VDC ward no – 5 (Nayabasti) and secondary users are the people from ward no. – 2 (Simara) of the same VDC. A total of 1,406 inhabitants of 220 household are the members of the community forest. A survey of the users group shows 736 cattle and 259 goats belonging to the users groups depend on the forests for fodder and grass.

Regeneration in Janashakti Buffer Zone Community Forest

2.1.2 Bramhasthani Community forest

This forest is located in the eastern side of the rehabilitation area. It covers an area of 136 ha. Altogether 1,502 people of 228 households of Piple VDC are the member of the community forest. Local people from ward no – 4 (Dubichaur) are the primary and the people residing in the ward no – 6 (Mahadevtar) are the secondary users of the forest. This forest includes 25 ha

of plantation, 93 ha of natural regeneration and 18 ha of barren land. In total 667 cattle and 372 goats belonging to the users group derive their resources from the forests.

2.1.3 Jayahari Janachetana Community forest

The community forest covers an area of 60 ha. It is located in between the two community forests. The local inhabitants of Piple VDC ward no – 1 (Jitpur & Pratappur) are the primary and ward no – 7 (Gadyauli) are the secondary users of the forest. The users group includes 917 individuals of 118 households. Livestock including 354 cattle and 475 goats are recorded belonging to the user's group that depends on the community forest for fodder and grass.

Increase in biodiversity after restoration of Bramhasthani Buffer Zone Community Forest

Management practices: The local users groups (UG) are responsible for the overall management of the community forests. All management decisions are done on participatory manner that includes regular meeting and interaction among members of users groups. However, for the day to day management of the community forest a Users Group Committee (UGC) consisting of eleven members is formed in each forest (Ref. appendix -1,2 and 3). The UGC forms rules and regulations for the management of the forest that will imply after the approval from the UG. Annual work plan and budget are approved by the annual general assembly of users' group held once in a year.

2.2 BIO-DIVERSITY MONITORING

Chitwan Valley is very rich in biological diversity. The community forests established by the project help to link the part of the Kuch Kuche corridor forest that is an important habitat for number of flora and fauna of the low land of Nepal. In long run the program will provide significant contribution in conserving the only remaining corridor biodiversity that connects the low land to the mid-hills of Nepal. Detail vegetation and animal surveys are conducted in the forests to assess the biological status of the community forest. Methodology adopted and findings of the survey are highlighted below.

2.2.1 Methodology and Result

A total of 63 plots were established for the vegetation survey. These include 9 plots (20x20 m²) for tree species, 18 plots (5x5 m²) for shrubs/bushes and 36 plots (1x1 m²) for herbs/forbs.

Altogether, 53 plant species are recorded during the survey (Ref. Appendix -4). Direct and indirect evidences in the community forests indicate increase in number of residential animal species with occasional sightings of tiger and rhinoceros. The survey's findings on biological resources in each community forest are dealt separately below:

1. Janashakti Community Forest

The forest consists of the riverine tree species like *Trewia nudiflora* (Vellor) and *Albizia sp.* (Padke). The other common tree species found in the area are *Acacia catechu* (Khair), *Dysoxylum binectariferum* and *Cassia fistula* (Raj Brikchya) (Ref. Appendix -5). Phytosociological analysis shows that the forest is *Trewia-Albizia* type.

The dominant tree species of the area is Vellor (*Trewia nudiflora*) whose density is 1,467 individuals per hectare. It is also noted that *Dysoxylum binectariferum*, *Acacia catechu* and *Albizia sp.* are chopped for fuel-wood. Local people considered Vellor (*Trewia nudiflora*) as a best fodder species and before protection of the area about 68% of the tree are found lopped for fodder. In the shrub/bushes category *Colebrookea oppositifolia*, *Pogostemon benghalensis* and *Murraya koenigii* are the most frequent species of the area. *Eupatorium adenophorum* is the most prominent shrub species (Ref. Appendix -6). In the herb/forbs

group *Salvia sp* is the most frequent and *Ageratum conyzoides* is the most prominent species found in the area (Ref. Appendix -7).

The wild animal sighted in the forest includes tiger (*Panthera tigris*), one-horned rhinoceros (*Rhinoceros unicornis*), Python (*Python molorus*), deer, Leopard (*Panthera pardus*) and Jungle Cat (*Felis chaus*) (Ref. Appendix -8). The permanent residential status of these animals are still not confirmed, however frequency of their sighting is increasing with the regeneration of the forests.

2. Jayahari Janachetana Community Forest

Situated in the central part of the regeneration area this forest has lowest tree diversity. *Albizia sp* (Padke), *Largestromia parviflora* (Botdhairo) and *Trewia nudiflora* (Vellor) are the only tree species recorded from the plot. The phyto-sociology study indicates the forest as *Albizia- Largestromia* type (Ref. Appendix -9).

The density of tree species in the forest is 1,300 tree per hectare. The dominant tree recorded in the forest is *Albizia sp* whose density is 1,100 individuals per hectare. Vellor is the best fodder tree in the area. More than 33% of it has been found lopped for fodder before the area was unprotected. In the shrub/bushes group *Murraya koenigii* is the most frequent and *Urtica dioica* is the most prominent species recorded (Ref. Appendix -10). In the herb/forbs type *Salvia sp* is the most frequent and *Ageratum conyzoides* is the most prominent species recorded (Ref. Appendix -11).

A total of 14 mammalian species are sighted from the forest including endangered species such as one-horned rhinoceros (*Rhinoceros unicornis*) and tiger (*Panthera tigris tigris*). Other common species found in the forest are Sambar Deer (*Cervus unicolor*), Spotted Deer/Chital (*Axis axis*), Leopard (*Panthera pardus*), Jungle Cat (*Felis chaus*), Barking Deer (*Muntiacus muntjak*) and Wildboar (*Sus scrofa*) (Ref. Appendix-12).

3. Bramhastani Community Forest

The forest consists of regeneration (68.35%), plantation (18.08%) and grazing ground (13.57%).

