

### **3 Forest management principles for Kon Plong District (Master plan)**

#### **3.1 Background and assumptions**

The Master Plan for forest management in Kon Plong District is required to be in conformity with laws and regulations in Vietnam. With a view to putting wood-oriented products on the international market, the plan is also expected to stand up to evaluation from a standpoint of intensive maintenance of multiple forest functions, conservation of biodiversity and regional conservation of the natural ecosystem by realizing sustainable forest management. In the light of its achievement sustainable forest management is presently discussed at many international forums, along with the criteria and indicators for sustainable forest management, and the trends of international timber certification.

##### **3.1.1 Principles for forest management objectives**

Kon Plong District still has the most abundant natural forest areas in Vietnam. The forest areas in the district are important in view of: i) the viewpoint of biodiversity conservation including inhabitation of large mammals such as tigers, and ii) conservation of the function of watersheds of forests in the locations of the headwaters from a tributary stream of the Mekong River. Therefore, not only Vietnam but other countries take interest in the preservation of the natural forest of the district.

On the other hand, the Central Highlands including Kon Plong District, which has a lot of poor mountainous villages, is backward in economy in Vietnam and so economic development is indispensable to the region for the necessity of people's life improvement, BHN and infrastructure adjustment. Accordingly, the Vietnam government is under the pressure of necessity to aggressively advance agriculture and forestry development leading to industrial activation such as plantation establishment of coffee, rubber and plantation for pulp-use trees. Forests as abundant natural resources are greatly expected to be effectively utilized for economic advancement in the Central Highlands.

A main objective of this master plan is to show principles and guidelines for sustainable forest management and to utilize forest resources without significantly impairing the potentiality for the manifestation of individual expected functions in harmony with such various requests for forests.

##### **3.1.2 Regulations for forest management**

Principles of forest management in Vietnam may remain at conservation of forest environment, and maintenance and restoration of forest resources. Land law shall define forest, and forest law shall classify forest into three groups of production forest, protection forest and special use forest for suitable management according to utilization purposes. Production forest is unified at a certain scale, and the Vietnam government shall allocate regions capable of realizing individual forest management

and operations to forest enterprises (FEs) to assign management responsibility. FEs shall advance individual management within the limit of certain approved matters as an independent enterprise, effectively utilizing the resources according to market economy and maintaining forest conservation.

In regions which are not sufficiently unified on a management scale to be assigned to FE, management responsibility shall be transferred to local government and the People's Committee of each province shall entrust practical works to forest units of districts and communes. Meanwhile, special use forest and protection forest shall have each management committee and be suitably managed under the committee.

Detailed regulation defines concrete methods for forest management and operations including logging and shows a standard to classify afforestation tree species by ecological region, a standard for yielding age according to afforestation purpose and tree species, minimum stock of stands intended for logging, marking size of the stands, yielding rotation, etc. Each FE must make a 5-year management plan in accordance with these standards and be approved by the People's Committee of the Province.

Each organization entrusted with the responsibility of forest management is expected to plant trees in unused wasteland and grassland as soon as possible. To promote the tree planting, Program 327, Decision 661, and the 500 mil. new afforestation program, have been issued and afforestation activity has been being strengthened throughout the country. In addition, mountainous villages are expected to advance such afforestation projects on the fullest scale and each local administrative organization and FEs are required to forward contractual afforestation with mountainous villages. Among local mountainous villages, ethnic minorities in remote areas are defined to be a main target group as beneficiaries of the afforestation activity, and special regard is expected to be paid so as to give benefit through the afforestation activity in such a contract way.

In the light of such a legal frame, the master plan discussed here will review a people support program with a view to realizing benefits for the inhabitants of mountainous villages given by implementation of the project. The trends of forest policy related to laws and regulations for forest management are given in Volume III. 1.

### **3.1.3 Main points of the Central Highlands Forestry Development Program**

Vietnam developed a document related to the conception for the Central Highland Forestry Development Program (1996-2000 & 2010) in 1997. FIPI and FIPI-Quy Nhon Branch prepared a draft of this document and DFD of MARD submitted the document to call on the government for formal examination. The document shows a basic concept for forest development and utilization in four provinces, Kon Tum, Gia Lai, Dak Lac and Lam Don, in the Central Highland areas including Kon Plong District, intended for the master plan, and the needs for forest management objectives in Kon

Plong District can be found.

Under the policy stated here, the following six issues are shown as forest management objectives in the Central Highland area:

- 1) to protect existing forest to conserve watershed, gene resource and bio-diversity, and to improve sustainability of forest products
- 2) to establish concentrated areas for forest plantation
- 3) to establish industrial tree plantation areas and wood processing facilities
- 4) to assist villagers to improve their living standards through encouraging agroforestry, and leading them to stop forest degradation
- 5) to accept transmigration
- 6) to promote social forestry policy.

For the objectives, a plantation of a total of 620,000 ha will be developed in four provinces in the Central Highlands with agro-forestry and new 5 mil. afforestation and the function of natural forest of 180,000 ha will be strengthened with rehabilitation and restoration. Accordingly, the forest cover rate in this region will be raised from 56.7 % of 1996 to 73.4 % in 2010.

To achieve this purpose, the following five measures will be taken:

- 1) to complete legal procedures to settle the forest utilization classification (protection, production and special use) as a lasting boundary
- 2) to identify deforested areas, and make clear rights and duties for implement bodies such as FEs, private companies, individuals, households to carry out plantation activities
- 3) to adjust infrastructure and designate places for industrial plantation
- 4) to renew the wood processing industry
- 5) to evaluate FEs and Protection Forest Management Committee of and special use forest.

This master plan for forest management in Kon Plong District of Kon Tum Province is expected to present a process to achieve the objectives of forestry development in the Central Highlands as described in individual planning matters. Therefore, the following points will be taken into consideration for the investigation.

- 1) multifunction of forests shall be given the first priority
- 2) in this frame above, forest products will be extracted for economic development of Kon Tum province
- 3) economic profit extracted from forest shall be returned in a significant level to the inhabitants of mountainous villages especially ethnic minorities.

## **3.2 Forest compartment**

### **3.2.1 Concept for forest compartment**

Compartmentalization is the most basic concept to administrate operations for forest management. Each group of certain forest stands will be named and places to conduct individual enterprise in the plan will be specified, which will become an index to keep records. Generally, regions intended for the plan will be divided into almost the same area of unit and be numbered consecutively. Compartment will be further divided into sub-compartment by each stands of the same quality, which will be used as the unit for concrete operation planning.

In a direction for setting such groups of stands in Vietnam, units should be called Block, compartment and sub-compartment according to size. In Kon Plong District, 184 units are established from Block 371 to 555 in the system covering the total of Kon Tum Province. As blocks and compartments mean lot numbers to specify rough location of forests on a map, it is desirable for each boundary to be recognized by geographical and natural features without any mistake so as to easily clarify specified places not only on a map but on the ground. Accordingly, the boundaries between blocks or compartments should be fixed by geographical and natural features, which will not be easily moved such as ridges, brooks or public roads.

Blocks are established as a unit of about 1,000 – 1,500 ha in Kon Plong District. As the use of such a basic management unit fundamentally following Vietnam's conventional system is a great convenience from a viewpoint of adjustment with Vietnam's other economic plan and land use plan, planning matters for this master plan shall be studied and integrated using blocks as a unit. However, as it was not possible for the Study team to get an approval to obtain a map drawn on a scale of 1/50,000 showing detailed boundary of blocks owing to Vietnam's various circumstances, a topographical map on GIS was overlaid based on an offered handwritten trace drawing (scale: 1/50,000) and adjusted according to lines of rivers and ridges on the topographical map. Therefore, each area of blocks may have some estrangement from data offered by Vietnam.

Figure I-3.2.1 and Table I-3.2.1 present the relation to block, commune, FE and region bearing their share of the responsibility of forest management with the protection forest management committee.