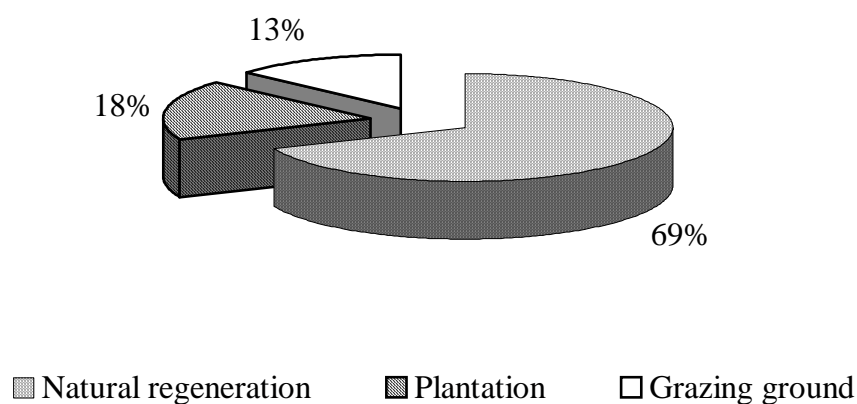


Figure - 1 percent values of different habitat types in Bramhasthani Community forest.

In the forest *Dalbergia sissoo*, *Trewia nudiflora*, *Albizia sp*, *Bombax ceiba*, *Acacia catechu* are the most frequently encountered tree species. Phyto-sociological analysis indicates that the forest is characterized as *Dalbergia-Trewia-Albizia* type (Ref. Appendix -13). The average height of the tree in the forest is 8 m and *Bombax ceiba* (30 m) is the tallest tree recorded in the community forest. The average diameter at the breast height (DBH) of the tree is 10.96 cm. The highest girth is recorded in *Trewia nudiflora* that measures 49 cm. The vegetation survey indicates that the forest consists of 1,650 tree per hectare. The dominant tree species of the area is *Dalbergia sissoo* whose density is 800 individuals per hectare. It is recorded that 6% of the Sissoo tree is chopped (for furniture or fuel-wood). Similarly, Vellor (*Trewia nudiflora*) is the best fodder tree in the area and 50% of which is found harvested. In the shrub/bushes category *Colebrookea oppositifolia*, *Pogostemon benghalensis*, *Murraya koenigii* and *Albizia sp* are the most frequent species found in the area. *Eupatorium adenophorum* is the most prominent shrub species of the area (Ref. Appendix -14). In the herb/forbs group *Salvia sp* and *Ageratum conyzoides* are most frequent and *Digitaria ciliaris* is the most prominent species found in the area (Ref. Appendix -15).

Seventeen species of animals are recorded from the community forest including the endangered one-horned rhinoceros (*Rhinoceros unicornis*) and other species such as Sambar

Deer (*Cervus unicolor*), Spotted Deer/Chital (*Axis axis*), Leopard (*Panthera pardus*) and Jungle Cat (*Felis chaus*) (Ref.Appendix –16).

2.2.2 Plant diversity

Plant diversity indices of Janashakti Community Forest shows that the forest has the highest tree diversity. Jayahari Janachetana Community Forest on the other hand is the least diverse in terms of tree species. In the bush/shrubs category the highest diversity is found in the Bramhasthani Community Forest and the least in case of Jayahari Janachetana Community Forest.

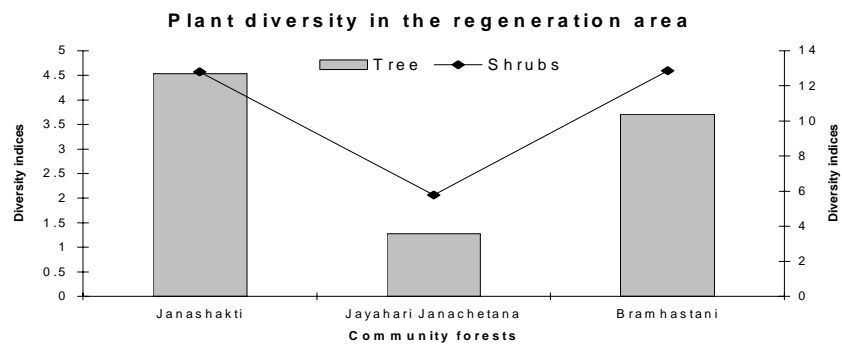


Figure 2 – Plant diversity in the project site.

2.2.3 Avian diversity

Technicians conducting regular bird inventory

In total, 33 species of birds are recorded from the three community forestry sites. Endangered species such as Pied Hornbill is also recorded from the area. The other common species found in the area are Barn Swallow, Tailor Bird, Green Bee-eater, Indian Treepie, Fivous Brested PW, Jungle Myna and Large Cuocal. The complete list of bird species recorded from the area is included in the Appendix - 17.

2.2.4 Wildlife survey in Kantheswari Community Forest

Kantheswari community forest is established with the support from the *Save the Tiger Fund* under CHRP II. In CHRP III the community forest is surveyed as a test site to assess the status of biodiversity after community management. Survey of wildlife in the Kantheswari Community forest shows that the number of wildlife species has increased from 14 (STF final technical report 1997) to 18 (Ref. Appendix -18). The newly adopted species in the area are Tiger (*Panthera tigris tigris*), Leopard (*Panthera pardus*), Jackal (*Canis aureus*), and Small Indian Civet (*Viverricula indica*). Similarly, bird monitoring indicates the increase in number of birds species from 94 (STF final technical report 1997) to 114 (Ref. Appendix 19). This indicates that the rehabilitated site is becoming a potential habitat for wildlife and birds.

2.3 USERS GROUP TRAINING/WORKSHOP

One day training on the "Community Forest Management" was conducted for the users group members on 23rd February 2000. All together 23 people from nine community forest users' group and three buffer zone users' groups participated in this training (Ref. Appendix -20). The main topics of the training were buffer zone concept and community forest management. The training program provided knowledge on the management plan preparation, role of Users Group Committees and Users Group, and role of grassland and wetlands in the biodiversity conservation.

2.4 SOCIO-ECONOMIC SURVEY OF USERS GROUPS

Socio-economic surveys of Janashakti, Jayahari Janachetana and Bramhasthani community forests users' groups were completed in the project period. Four personnel from these three community forest users' group were hired to collect the baseline data. The main aim of the survey was to gather data necessary for the management plan preparation. In the mean time, data on other variables like benefit or loss from the National park, livestock and crop depredation from wildlife were also collected. The preliminary result indicated that rhino is the main crop raider and its favorable crop is paddy. The main predator species is tiger and its favorable domestic prey is buffalo. Similarly, local people are using 30 species of plants for firewood, 49 species for fodder and 18 species for medicine. Management plan of the Community Forest will be prepared by the end of this year and the process of hand over to the community will be started.



Figure – 3: Number of wild plants used by the users' of Janashakti, Jayahari Janachetana and Bramhasthani Community Forests.

2.5 STUDY TOUR

Two study tours were organized during the project period with the aim to promote awareness among members of community forest users group. The first tour was organized from 9th to 12th January 2000 for 18 community members (Ref. Appendix -21). Similarly, second tour was organized from 24th to 27th February for 23 members (Ref. Appendix -22). Both these groups were taken to the Annapurna Conservation Area (Ghandruk) and Palpa (Mulgairi Community Forest of Madanpokhara) to demonstrate the successful examples of community based conservation models. During the interaction meeting after the tour all participants appreciated the concept of the educational tour and expressed their commitment for long-term conservation.

Interaction program between communities during study tour in Ghandruk

2.6 INVESTMENT ANALYSIS

Though investment analysis is proposed in the project period, due to unavailability of data in many community forestry sites, this component is carried over for the forth phase of CHRP. It is decided the grant allocated under the head to be used in purchasing GIS equipment. By the end of the forth phase of CHRP time series data from most of the community forestry sites will be available for conducting investment analysis.

Appendix 1 - Name of Users' Group Committee members of Janashakti Bufferzone Community Forest.

| SN | Name | Remarks |
|-----------|---------------------------|-----------------|
| 1. | Mr. Jitbahadur Tamang | Chairman |
| 2. | Mr. Rudrabahadur Laraula | Vice Chairman |
| 3. | Mr. Ranganath Silwal | Treasurer |
| 4. | Mr. Nirmalkumar Shrestha | Secretary |
| 5. | Mr. Bishnu Lamichhane | Joint-secretary |
| 6. | Mr. Ekraj Pathak | Member |
| 7. | Mr. Bheembahadur Shrestha | Member |
| 8. | Ms. Nandakumari Lama | Member |
| 9. | Mr. Hirabahadur B.K. | Member |
| 10. | Mr. Prembahadur Dimdim | Member |
| 11. | Mr. Dhanabahadur Lama | Member |

Appendix 2 - Name of Users' Group Committee members of Jayahari Janachetana Bufferzone Community Forest.

| SN | Name | Remarks |
|-----------|---------------------------|-----------------|
| 1. | Mr. Ekbahadur Rijal | Chairman |
| 2. | Mr. Dilbahadur Gurung | Vice Chairman |
| 3. | Mr. Birbahadur Rai | Treasurer |
| 4. | Mr. Krishnabahadur Pathak | Secretary |
| 5. | Mr. Jitbahadur Rai | Joint-secretary |
| 6. | Mr. Chiranjivi Magar | Member |
| 7. | Mr. Pramod Pande | Member |
| 8. | Mr. Kulbahadur Rai | Member |
| 9. | Mr. Cheesemani Silwal | Member |
| 10. | Mr. Krishnabahadur Rai | Member |
| 11. | Mr. Pepcha Rai | Member |

Appendix 3 - Name of Users' Group Committee members of Bramhasthani Bufferzone Community Forest.

| SN | Name | Remarks |
|-----------|-----------------------------|-----------------|
| 1. | Mr. Rudraprasad Thapaliya | Chairman |
| 2. | Mr. Dhalakbahadur Kalakheti | Vice Chairman |
| 3. | Mr. Uddab Tripathi | Treasurer |
| 4. | Mr. Bhojraj Thapaliya | Secretary |
| 5. | Mr. Tikadutta Chhatkuli | Joint-secretary |
| 6. | Mr. Premnarayan Gautam | Member |
| 7. | Ms. Harimaya Kunwar | Member |
| 8. | Mr. Laxman B. K. | Member |
| 9. | Mr. Krishnaprasad Rijal | Member |
| 10. | Mr. Chandrabahadur B. K. | Member |
| 11. | Mr. Meenraj Pande | Member |

Appendix 4 - List of plant species recorded from Janashakti, Jayahari Janachetana and Bramhasthani Community Forests.