**Table I-3.2.1 Total area by forest management unit and commune (ha)**

Commune	01PFM Area	02Dak Ring C	03Ngoc Tem C	04Mang But C	05Dak Koi C	06Dak Ruang C	07Con Plong C	08Tan Lap C	09Dak Tre C	10Tan Lap FE	11Mang Canh II FE	12Mang Canh I FE	13Dak Ruang FE	14Mang La FE	15Mang Den FE	Total
01Kon Plong							2,986								2,183	5,169
02Tan Lap								4,263							4,314	8,577
03Dak Ruang						18,148							1,109			19,257
04DaK Tre									11,139							11,139
05Dak Koi					19,381								13,158			32,538
06Dak Pnc															14,896	14,896
07Manh Canh											11,091	16,924				28,015
08Hieu	4,784													15,100		19,884
09Po B	8,740													2,955		11,695
10Mang But		3,798		10,945						13,458	2,803					31,005
11Ngoc Tem	19,945		4,004													23,950
12Dak Ring		19,849								2,665						22,514
Total	33,469	23,647	4,004	10,945	19,381	18,148	2,986	4,263	11,139	16,123	13,894	16,924	14,266	18,055	21,393	228,638

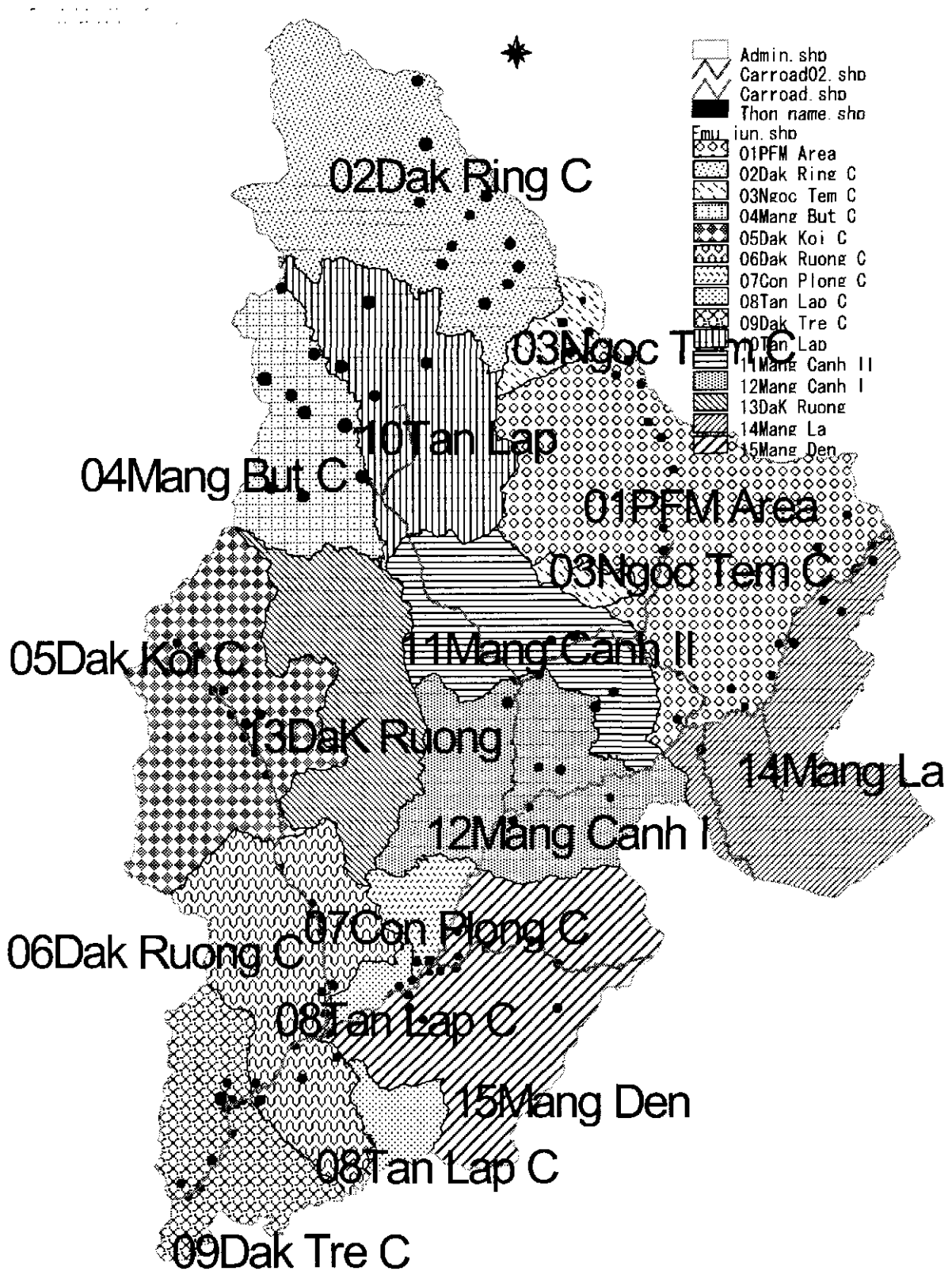


Figure I-3.2.1 Jurisdiction of forest management units (FEs)

### 3.2.2 Determination of protection forest

Forests are first classified into production forest and protection forest. The division is decided by the government on the basis of proposal of the People's Committee in each province and should be unalterable in principle (Prime minister's approval must be required for alteration). Therefore, already-fixed protected areas should be premised to leave kept. Figure I-3.2.2 and Table I-3.2.2 respectively show the location and size of blocks fixed as protection forest area.

Protection forest is defined under the system according to purpose: i) watershed forest, ii) wind and sand movement protection forest, iii) wave and sea encroachment protection forest, iv) ecological environment protection forest. Though which category protection forest in the concerned region is has not been clarified, it can be generally considered that it has an objective of watershed. Block 374 - 496 managed by Protection Forest Management Committee (marked PFM area hereinafter) and Block 500 managed by Mang La FE have the purpose of being an ecological environment in addition to the above objective.

**Table I-3.2.2 Area of production and protection forest by Management unit**

Area	Production Forest	Very crucial Protection forest	Crucial protection forest	Total (ha)
01PFM Area		33,468.72		33,468.72
02Dak Ring Commune	6,668.82	16,978.47		23,647.29
03Ngoc Tem Commune	4,004.37			4,004.37
04Mang But Communc	8,500.22		2,445.17	10,945.39
05Dak Koi Commune	17,528.69		1,852.06	19,380.75
06Dak Ruong Commune	18,148.20			18,148.20
07Con Plong Commune	2,985.63			2,985.63
08Tan Lap Commune	4,263.44			4,263.44
09Dak Tre Commune	11,139.09			11,139.09
10Tan Lap FE	16,123.09			16,123.09
11Mang Canh II FE	11,523.59		2,370.30	13,893.89
12Mang Canh I FE	11,903.20		5,020.53	16,923.73
13Dac Ruong FE	8,828.03		5,438.36	14,266.39
14Mang La FE	12,357.00	5,698.40		18,055.40
15Mang Den FE	20,187.37		1,205.61	21,392.98
<b>Total</b>	<b>154,160.74</b>	<b>56,145.58</b>	<b>18,332.03</b>	<b>228,638.35</b>

Alrcady-defined protected areas include a lot of land remains made arable by the slash-and-burn method, fallow and grassland as well as so-called closed primary forest zone, which will be again explained again in the chapter of land use/vegetation. Especially, there is a remarkable amount of grassland found in the north of Mang La FE (Block 439 and 440), the south of Mang Canh II FE (Block 489, 484 and 485), the center of Dak Koi Commune (Block 453 and 459) and a region leading to Quang Ngai Province in the northeast of PFM area. This means that these protected areas are defined as important regions for watershed conservation.

As grassland in the protected areas first needs to be restored with afforestation, it can be said that priority will be given to allocate national funds to the project for the advancement of afforestation in Decision 327 and 661.