| SN | Scientific name | Local name |
|-----------|------------------------------------|-------------------|
| 1. | <i>Acacia catechu</i> | Khair |
| 2. | <i>Achyranthes bidentata</i> | Datiwan |
| 3. | <i>Achyranthus sp</i> | -- |
| 4. | <i>Ageratum conyzoides</i> | Gandhe |
| 5. | <i>Albizia sp</i> | Padke |
| 6. | <i>Bombax ceiba</i> | Simal |
| 7. | <i>Caesalpinia decapetala</i> | Areli |
| 8. | <i>Callicarpa macrophylla</i> | Daikamala |
| 9. | <i>Casaeria elliptica</i> | -- |
| 10. | <i>Cassia fistula</i> | Rajbrikchya |
| 11. | <i>Cirsium wallichii</i> | -- |
| 12. | <i>Citrullus colocyanthus</i> | Indreni |
| 13. | <i>Clerodendrum viscosum</i> | Bhati |
| 14. | <i>Colebrookea oppositifolia</i> | Dhursul |
| 15. | <i>Corchorus aestuans</i> | -- |
| 16. | <i>Dalbergia sissoo</i> | Sissoo |
| 17. | <i>Dysoxylum binectariferum</i> | -- |
| 18. | <i>Ehretia laevis</i> | Datrunng |
| 19. | <i>Elephantopus scaber</i> | -- |
| 20. | <i>Elsholtzia blanda</i> | -- |
| 21. | <i>Eupatorium adenophorum</i> | Banmara |
| 22. | <i>Euphorbia hirta</i> | -- |
| 23. | <i>Flemingia macrophylla</i> | -- |
| 24. | <i>Galensoga sp</i> | -- |
| 25. | <i>Holarrhena pubescens</i> | Dudh Khirra |
| 26. | <i>Lagerstroemia parviflora</i> | Botdhairo |
| 27. | <i>Mallotus phillippensis</i> | Sindure |
| 28. | <i>Murraya koenigii</i> | Asare |
| 29. | <i>Murraya paniculata</i> | -- |
| 30. | <i>Oxalis corniculata</i> | Chari Amilo |
| 31. | <i>Parthenocissus semichordata</i> | -- |
| 32. | <i>Picrasma javanica</i> | -- |
| 33. | <i>Piper longum</i> | Pipla |
| 34. | <i>Pogostemon benghalensis</i> | Rudilo |
| 35. | <i>Polygonum sp</i> | -- |
| 36. | <i>Salvia sp</i> | -- |
| 37. | <i>Solanum sp</i> | -- |

| | |
|---------------------------------|-----------|
| 38. <i>Solanum surattense</i> | Kantakari |
| 39. <i>Sonchus sp</i> | -- |
| 40. <i>Stephania elegans</i> | Batulpate |
| 41. <i>Trewia nudiflora</i> | Vellor |
| 42. <i>Urtica dioica</i> | Sisnu |
| 43. <i>Coix sp</i> | -- |
| 44. <i>Cynodon dactylon</i> | Doobo |
| 45. <i>Cyperus difformis</i> | -- |
| 46. <i>Digitaria ciliaris</i> | -- |
| 47. <i>Imperata cylindrica</i> | Siru |
| 48. <i>Smilax perfoliata</i> | -- |
| 49. <i>Adiantum sp</i> | -- |
| 50. <i>Diplazium esculentum</i> | -- |
| 51. <i>Equisetum debile</i> | -- |
| 52. <i>Lygodium javanicum</i> | -- |
| 53. <i>Pteris sp</i> | -- |

Appendix 5 - Relative frequency, relative density, relative dominance and important value indices of tree species in the Janashakti Bufferzone Community Forest.

| Name of plants | Relative frequency | Relative density | Relative dominance | Important Value Indices |
|---------------------------------|---------------------------|-------------------------|---------------------------|--------------------------------|
| <i>Trewia nudiflora</i> | 21.43 | 66.67 | 32.00 | 120.09 |
| <i>Albizia sp</i> | 21.43 | 18.18 | 58.00 | 97.61 |
| <i>Acacia catechu</i> | 14.29 | 4.55 | 8.00 | 26.84 |
| <i>Dysoxylum binectariferum</i> | 14.29 | 3.03 | 0.50 | 17.82 |
| <i>Cassia fistula</i> | 7.14 | 3.03 | 0.20 | 10.37 |
| <i>Caesalpinia decapetala</i> | 7.14 | 1.52 | 0.90 | 9.56 |
| <i>Murraya koenigii</i> | 7.14 | 1.52 | 0.30 | 8.96 |
| <i>Ehretia laevis</i> | 7.14 | 1.52 | 0.10 | 8.76 |

Appendix 6 - Frequency, mean cover and prominence values of shrubs/bushes in the Janashakti Bufferzone Community Forest.

| Name of plants | Frequency | Mean cover | Prominence value |
|----------------------------------|------------------|-------------------|-------------------------|
| <i>Eupatorium adenophorum</i> | 0.17 | 75.00 | 30.62 |
| <i>Urtica dioica</i> | 0.67 | 30.00 | 24.49 |
| <i>Murraya koenigii</i> | 0.67 | 18.00 | 14.70 |
| <i>Pogostemon benghalensis</i> | 0.50 | 18.30 | 12.94 |
| <i>Colebrookea oppositifolia</i> | 0.67 | 11.60 | 9.47 |
| <i>Callicarpa macrophylla</i> | 0.33 | 7.50 | 4.33 |
| <i>Murraya paniculata</i> | 0.17 | 10.00 | 4.08 |
| <i>Caesalpinia decapetala</i> | 0.17 | 5.00 | 2.04 |
| <i>Picrasma javanica</i> | 0.17 | 5.00 | 2.04 |
| <i>Albizia sp</i> | 0.17 | 5.00 | 2.04 |
| <i>Ageratum conyzoides</i> | 0.33 | 3.50 | 2.02 |
| <i>Smilax perfoliata</i> | 0.33 | 2.50 | 1.44 |
| <i>Achyranthes bidentata</i> | 0.17 | 3.00 | 1.22 |
| <i>Casaeria elliptica</i> | 0.17 | 2.00 | 0.82 |
| <i>Diplazium esculentum</i> | 0.17 | 2.00 | 0.82 |
| <i>Stephania elegans</i> | 0.17 | 1.00 | 0.41 |
| <i>Clerodendrum viscosum</i> | 0.17 | 1.00 | 0.41 |
| <i>Lygodium javanica</i> | 0.17 | 1.00 | 0.41 |
| <i>Piper longum</i> | 0.17 | 1.00 | 0.41 |

Appendix 7 - Frequency, mean cover and prominence values of herbs/forbs in the Janashakti Bufferzone Community Forest.

| Name of plants | Frequency | Mean cover | Prominence value |
|---------------------------------|------------------|-------------------|-------------------------|
| <i>Ageratum conyzoides</i> | 0.50 | 58.30 | 41.22 |
| <i>Salvia sp</i> | 0.75 | 41.40 | 35.85 |
| <i>Coix sp</i> | 0.50 | 48.30 | 34.15 |
| <i>Cynodon dactylon</i> | 0.08 | 87.50 | 25.26 |
| <i>Oxalis corniculata</i> | 0.58 | 30.70 | 23.45 |
| <i>Adiantum sp</i> | 0.08 | 62.50 | 18.04 |
| <i>Digitaria ciliaris</i> | 0.25 | 25.00 | 12.50 |
| <i>Pogostemon benghalensis</i> | 0.08 | 37.50 | 10.83 |
| <i>Urtica dioica</i> | 0.17 | 20.00 | 8.16 |
| <i>Piper longum</i> | 0.33 | 2.50 | 1.44 |
| <i>Murraya koenigii</i> | 0.25 | 2.50 | 1.25 |
| <i>Eupatorium adenophorum</i> | 0.17 | 2.50 | 1.02 |
| <i>Clerodendrum viscosum</i> | 0.17 | 2.50 | 1.02 |
| <i>Achyranthes bidentata</i> | 0.17 | 2.50 | 1.02 |
| <i>Solanum sp</i> | 0.08 | 2.50 | 0.72 |
| <i>Dysoxylum binectariferum</i> | 0.08 | 2.50 | 0.72 |
| <i>Euphorbia hirta</i> | 0.08 | 2.50 | 0.72 |
| <i>Citrullus colocynthus</i> | 0.08 | 2.50 | 0.72 |
| <i>Solanum surattense</i> | 0.08 | 2.50 | 0.72 |
| <i>Murraya paniculata</i> | 0.08 | 2.50 | 0.72 |
| <i>Elephantopus scaber</i> | 0.08 | 2.50 | 0.72 |
| <i>Cyperus difformis</i> | 0.08 | 2.50 | 0.72 |
| <i>Imperata cylindrica</i> | 0.08 | 2.50 | 0.72 |
| <i>Sonchus sp</i> | 0.08 | 2.50 | 0.72 |
| <i>Achyranthes sp</i> | 0.08 | 2.50 | 0.72 |
| <i>Diplazium esculentum</i> | 0.08 | 2.50 | 0.72 |
| <i>Trewia nudiflora</i> | 0.08 | 2.50 | 0.72 |

Appendix 8 - Recorded wildlife from Janashakti Bufferzone Community Forest.

| SN | Common name | Scientific Name |
|-----------|-----------------------|---------------------------------|
| 1. | One-horned Rhinoceros | <i>Rhinoceros unicornis</i> |
| 2. | Sambar Deer | <i>Cervus unicolor</i> |
| 3. | Spotted Deer/Chital | <i>Axis axis</i> |
| 4. | Leopard | <i>Panthera pardus</i> |
| 5. | Jungle Cat | <i>Felis chaus</i> |
| 6. | Barking Deer | <i>Muntiacus muntjak</i> |
| 7. | Wildboar | <i>Sus scrofa</i> |
| 8. | Asiatic Jackel | <i>Canis aureus</i> |
| 9. | Common Mongoose | <i>Herpestes edwardsi</i> |
| 10. | Rhesus Macaque | <i>Macaca mulata</i> |
| 11. | Grey Fox | <i>Vulpes bengalensis</i> |
| 12. | Flying Squirrel | <i>Petaurista petaurista</i> |
| 13. | Brown Squirrel | <i>Callosciurus pygerythrus</i> |
| 14. | Palm Squirrel | <i>Funambulus pennanti</i> |
| 15. | Rabbit | <i>Lepus nigricollis</i> |
| 16. | Sloth Bear | <i>Melursus urcinus</i> |
| 17. | Python | <i>Python molorus</i> |
| 18. | Tiger | <i>Panthera tigris tigris</i> |

Appendix 9 - Relative frequency, relative density, relative dominance and important value indices of tree species in the Jayahari Janachetana Bufferzone Community Forest.

| Name of plants | Relative frequency | Relative density | Relative dominance | Important Value Indices |
|---------------------------------|---------------------------|-------------------------|---------------------------|--------------------------------|
| <i>Albizia sp</i> | 40.00 | 84.62 | 17.08 | 141.70 |
| <i>Lagerstroemia parviflora</i> | 20.00 | 3.85 | 78.25 | 102.10 |
| <i>Trewia nudiflora</i> | 40.00 | 11.54 | 4.68 | 56.22 |

Appendix 10 - Frequency, mean cover and prominence values of shrubs/bushes in the Jayahari Janachetana Bufferzone Community Forest.

| Name of plants | Frequency | Mean cover | Prominence value |
|--------------------------------|------------------|-------------------|-------------------------|
| <i>Urtica dioca</i> | 0.50 | 50.00 | 35.36 |
| <i>Murraya koenigii</i> | 1.00 | 8.00 | 8.00 |
| <i>Trewia nudiflora</i> | 0.25 | 15.00 | 7.50 |
| <i>Albizia sp</i> | 0.50 | 10.00 | 7.07 |
| <i>Pteris sp</i> | 0.25 | 10.00 | 5.00 |
| <i>Callicarpa macrophylla</i> | 0.50 | 5.50 | 3.89 |
| <i>Holarrhena pubescens</i> | 0.25 | 5.00 | 2.50 |
| <i>Pogostemon benghalensis</i> | 0.50 | 1.00 | 0.71 |
| <i>Mallotus philippensis</i> | 0.25 | 1.00 | 0.50 |

Appendix 11 - Frequency, mean cover and prominence values of herbs/forbs in the Jayahari Janachetana Bufferzone Community Forest.