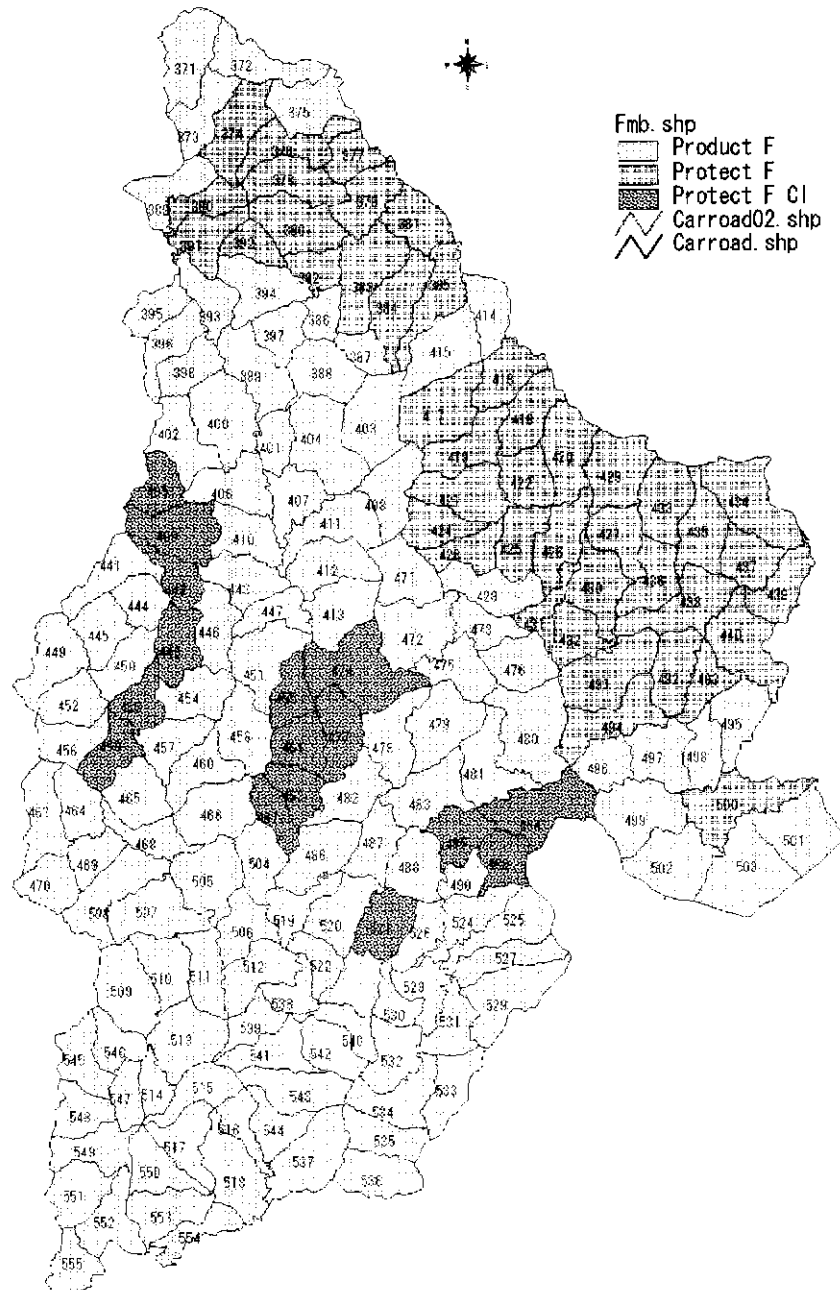


Figure I-3.2.2 Protection area distribution

Protection forest area located in the north-east of the district is the source region of a river flowing into the coast of the South China Sea including Quang Ngai Town. Denudation of this forest will lead to the cause of floods and may bring great damage on economic activities in the coastal region. Flood damage especially on railways or national roads will produce not a little influence on the total economy in Vietnam. However, a considerable amount of area has already been degraded to grassland and bush. With the entry of a lot of villagers, the area has a high risk of forest decrease. This protected



forest has areas of over 50,000 ha and holds the widest area of rich closed stands similar to primary forests. The protected area is indispensable especially to protection and increase of large mammals and the security of the remaining natural forest is also an important interest to this master plan. In the case of carrying on the FE's wood production enterprise adjacent to the protected area, it is important to take consideration to minimize artificial influence on the protected area.

The concerned plan assumes that natural forest of already-secured protected area will be deteriorated or decreased with the uncontrolled entry of people unless measures are taken.

### **3.3 Factors for restrictions on forest operations**

#### **3.3.1 Wildlife conservation**

##### **(1) Wildlife conservation policy**

Vietnam aims for natural resource preservation for the immediate and long-term benefit of people. The Government is paying attention to precious, useful, rare, endangered endemic species preservation in primary forest. There is diverse, abundant typical tropical rain forest fauna and flora in the typical South East Asian monsoon forests. The Government declared its commitment (Decision No 72/TIG, 1962) to nature conservation in 1962, thereafter gazette Cuc Phuong National Park was assigned as a wildlife conservation area also in 1962.

The activities following laws and regulations concerning animal protection and conservation are not sufficiently functional in the Study Area for reasons that local people do not pay much attention to animal conservation and illegal hunters who are still hunting for commercial purposes in the forests. For this reason, it is necessary much more strengthen institutional capacity to implement their roles to control illegal hunting.

Promulgated biodiversity conservation strategy by the government is described in the following two principal documents:

- i) The national conservation strategy (NCS, 1984); National Forest was reviewed and evaluated as Vietnamese Tropical Forest Action Plan (TFAP) No.VIE/88/037 in 1990. The Ministry of Forestry and the Food and Agriculture Organization (FAO) of the United Nations undertook it.
- ii) National Plan for Environment and Sustainable Development (NPESD, 1991). In addition a Biodiversity Action Plan (BAP) for Vietnam, prepared under the auspices of UNDP/GEF project No.VIE/91/G31/A/IG/31. The national authorities (Decision of the Prime Minister No 845/Ttg dated 22 December 1995) have endorsed VIE/91/G31/A/IG/31.

To enhance the above-mentioned principles, 'Promoting Wildlife Protection (No. 551 LN/KL)' was enacted in 1994 for instructing the forestry institutions, Forest Protection Department, customs office, tax services and market management of the provinces. The important points of this instruction are summarized as follows:

- Prohibit in hotels and restaurants to advertise and serve food made from wild animals or their products
- Prohibit producing and selling products made of mammal skin, stuffed specimens and the products of wildlife collected from nature
- Strictly control and seize the illegal trading of wildlife, especially in the domestic market and transfer through frontier, demobilize the center for illegal trade in wildlife
- Severely treat cases of illegal hunting and trading of wildlife and their by-products
- Quickly transfer live specimens which have been confiscated to the zoos at locality or Ho Chi Minh City and Hanoi Zoos, national parks or organize to reintroduce to forests, etc.
- Encourage the institutions and individuals to conduct farming of wildlife for use in domestic market or export.

Following these policy objectives, the plan for forest management needs firstly to maintain the forest ecosystem in good condition for wildlife habitation and propagation. The key problem to protect wildlife is how to control hunting. To protect wild animals is not enough to maintain forest, control hunting and transactions in the animal trade must be controlled within and without Vietnam.

Hunting is very common in all provinces in Vietnam. Within the study area, there are many seasonal hunters among villagers as well as illegal hunters coming from outside areas.

## **(2) Directions and strategies for wildlife conservation**

As mentioned in '2.3 Wild animal distribution', endangered species widely distribute in the Study Area. Although there is a need for a broad area for conservation of large mammals, particularly related to forest, the extent of primary forests is limited in terms of the actual situation in the Study Area. According to the recent survey conducted by WWF, a part of Kon Plong District<sup>2</sup> plays an important role to provide a continuum of habitat and connectivity among Kon Ka Kinh and Kon Cha Rang Nature Reserves in the south, Ngoc Linh and Song Thanh-Dakpring<sup>3</sup> Nature Reserves in the north, and forest areas in Laos (WWF, 2001). Accordingly the study team recommends to secure a significant space for animals' free migration as a bio-corridor that will contribute to extend suitable habitat for

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<sup>2</sup> The survey area covers approx. 65,000 ha including Mang Buk, Dak Rinh, Ngoc Tem, Mang Canh, and Po E Communes.