| Name of plants | Frequency | Mean cover | Prominence value |
|------------------------------------|------------------|-------------------|-------------------------|
| <i>Ageratum conyzoides</i> | 0.25 | 48.80 | 24.40 |
| <i>Oxalis corniculata</i> | 0.50 | 16.90 | 11.95 |
| <i>Urtica dioca</i> | 0.25 | 23.60 | 11.80 |
| <i>Smilax perfoliata</i> | 0.38 | 19.20 | 11.76 |
| <i>Salvia sp</i> | 0.75 | 10.00 | 8.66 |
| <i>Digitaria ciliaris</i> | 0.50 | 10.00 | 7.07 |
| <i>Achyranthes sp</i> | 0.50 | 10.00 | 7.07 |
| <i>Euphorbia hirta</i> | 0.38 | 10.00 | 6.12 |
| <i>Piper longum</i> | 0.25 | 10.00 | 5.00 |
| <i>Stephania elegans</i> | 0.13 | 10.00 | 3.54 |
| <i>Flemingia macrophylla</i> | 0.13 | 10.00 | 3.54 |
| <i>Parthenocissus semichordata</i> | 0.13 | 10.00 | 3.54 |
| <i>Galensoga sp</i> | 0.13 | 10.00 | 3.54 |
| <i>Cynodon dactylon</i> | 0.13 | 10.00 | 3.54 |
| <i>Elephantopus scaber</i> | 0.13 | 10.00 | 3.54 |
| <i>Sonchus sp</i> | 0.13 | 10.00 | 3.54 |
| <i>Equisetum debile</i> | 0.13 | 10.00 | 3.54 |

Appendix 12 - Recorded wildlife from Jayahari Janachetana Bufferzone Community Forest.

| SN | Common name | Scientific Name |
|-----------|------------------------|-------------------------------|
| 1. | One-horned Rhinoceros | <i>Rhinoceros unicornis</i> |
| 2. | Sambar Deer | <i>Cervus unicolor</i> |
| 3. | Spotted Deer/Chital | <i>Axis axis</i> |
| 4. | Leopard | <i>Panthera pardus</i> |
| 5. | Jungle Cat | <i>Felis chaus</i> |
| 6. | Barking Deer | <i>Muntiacus muntjak</i> |
| 7. | Wildboar | <i>Sus scrofa</i> |
| 8. | Asiatic Jackel | <i>Canis aureus</i> |
| 9. | Common Mongoose | <i>Herpestes edwardsi</i> |
| 10. | Tiger | <i>Panthera tigris tigris</i> |
| 11. | Grey Fox | <i>Vulpes bengalensis</i> |
| 12. | Yellow Throated Martin | <i>Martes flavigula</i> |
| 13. | Rabbit | <i>Lepus nigricollis</i> |
| 14. | Sloth Bear | <i>Melursus urcinus</i> |

Appendix 13 - Relative frequency, relative density, relative dominance and important value indices of tree species in the Bramhasthani Bufferzone Community Forest.

| Name of plants | Relative frequency | Relative density | Relative dominance | Important Value Indices |
|-----------------------------|---------------------------|-------------------------|---------------------------|--------------------------------|
| <i>Dalbergia sossoo</i> | 14.29 | 48.48 | 34.50 | 97.27 |
| <i>Trewia nudiflora</i> | 28.57 | 24.24 | 16.80 | 69.61 |
| <i>Albizia sp</i> | 21.43 | 9.09 | 32.50 | 63.02 |
| <i>Bombax ceiba</i> | 14.29 | 9.09 | 13.50 | 36.88 |
| <i>Casaeria elliptica</i> | 7.14 | 3.03 | 1.00 | 11.17 |
| <i>Acacia catechu</i> | 7.14 | 3.03 | 1.00 | 11.17 |
| <i>Holarrhena pubescens</i> | 7.14 | 3.03 | 0.70 | 10.87 |

Appendix 14 - Frequency, mean cover and prominence values of shrubs/bushes in the Bramhasthani Bufferzone Community Forest.

| Name of plants | Frequency | Mean cover | Prominence value |
|----------------------------------|------------------|-------------------|-------------------------|
| <i>Eupatorium adenophorum</i> | 0.50 | 18.30 | 12.94 |
| <i>Colebrookea oppositifolia</i> | 0.75 | 13.80 | 11.95 |
| <i>Pogostemon benghalensis</i> | 0.75 | 12.50 | 10.83 |
| <i>Murraya koenigii</i> | 0.75 | 9.80 | 8.49 |
| <i>Albizia sp</i> | 0.75 | 7.70 | 6.67 |
| <i>Urtica dioica</i> | 0.17 | 10.00 | 4.08 |
| <i>Callicarpa macrophylla</i> | 0.50 | 5.50 | 3.89 |
| <i>Caesalpinia decapetala</i> | 0.13 | 10.00 | 3.54 |
| <i>Piper longum</i> | 0.13 | 10.00 | 3.54 |
| <i>Smilax perfoliata</i> | 0.17 | 5.00 | 2.04 |
| <i>Elsholtzia blanda</i> | 0.13 | 5.00 | 1.77 |
| <i>Dysoxylum binectariferum</i> | 0.13 | 5.00 | 1.77 |
| <i>Clerodendrum viscosum</i> | 0.13 | 1.00 | 0.35 |
| <i>Trewia nudiflora</i> | 0.13 | 1.00 | 0.35 |

Appendix 15 - Frequency, mean cover and prominence values of herbs/forbs in the Bramhasthani Bufferzone Community Forest.

| Name of plants | Frequency | Mean cover | Prominence value |
|----------------------------------|------------------|-------------------|-------------------------|
| <i>Digitaria ciliaris</i> | 0.50 | 43.10 | 30.48 |
| <i>Salvia sp</i> | 0.63 | 36.50 | 28.86 |
| <i>Ageratum conyzoides</i> | 0.63 | 31.30 | 24.74 |
| <i>Imperata cylindrica</i> | 0.13 | 48.80 | 17.25 |
| <i>Coix sp</i> | 0.06 | 62.50 | 15.63 |
| <i>Polygonum sp</i> | 0.06 | 62.50 | 15.63 |
| <i>Smilax perfoliata</i> | 0.13 | 36.30 | 12.83 |
| <i>Piper longum</i> | 0.19 | 27.50 | 11.91 |
| <i>Urtica dioica</i> | 0.13 | 23.80 | 8.41 |
| <i>Cynodon dactylon</i> | 0.13 | 23.70 | 8.38 |
| <i>Clerodendrum viscosum</i> | 0.06 | 10.00 | 2.50 |
| <i>Oxalis corniculata</i> | 0.06 | 10.00 | 2.50 |
| <i>Colebrookea oppositifolia</i> | 0.06 | 10.00 | 2.50 |
| <i>Cirsium wallichii</i> | 0.06 | 10.00 | 2.50 |
| <i>Corchorus aestuans</i> | 0.06 | 10.00 | 2.50 |
| <i>Pogostemon benghalensis</i> | 0.06 | 10.00 | 2.50 |
| <i>Achyranthes sp</i> | 0.06 | 10.00 | 2.50 |

Appendix 16 - Recorded wildlife from Bramhasthani Bufferzone Community Forest.

| SN | Common name | Scientific Name |
|-----------|-----------------------|---------------------------------|
| 1. | One-horned Rhinoceros | <i>Rhinoceros unicornis</i> |
| 2. | Sambar Deer | <i>Cervus unicolor</i> |
| 3. | Spotted Deer/Chital | <i>Axis axis</i> |
| 4. | Leopard | <i>Panthera pardus</i> |
| 5. | Jungle Cat | <i>Felis chaus</i> |
| 6. | Barking Deer | <i>Muntiacus muntjak</i> |
| 7. | Wildboar | <i>Sus scrofa</i> |
| 8. | Asiatic Jackel | <i>Canis aureus</i> |
| 9. | Common Mongoose | <i>Herpestes edwardsi</i> |
| 10. | Rhesus Macaque | <i>Macaca mulata</i> |
| 11. | Grey Fox | <i>Vulpes bengalensis</i> |
| 12. | Flying Squirrel | <i>Petaurista petaurista</i> |
| 13. | Brown Squirrel | <i>Callosciurus pygerythrus</i> |
| 14. | Palm Squirrel | <i>Funambulus pennanti</i> |
| 15. | Rabbit | <i>Lepus nigricollis</i> |
| 16. | Sloth Bear | <i>Melursus urcinus</i> |
| 17. | Python | <i>Python molorus</i> |

Appendix 17 - Recorded birds and their numbers from the piple rehabilitation area (Janashakti, Jayahari Janachetana and Bramhasthani Community Forest).

| SN | Common name | Number |
|-----------|-----------------------------------|---------------|
| 1. | Barn Swallow | 50 |
| 2. | Tailor bird | 4 |
| 3. | Green Bee-eater | 1 |
| 4. | Indian Treepie | 4 |
| 5. | Fuivous Brested Pied Woodpecker | 1 |
| 6. | Jungle Myna | 1 |
| 7. | Large Cuocal | 1-2 |
| 8. | Grey Tit | 1 |
| 9. | Hodgeson Prinia | 2 |
| 10. | Honey Kite | 1 |
| 11. | Black Drongo | 2 |
| 12. | Spotted Dove | 1 |
| 13. | Common Myna | 3 |
| 14. | Barred Owlet | 1 |
| 15. | Gray Crowned Pigmy Woodpecker | 1 |
| 16. | Robin Dayal | 1 |
| 17. | Three Toed Golden Back Woodpecker | 1 |
| 18. | Red Vented Bulbul | 1 |
| 19. | Chestnut Bellied Nuthatch | 1 |
| 20. | Hair Crested Drongo | 1 |
| 21. | Lineated Barbet | 1 |
| 22. | Black Partridge | 1 |
| 23. | Pea Fowl | 2 |
| 24. | Red Jungle Fowl | 1 |
| 25. | Common Quail | NA |
| 26. | Pied Hornbill | NA |
| 27. | Brown Fish Owl | NA |
| 28. | Red Wattled Lapwing | NA |
| 29. | Indian Roller | 2 |
| 30. | Blue Bearded Bee-eater | 2 |
| 31. | White-breaste Kingfisher | 1 |
| 32. | Little Egret | 1 |
| 33. | Sand Martin | NA |

Appendix 18 - List of wildlife recorded from Kantheswari Community Forest (Kathar VDC).

| SN | Common name | Scientific name | Observed number |
|-----------|-----------------------|---------------------------------|------------------------|
| 1. | One-horned Rhinoceros | <i>Rhinoceros unicornis</i> | 13 |
| 2. | Sambar Deer | <i>Cervus unicolor</i> | 12 |
| 3. | Spotted Deer/Chital | <i>Axis axis</i> | 45 |
| 4. | Rhesus Macaque | <i>Macaca mulata</i> | 30 |
| 5. | Wildboar | <i>Sus scrofa</i> | 3 |
| 6. | Sloth Bear | <i>Melursus ursinus</i> | 1 |
| 7. | Barking Deer | <i>Muntiacus muntjak</i> | 7 |
| 8. | Grey Fox | <i>Vulpes bengalensis</i> | 1 |
| 9. | Common Mongoose | <i>Herpestes edwardsi</i> | 2 |
| 10. | Porcupine | <i>Hystrix indica</i> | 1 |
| 11. | Rabbit | <i>Lepus nigricollis</i> | 1 |
| 12. | Brown Squirrel | <i>Callosciurus pygerythrus</i> | 3 |
| 13. | Palm Squirrel | <i>Funambulus pennanti</i> | 1 |
| 14. | Hog Deer | <i>Axis porcinus</i> | 2 |
| 15. | Asiatic Jackel | <i>Canis aureus</i> | 1 |
| 16. | Small Indian Civet | <i>Viverricula indica</i> | 1 |
| 17. | Tiger | <i>Panthera tigris tigris</i> | 1 |
| 18. | Leopard | <i>Panthera pardus</i> | 2 |

Appendix 19

Appendix 20 - List of participants in the "Community Forest Management Training" held on 23rd February 2000.