<sup>3</sup> Song Thanh-Dakpring is still a proposed nature reserve.

large mammals in/around the Study Area.

In establishing the bio-corridor, the following three suggestions that were obtained from experience by the WWF Indochina Program and from real cases of animal protection and translocation programs in India, China and Africa are basically taken into account:

- i) Linkage between protection forests and national parks with a bio-corridor is important for wildlife biodiversity conservation as it would enhance wild animals' survival potential and gene hybridisation.
- ii) Animal migration through the corridor needs no barrier to move, guaranty of life, no risk and perfect security.
- iii) Adequate protection from poachers and illegal hunters is essential. This is a potentially high-risk site for wild animals from illegal hunting.

The best consideration for wildlife and bio-diversity conservation is to exclude the range of an assumed bio-corridor zone from any other wood production forests. The existing natural forest in Kon Plong shall be managed mainly for selective cutting but not clear cutting. Therefore, unless the existing natural forest area is removed owing to slash-and-burn fields, etc., animal transfer in this area will basically not be obstructed much. Bio-corridor assumed here is considered as a place for exchange among animal species on a slightly wider range.

The bio-corridor assumed here focuses on the basic importance for animals as a transfer pathway which connects these sanctuaries. According to the aforesaid WWF survey, riverline forest along the

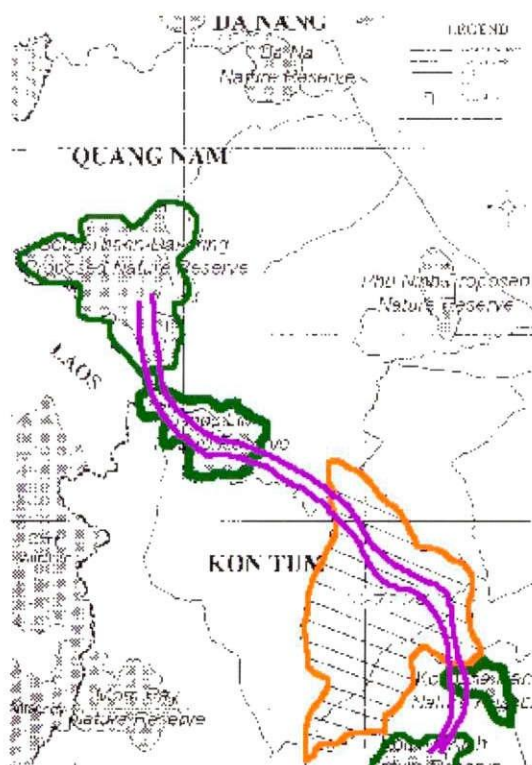


Figure I-3.3.1 Bio-corridor and protect

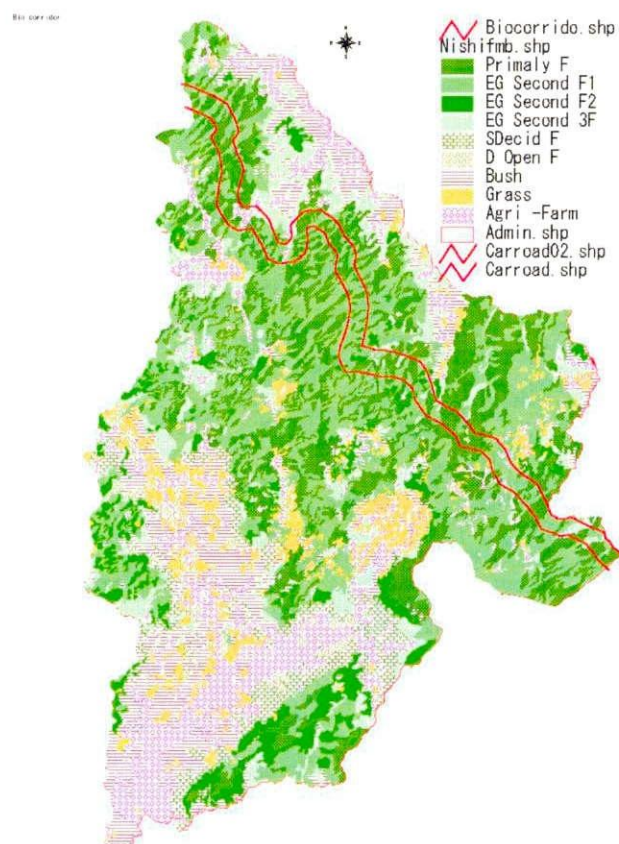


Figure I-3.3.2 Proposed location of bio-corridor

Dak Nghe and Dak So Rivers, and those forests linking Mount Ngoc Boc are recommended as corridors for wildlife conservation (WWF, 2001). In this Study, a bio-corridor connecting between Kon Ka Kinh and Song Thanh-Dakpring is recommended taking account of the areas proposed by WWF and continuum of the said nature reserves (Figure I-3.3.2). The first condition for forest allotted to this corridor is the desire that it be primary forests left in the protection forests. Actually, the most part of it is assumed to pass through protected area. However, all of the protected area does not expand continuously to natural reserve area, and also protected area closed natural forest does not lie continuously. Accordingly, the part which cannot be covered by protected area is inevitable to be excluded from production area. In a possible range, it is considered effective to merge natural forest parts, which are excluded from logging activity area owing to other operative reasons, to the bio-corridor.

### **(3) Control of hunting**

From the viewpoint of wildlife conservation, the Study Area can be divided into three categories as follows based on the degree of protection, and subjects and methods of countermeasures (Figure I-3.3.3):

- i) **Strict wildlife protection area :** The area is established in blocks which surround both sides of the bio-corridor, basically blocks in which the bio-corridor encompasses. Hunting is completely forbidden to ensure the enhancement of wild animal habitation
- ii) **Wildlife rehabilitation area :** The area is set up in blocks that forest coverage rate is more than 50% and that farmlands are not existed in a large unit (not expanded continuously but scattered in small areas). Seasonal hunting is permitted for ethnic communities, but , local people need to protect and monitor the area by themselves
- iii) **Wildlife respect area :** The target area is established in blocks other than the areas i) and ii) above. Preservation of wildlife and tree plantation for conserving the habitat of small animals and birds for feeding or nesting are recommended to local people.

*Strict wildlife protection area* has a rich biodiversity and includes endangered species. Human disturbance should be restricted in order to conserve wildlife in such areas. Within the area, wild animals are provided with a habitat where they can roam and breed. From the viewpoint of the protection of wild animals, the aim of management in this area is to retain the population density. A bio-corridor should be established in the center of the area. The Strict Protection Area is to connect with natural forests in the management area of Dak Ring Commune, Thach Nham Protection Forest, and the bio-corridor and its surrounding area.

It does not make sense to forbid an inevitable amount of hunting in this area, although it is defined as an illegal activity according to law. It is more important to undertake measures against poachers coming from other areas. Local communities should organize patrol teams and cooperate with the local police using radio to prevent poaching completely. Hunting by ethnic groups should also be restricted as far as possible.

In *wildlife rehabilitation area*, the biodiversity is not necessarily rich. The area includes production forests in which forest operation is implemented as well as abandoned slash-and-burn farmlands, degraded forests, bush and grasslands. This category includes two types of forests:

- (a) The production forests and protection forests managed by the six FEs except for forest blocks where bio-corridor is included and Forest Block no. 500
- (b) Secondary forests close to communities which include abandoned slash-and-burn farmlands, such as i) Forest Block no. 416, 418, 420, 423, 434, and 435 in Thach Nham Protection Forest, and ii) Forest Block no. 371, 372, 376, 377, 379, 381, and 385 in Dak Ring Commune.

Although not permitted legally, hunting is conducted on a daily basis. The meat helps ethnic groups in the mountainous area to maintain a livelihood, especially in the case of food shortages. Leisure hunting is not reported in this area but the aim of poaching is mainly to gather materials for Chinese medicines and this seems to affect habitat of rare animal species.

In such circumstances, it is impossible to ban hunting and control poaching completely. Again it is feared that complete ban of hunting may distress rural livelihood. Local people do not usually use firearms, but only simple traps to catch small abundant

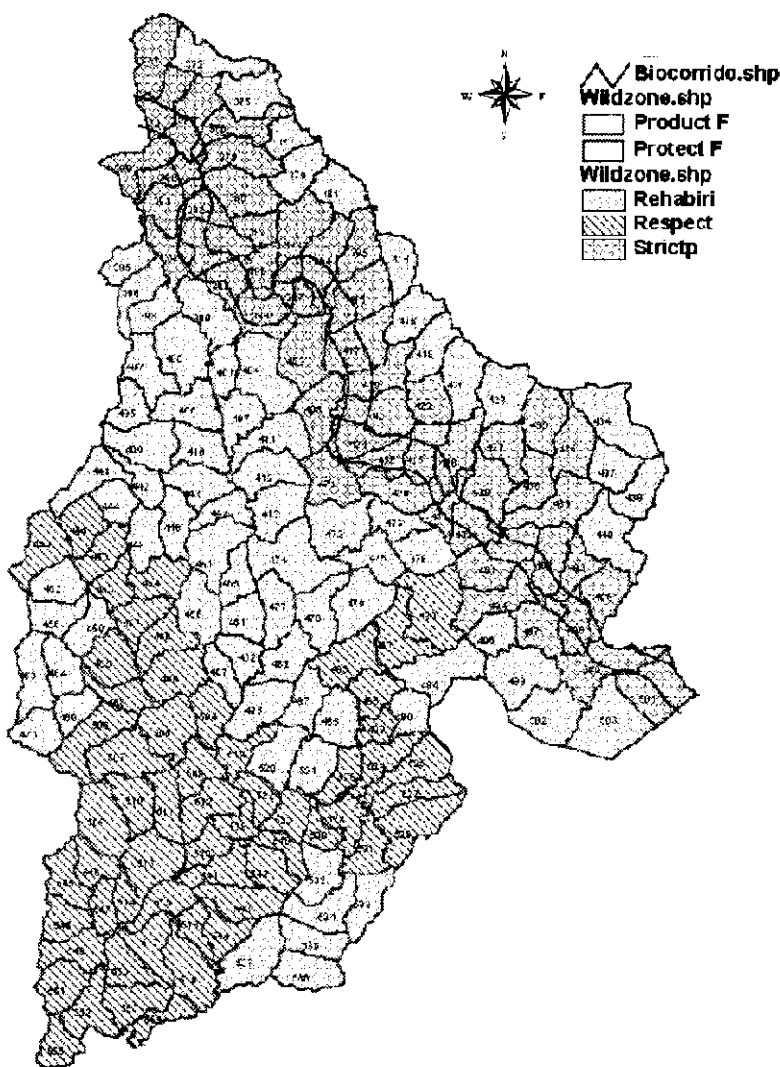


Figure I-3.3.3 Proposed zoning of wildlife protection area

animals. Certain animals are hunted for trade, while others are consumed by local people. For the protection of animals that meet local needs, it is essential to regulate hunting. The forest management administration authorizes hunting by local communities. The target animals, hunting season, the number of animals and area of hunting are to be decided and the administrative authority should also deliver extension and education to local people on maintaining animal populations. It is also important to organize such a hunting control local organization for protection of the hunting areas from outside poachers. The intention in the future will be to guide local people to breed such wild animals for ensuring food without hunting and creating income generation.

*Wildlife respect area* falls in the area excluding the above two categorized areas. This area mainly falls in the agricultural area below 1,000 m in altitude and grassland in Mang Canh Commune where natural forests have been almost depleted or destroyed. The environment here is not suitable for natural habitats of wildlife but some measures need to be taken for the rehabilitation of wildlife, particularly small animals and birds. This area bordered with rich forests provides a buffer zone between such habitats and human communities, and woodlands or bushes in the area provide resting, feeding, or evacuation places for wildlife, especially for birds.

There are two methods of protecting wildlife in such areas. The first is to catch animals safely as they emerge from the forests and return them to their habitat. The second is to maintain patches of trees (bush with a height of 5 to 10 m shrub) in gardens or fields, or along streams where cultivation is inappropriate, or to plant trees to provide food for birds.

#### **(4) Forests for breeding and evacuating place for certain wild animal species**

Although protection forests or bio-corridors are important to secure wildlife conservation, it is not sufficient to enable rare species to maintain or enhance their habitation. Serow, for example, which is an indigenous wild goat inhabiting mountainous slopes in Dak Phe Commune, has been observed in the field survey. This area is under production forest but not special protection area. This case shows that some rare or endangered species live and reproduce in production forests without special protection. For protection of those species, during the planning procedure, even 100 ha of area in which rare species exist should be established for avoiding cutting or postponing cutting until after the breeding period and the area at least 100 m from the breeding places of such animals should not be marked for cutting stand.

It is essential to secure breeding and resting places for wildlife surrounding protected areas. Since a certain amount of evidence of animal habitation was reported along streams and rivers during the field survey, bushes and stands in those areas are significantly useful for animal conservation. As such areas are not suitable for cultivation and not rich in commercial tree species; it does not put a big burden on forest management even if it is excluded from logging operations.

### **3.3.2 Watershed and soil conservation**

Kon Plong District is divided into the southwestern basin of the Dak Bla River leading to the Mekong River and the northeastern basin of the Son Tra Khuc River flowing into the South China Sea via Quang Ngai. The southwestern part is a gathering of small brooks slowly meandering through a gentle range of hills and the eastern part is a deep dale and 30-50 km-long rapid river shooting from 1,300 m down to 200 m above sea level.

Though the two basins are very different in state, both are important riverheads for watershed and soil conservation. The upper stream of the Dak Bla River towards the southwest has little area ratio in the source of the Mekong River, but holds the agricultural area of Kon Tum and Gia Lai Provinces and is a source area for living water, greatly expected to show function on watershed.

Meanwhile, the river flowing to Quang Ngai towards the northeast does not have much basin area but many rapid streams with a big seaside city, national road and railway on the downstream, which means a water source area greatly expected to show flood prevention function to the Son Tra Khuc River flowing down across the arteries of economy.

As stated above, it can be said that the areas intended for this master plan are required to conserve forests to show function on watershed as a whole. Therefore, according to a basic thought to refrain from forest business which may cause a decrease of function on watershed, this master plan aims to i) show an idea to specify areas to restrict timber production using natural forests, ii) evade the concentration of logging operations, distribute and rotate logging sites dispersed into an area size as small as possible, and evade the emergence of a high area rate of logged area on the head of respective primary and secondary rivers, with a view to pay attention so as not to cause a decrease of function on watershed as a whole and improving function on watershed with a plan for further afforestation on grassland.

Considering this district from a standpoint of land conservation, the northeastern protected area is regarded as an especially important area. Outflow of sand from the region will directly lead to a rise of the riverbed and to floods on the coast in the time of typhoons. A number of people have been living in the protected areas (Po E, Ngoc Tem and Dak Ring Communes), and forests have been becoming degraded. Though timber production will not be planned, the protected areas have a wide area of grassland and land made arable by the slash-and-burn method and such devastation needs to be restored.

From the aspect of soil conservation, the southwestern part has gentle hill areas and sand transfer caused by the rapid stream of the river is not big, but tableland-shaped hill areas have complicated small brooks and a surprising number of small steep slopes facing brooks. Small paddy fields, which



are always developed in such small brooks, are important assets to support local people's life. On the other hand, the areas are apt to cause conflict among the villagers concerned in logging operations for timber production. In conducting logging operations, disturbance of forest floor and exposure of topsoil owing to lording of woods and logging operation road are unavoidable, but it is necessary to pay cautious attention to prevent soils from flowing into small brooks. In concrete terms, it is necessary to define logging areas, refrain from activities causing forest floor disturbance for a certain width on slopes facing brooks near paddy fields and preventing soils from moving directly into brooks with tree and forest floor planting; brooks supplying drinking water are similarly treated.