| SN | Name | Address |
|-----|---------------------------|---------------------------|
| 1. | Mr. Chandrabahadur Paudel | Chitrasen UG |
| 2. | Mr. Deependra Pande | Jaya-hari Jana-chetana UG |
| 3. | Mr. Chandrabahadur Rai | Jaya-hari Jana-chetana UG |
| 4. | Mr. Indrabir Rai | Jaya-hari Jana-chetana UG |
| 5. | Mr. Kalibahadur Praja | Kantkeswari UGC |
| 6. | Mr. Mangal Chaudhari | Kantkeswari UGC |
| 7. | Mr. Jayabahadur Khadka | Kankali UGC |
| 8. | Ms. Buddhimaya Moktan | Kankali UGC |
| 9. | Ms. Parbati Kandel | Bramhasthani UG |
| 10. | Ms. Antari Ghising | Bramhasthani UG |
| 11. | Mr. Krishnaprasad Pande | Bramhasthani UG |
| 12. | Mr. Salikram Pathak | Bufferzone Unit, Piple |
| 13. | Mr. Krishnaprasad Aryal | Kuchkuche UGC |
| 14. | Ms. Dilkumari Bhujel | Kuchkuche UGC |
| 15. | Mr. Ramnath Pathak | Bufferzone Unit, Kathar |
| 16. | Mr. Arjun Chaudhari | Raptiekata UGC |
| 17. | Ms. Pipla Praja | Raptiekata UGC |
| 18. | Mr. Ekraj Pathak | Janashakti UG |
| 19. | Mr. Lekhnath Khanal | Janashakti UG |
| 20. | Ms. Nandakumari Lama | Janashakti UG |
| 21. | Mr. Mangal Chaudhari | Bufferzone Unit, Bhandara |
| 22. | Ms. Harikala Dahit | Devithan UG |
| 23. | Mr. Jiyan Chaudhari | Devithan UGC |

Appendix 21 - List of participants in the first study tour organised from 9th to 12th January 2000.

| SN | Name | Address | Remarks |
|-----------|-----------------------------|-------------------------|----------------|
| 1. | Mr. Mitralal Pande | Raptiekata UGC | Chairman |
| 2. | Mr. Jalluram Chaudhari | Raptiekata UGC | Vice Chairman |
| 3. | Mr. Govindabahadur Kandel | Raptiekata UGC | Member |
| 4. | Mr. Kapilprasad Kattel | Kankali UGC | Chairman |
| 5. | Mr. Bharat Bhandari | Kankali UGC | Member |
| 6. | Mr. Jitbahadur Tamang | Janashakti UGC | Chairman |
| 7. | Mr. Rambahadur Lamichhane | Janashakti UGC | Advisor |
| 8. | Mr. Gunaraj Thapaliya | Janashakti UGC | Member |
| 9. | Mr. Bimalkanta Dallakoti | Janashakti UGC | Member |
| 10. | Mr. Birbahadur Rai | Jayahari Janachetana UG | -- |
| 11. | Mr. Chiranjivi Thapamagar | Jayahari Janachetana UG | -- |
| 12. | Mr. Dambarbahadur Rijal | Jayahari Janachetana UG | -- |
| 13. | Mr. Kedar Rimal | Jayahari Janachetana UG | -- |
| 14. | Mr. Dhalakbahadur Kalakheti | Bramhasthani UGC | Vice Chairman |
| 15. | Mr. Bhojraj Thapaliya | Bramhasthani UGC | Secretary |
| 16. | Mr. Pushparaj Oli | Piple VDC | Vice Chairman |
| 17. | Mr. Kedarkumar Shrestha | Chitrasen UGC | Member |
| 18. | Mr. Manbahadur Bhattra | Chitrasen UGC | Member |

Appendix 22 - List of participants in the second study tour organised from 24th to 27th February.

| SN | Name | Address | Remarks |
|-----------|---------------------------|---------------------------|-----------------|
| 1. | Mr. Chandrabahadur Paudel | Chitrasen UG | -- |
| 2. | Mr. Deependra Pande | Jaya-hari Jana-chetana UG | -- |
| 3. | Mr. Chandrabahadur rai | Jaya-hari Jana-chetana UG | -- |
| 4. | Mr. Indrabir Rai | Jaya-hari Jana-chetana UG | -- |
| 5. | Mr. Kalibahadur Praja | Kantkeswari UGC | Secretary |
| 6. | Mr. Mangal Chaudhari | Kantkeswari UGC | Joint Secretary |
| 7. | Mr. Jayabahadur Khadka | Kankali UGC | Member |
| 8. | Ms. Buddhimaya Moktan | Kankali UGC | Member |
| 9. | Ms. Parbati Kandel | Bramhasthani UG | -- |
| 10. | Ms. Antari Ghising | Bramhasthani UG | -- |
| 11. | Mr. Krishnaprasad Pande | Bramhasthani UG | -- |
| 12. | Mr. Salikram Pathak | Bufferzone Unit, Piple | Treasurer |
| 13. | Mr. Krishnaprasad Aryal | Kuchkuche UGC | Chairmen |
| 14. | Ms. Dilkumari Bhujel | Kuchkuche UGC | Member |
| 15. | Mr. Ramnath Pathak | Bufferzone Unit, Kathar | -- |
| 16. | Mr. Arjun Chaudhari | Raptiekata UGC | Member |
| 17. | Ms. Pipla Praja | Raptiekata UGC | Member |
| 18. | Mr. Ekraj Pathak | Janashakti UG | -- |
| 19. | Mr. Lekhnath Khanal | Janashakti UG | -- |
| 20. | Ms. Nandakumari Lama | Janashakti UG | -- |
| 21. | Mr. Mangal Chaudhari | Bufferzone Unit, Bhandara | Member |
| 22. | Ms. Harikala Dahit | Devithan UG | -- |
| 23. | Mr. Jiyen Chaudhari | Devithan UGC | Chairmen |