There is no remarkably degraded area other than 483, 485 and 481 grassland and artificial forests in Mang Canh I FE management area. To prevent further expansion of degraded areas, surrounding tree planting is the most effective measure. As afforestation has already started in and around the degraded areas in Mang Canh, it can be considered that there will be little apprehension of rapid expansion of degraded areas. Tree planting in degraded areas themselves is necessary. However, as the areas have not been greatly degraded and soils from the degraded areas have not flowed into paddy fields, natural restoration would be expected.

As mentioned above, function of water conservation should be considered for the determination of management methods for each block and compartment as water conservation by all forests in this area is strongly required. Moreover, conservation of land and soil by the forests is basically the same as the situation of water conservation. However, regarding the methods to identify areas in which logging should be restricted especially for watershed, soil and land conservation, and for water source security of local people, it is mentioned in Volume. I 3.7 (1) and (3) respectively. Therefore, these forests identified are specially considered as significant areas for the functions such as watershed and soil conservation.

### **3.3.3 Forest decrease and degradation**

Forest decrease and degradation occurred in Kon Plong District are analyzed to be derived from: i) shifting cultivation, ii) strong dependency on forests by immigrants which has taken place due to the temporary delay of countermeasures, iii) poverty of local households and encroachment to forests to supplement the low productivity of existing farmlands, iv) over-collection of forest products; e.g. fuelwood, in the boarder between forests and farmlands.

Among the factors above, shifting cultivation and immigrants that are supposed to greatly influence the forest decrease and degradation are further analyzed as follows:



**(1) Assessment of extent of shifting cultivation**

The purpose of this master plan is to adequately manage forests remaining in Kon Plong District and to utilize their associated resources. It is also expected that various activities conducted in forests will contribute to improvements in the livelihood of ethnic minorities dwelling in this area. The forest enterprises and forest services of the communes have responsibility for the forest management. The forest enterprise is expected to make a contribution to maintaining forests and improving living standards of villagers while producing timber. The forest service is expected to maintain forests and support the villagers' way of life.

For the forest managers, the main threat posing a challenge to forest conservation and management is the encroachment on forests by shifting cultivation. The main factors in the rapid decline of Vietnam's forests since 1975 have been the development of agricultural lands by villagers and the development of logging operations by the forest enterprises. This wave of grassland expansion is spreading rapidly into Kon Plong District. Figure I-3.3.4 compares the extent of land deforested by shifting cultivation (grassland) as shown by aerial photographs in 1991 with the extent of grassland revealed by satellite imagery in 2001, and by depicting these data on a GIS map. In order to grasp the characteristics of these changes, Figure I-3.3.5 indicates the extent to which grasslands or secondary forests have been converted from primary forests, and forests or secondary forests have recovered from abandoned shifting cultivation areas. In secondary forests (or degraded forests), forests and grasslands are mixed. Figure I-3.3.6 indicates the changed areas. Table I-3.3.1 indicates increases and decreases in the areas of these forests by commune<sup>4</sup>.

The decline in forest area brought about by shifting cultivation and the development of coffee and rubber plantations during the past decade is estimated to be about 29,000 ha. Meanwhile, the area of naturally recovered land that was once in shifting cultivation and has not been used as arable land for a long time is about 17,000 ha. As a result, the decrease in forests is about 12,000 ha. On average, the annual decline in forest area is more than 1,000 ha.

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<sup>4</sup> The analysis was carried out dividing the area into the following 3 categories between 1991 and 2001: i) abandoned area after shifting cultivation (basically grasslands and bushes, but some areas without forests including paddy and fixed cultivation), ii) forests (area covered with trees including bushes), iii) medium zone (area where forest cover occupies less than 50 % with small patches of shifting cultivation). This trial was conducted to recognize the rough forest decrease in the area but the results include thoughtful bias. However, the data shown in the table are worthwhile as indicators to compare the scale of the decrease in the whole district. Meanwhile, the figure is also helpful to present the approximate area where forest decrease took place. It is advisable to consider that those data contain some extent of limitation for precise analysis.

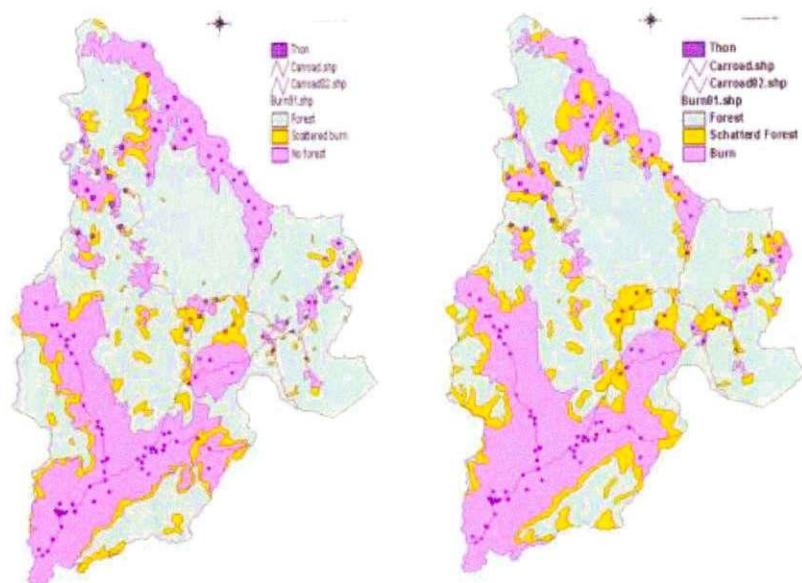


Figure I-3.3.4 Changes in areas of shifting cultivation (comparison between 1991 and 2001)

Notes: Circled areas show where forests were specifically deteriorated

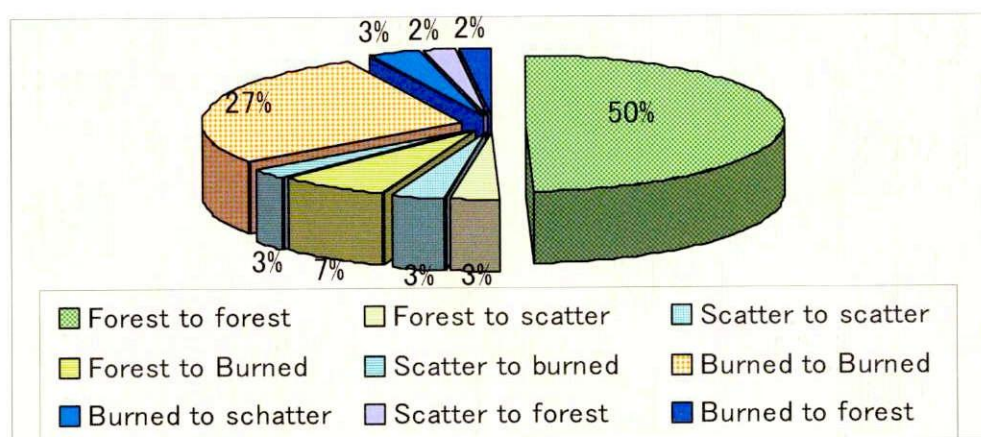


Figure I-3.3.5 Increase and decrease of forests in Kon Plong District

Table I-3.3.1 Increase and decrease of forests by commune in 1991 and 2001 (ha)

Commune	Deforested				Recovered				Balance
	F ->S	F ->B	S ->B	Total	B ->S	B ->F	S ->F	Total	
01Kon Plong	640	480	18	1,138	86	44	84	214	-924
02Tan Lap	815	10	266	1,090	122	0	63	185	-905
03Dak Ruong	1,531	2,147	1,350	5,028	193	65	278	536	-4,492
04Dak Tre	343	210	580	1,132	368	16	160	544	-588
05Dak Koi	1,636	981	560	3,177	1,322	909	620	2,851	-326
06Dak Pne	1,901	235	1,083	3,219	675	239	409	1,322	-1,897
07Manh Canh	2,562	925	278	3,766	717	60	1,132	1,909	-1,857
08Hieu	1,506	413	34	1,952	377	247	270	894	-1,058
09Po E	1,213	372	320	1,905	282	197	489	968	-937
10Mang But	1,515	556	490	2,561	991	939	998	2,928	367
11Ngoc Tem	451	62	0	513	1,091	775	61	1,927	1,414
12Dak Ring	1,654	338	1,172	3,165	1,467	733	217	2,417	-748
Total	15,767	6,729	6,151	28,647	7,690	4,224	4,782	16,695	-11,952

Notes: F, S and B indicate forests, areas where grasslands and forests are mixed, and land deforested by shifting cultivation respectively.

The most substantial decreases have occurred in Dak Ruong, which has lost over 4,000 ha followed by Dak Pnc and Mang Canh Communes, which have each lost about 2,000 ha of forest. About 1,000 ha of forest from Hieu Commune, and about 900 ha from Po E Commune, Tan Lap Commune and Kon Plong Town, have been lost in the last 10 years. There has not been a great decline in forest area in other communes. On the other hand, forests with an area of more than 1,400 ha have recovered in up-country Ngoc Tem Commune.

It is said that the decline in forests (increase in arable land opened up by shifting cultivation) in Kon Plong District was caused by people who took refuge in the hinterland during the war against the United States of America. Although no data is available from before 1975, this view is most likely correct. Most of the lands opened up by shifting cultivation during this period have reverted to secondary forests and are now assessed as forest areas. The realistic view is that most existing grasslands appeared after the war. The decline in forest area over the last ten years is 12,000 ha, which accounts for about 8% of all the existing natural forests in Vietnam including secondary forests (about 160,000 ha). This is only part of Vietnam's total forest area.

As a result of the analysis carried out as a part of this investigation, existing grasslands and bush are estimated to cover 55,600 ha, made up as follows:

- Southern communes such as Dak Koi, Dak Ruong, Dak Tre and Dak Pnc: about 32,000 ha
- Communes including up-country communities with many minority races living in mountains, such as Ngoc Tem, Dak Ring and Mang But: about 14,400 ha
- Communes such as Hieu and Po E, where recent settlers from Ngoc Tem and Mang But in line with government settlement policy established crop fields along national roads: about 1,000 ha
- Mang Canh Commune: 5,200 ha
- Others: about 4,000 ha

As a result, it would be hasty to conclude that the main factor in the recent decline in forests is uncontrolled and haphazard shifting cultivation by ethnic minorities living in mountains. Many forests have declined in southern communes such as Dak Tre, Dak Ruong, Dak Koi and Dak Pnc. In these communes, since arable land near mountain streams was used up for rice paddies, settlers have had to expand their fields up hillsides. The population in this area has generally been increasing. In particular, this increase is closely related to the policy of promoting resettlement in new economic development zones. The increase in the population of mountain communities, and resulting pressure on forests from shifting cultivation, is not necessarily remarkable in forests managed by the FEs.



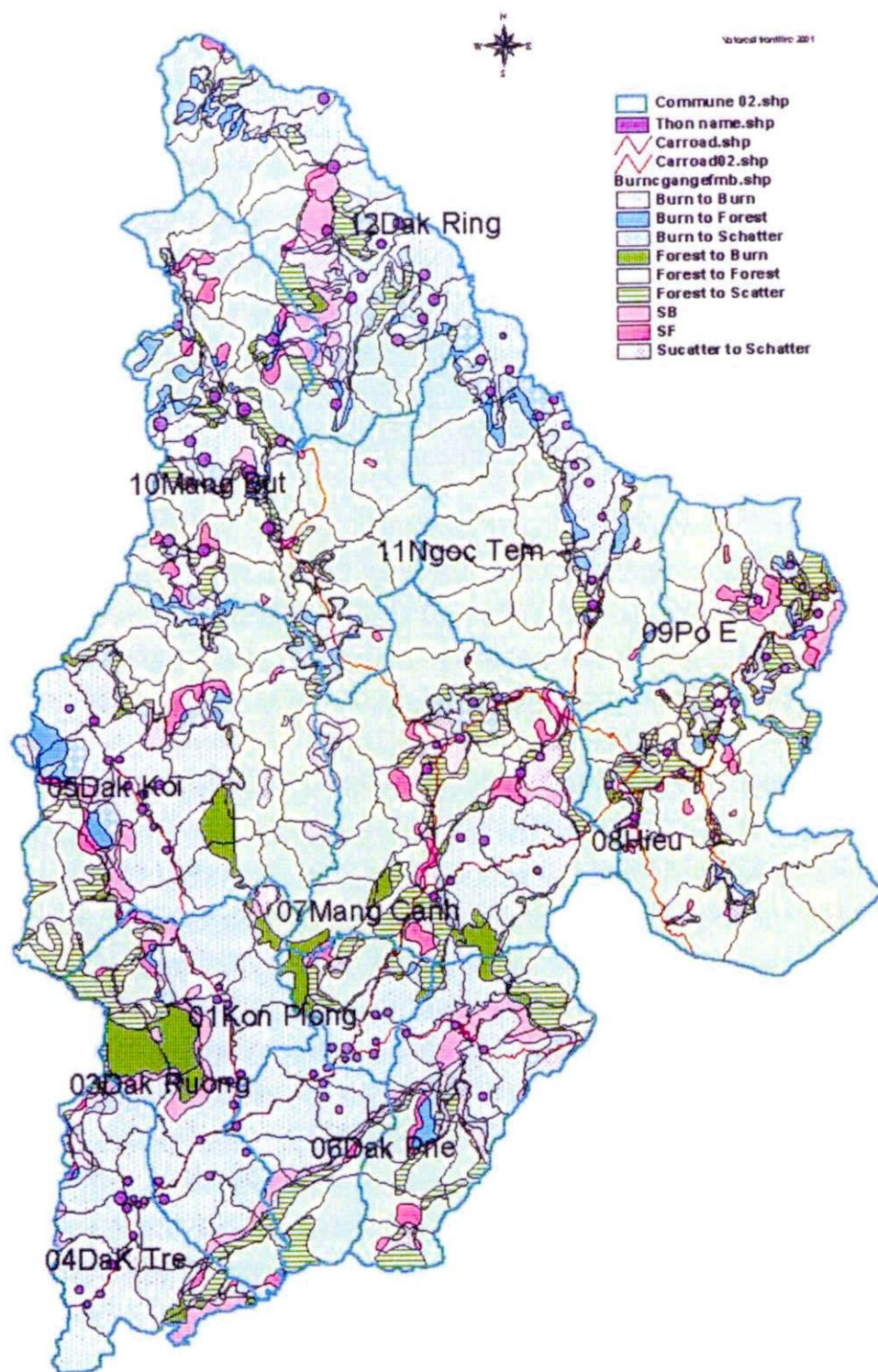


Figure I-3.3.6 Increase and decrease of forests and shifting cultivation in Kon Plong District

Nevertheless, the future advance into forests by new settlers constitutes a threat to sustainable management. In particular, there is a possibility that other settlers who have no relation to the policy mentioned above will expand shifting cultivation activities in the following areas:

- Protected forests in Thach Nham
- Areas along the national road in Mang La FE
- Areas surrounding the projected prefectural road in Dak Ring and Ngoc Tem Communes
- Areas surrounding the prefectural roads in Mang Den FE

A policy of resettlement from remote mountainous areas to areas surrounding national or prefectural roads is being promoted in Kon Plong District. In particular, resettlement from protected forests in Dak Ring and Ngoc Tem Communes to areas along national roads is imperative for the protection of biodiversity and securing bio-corridors in these areas. Therefore, a slight decrease in forests in areas along the roads is unavoidable.

## **(2) Effects of transmigration**

The decline of forests caused by the expansion of shifting cultivation is serious in the south of the study area. Many immigrants have moved into this area in line with the government's transmigration and resettlement policy. In this section, the effects of population pressure on forests due to the transmigration and resettlement policy will be considered.

Kon Tum province has been expected to accept immigrants from the northern area since 1975. In Kon Plong District, the Dak Tan New Economic Zone Transmigration Program (targeting several areas including the current Dak Ruong, Dak Tre and Tan Lap Communes), and the Dak Tre and Dak Ruong New Economic Zone Transmigration and Resettlement Program have been introduced with the intention of achieving at least some results by 2001. Across the whole of Kon Tum Province, 30 transmigration and resettlement programs have been introduced, with the result that about 13,000 families comprising 67,000 people have moved in over the 1996-2000 period. Of these, 1,139 families moved into the Kon Plong District, making a major contribution to the population increase in the area. The statistics do not disclose the precise number of people involved in the transmigration and resettlement programs. The target number of immigrants to be accepted into the New Economic zone of Kon Plong District by 2005 is 16,000 people from 3,170 families, out of which 14,350 people (2,870 families or 77%) are immigrants from other provinces. This shows that a considerable number of immigrants will contribute to the population increase in Kon Plong District, (given that the same percentage of immigrants as in the planning stage, (77%), moves into Kon Plong District in Kon Tum Province, and also assuming that the number of family members per household is also the same, the number of immigrants from other provinces to Kon Plong District is over 4,000 (1,139 families  $\times$  77%  $\times$  (67,000 people/13,000 households) = 4,385 people.) Since demographic statistics before 1993 do not exist, the level of population increase attributable to transmigration could not be tracked with precision. According to the latest statistics by the People's Committee, the population increase in the rural area of Kon Plong (except for Kon Plong Town) during

2000 is approximately 2,300 people (see Table I-3.3.2). It is also reported that in 2002, 750 immigrants are scheduled to move into the area (excerpts from Transmigration survey 2002 JOFCA/National Economic University.) All things considered, it can be concluded that in the last 10 years, the number of new settlements have made a considerable contribution to the increased population in Kon Plong District.

**Table I-3.3.2 Change in population of Kon Plong District**

Year	District total			Remote area			Transmigrates
	Population	Increased population/year	Growth rate (%)	Population	Increased population/year	Growth rate (%)	
1996	28,960						
1997	29,775	815	2.8	26,016			
1998	30,718	943	3.2	26,605	589	2.3	
1999	31,692	974	3.2	27,188	583	2.2	
2000	32,743	1,051	3.3	28,297	1,109	4.1	
96-2000		3,783	3.3		2,281	2.9	?
2002							750

Source: Statistic 2001 Kon Plong PC

Note: The data shown in the table are the latest and different from those in Table I-2.2.4.

Apart from official immigration, the flow of independent immigrants not included in government policy is also significant. During the same period referred to above (1996-2001), 40,168 people outside the official program (7,853 households) migrated to Kon Tum Province. Though it is not known exactly how many families of this total moved into Kon Plong District, based on the assumption that the same proportion of independent immigrants as official immigrants would move in, about 10% (1,139 households / 13,000 households) of all the independent immigrants migrated to Kon Tum Province. In other words, it is estimated that about 3,519 people from 688 families moved into the district. This is obviously an overestimate, because the estimated number of independent immigrants equaling 3,500 people and the number of official immigrants equaling 4,000 people mentioned above, when added together significantly exceeds the actual population increase. However, it is true that the population increase could be caused largely by such external factors as the transmigration and resettlement policy rather than a natural population increase in the ethnic minority who have lived in the area for generations.

Consequently, the locations of immigrant resettlement and whether or not settlement has led to the expansion of slash and burn cultivation need to be checked. To examine these questions, the study team conducted a survey on typical transmigration villages in the Dak Tre and Tan Lap Communes. This survey was based on a sample selected from three different types of villages: those consisting mainly of immigrants, those consisting of relatively fewer immigrants, and those consisting of roughly equal proportions of immigrants and original inhabitants. It

investigated the question of whether or not the population increase due to the resettlement has increased the pressure on the surrounding forests. The detailed results of the survey are shown in Volume III. 10 “Report on Transmigration Survey”.

Many of the existing villages along Route 24 consist of people who migrated in the late 1990s. Though the transmigration policy actually started in 1993, many people moved into the villages between 1994 and 1996. This transmigration period, therefore, coincides with the decline in the forest area mentioned above. Initially, there was a plan to provide each immigrant household with housing, 1,000 m<sup>2</sup> of land for the housing and a backyard garden, and 0.5 ha of arable land. However, because the land, especially the arable land, was provided too late for the newcomers, they had to earn their living by selling logs that came from the surrounding forests. The situation and logging practices were similar for the resettlement areas. Additionally, charcoal burning became common due to the social background mentioned above (there were over 70 charcoal burner’s kilns distributed among the 3 communes around 1996), as a result, a considerable area of the forests was cut. Moreover, at first, unregulated land development and disputes over the land often occurred between immigrants, and the new villages didn’t function normally as a community. This seems to be because many of the immigrants came from different villages in Ha Nam Ninh Province in the north, meaning that the customs and values differed from those of the original inhabitants.

It is true that the lack of organization in the early stages had some impact on the decline in the forest area. However, based on the analysis of the present situation in the resettled villages, there is no evidence that immigrants (mainly Kinh People) carried out deforestation to expand the area for shifting cultivation. This is because i) the Kinh People had little knowledge and experience about shifting cultivation though they had experience about rice and field cropping, and ii) they resettled near the current national roads, far away from the remaining forests. Therefore, it is assumed that for an interim period they utilized the forests for gathering logs, but were hardly involved in carrying out continuous shifting cultivation. After that, the District Government took countermeasures such as building up the road infrastructure, improving the distribution of the land use rights, and distributing food to those immigrants who were starving. As a result, the immigrants have been able to start living stable lives though they are by no means affluent.

The objective of this survey is not to find the direct cause for the decrease in forests in the Dak Ruong and Dak Pnc Communes and others. Those who have lived in this area since 1975 are the Ba Na and Xc Dang people, who have traditionally carried out shifting cultivation. They have resettled in a more convenient area near the national roads in line with the government transmigration and resettlement policy, and have developed the agricultural lands. However, irrespective of the current law, their right to use the land for shifting cultivation, which they held

formerly, has not actually lapsed. Naturally, they attempt to use their former land for shifting cultivation. The result, however, is that many areas planned for cultivation are burnt, as they seem to have less control over fire than was the case in the past.

There are several reasons for the decrease in forests as mentioned above: immigrants' traditional lifestyle; temporary dependence on forests due to transmigration and resettlement; a lack of suitable agriculture land in new villages; damage to crops caused by climate changes such as drought and aridity, and others. These factors have intricately intertwined with each other to increase dependence on forests, which has led to forest deterioration. Moreover, dwellers have been permitted to use the deteriorated forestlands as crop fields (shifting cultivation in closed, good quality forests might be prohibited, but in general, developing secondary forests and bush may be readily used if the land is deemed acceptable by the villagers.) In conclusion, all these things have caused the decline in forest area.

While the decline in the forest area is serious in the southern area, caused indirectly by a population increase or an influx of people due to transmigration and resettlement, the decline has not been so pronounced in the northern forest area managed by FE. Although the transmigration and resettlement policy can be said to be the main reason for the decrease in forests, the future advance into forests by new settlers constitutes a threat to sustainable management. In the 25 years since the end of the war with the US, the children of baby boomers are now becoming independent of their parents (in both urban and remote areas) and are seeking to establish households in the new lands. The fact that they need new agriculture land means there is a strong possibility that there may be further decreases in forest areas. This pressure on forests may lead to the development of agricultural lands by villagers and independent immigrants. In particular, there is a possibility that other settlers who have no relation to the policy mentioned above will expand shifting cultivation activities in the following areas: protected forests in Thach Nham, areas along the national road in Mang La FE, areas surrounding the projected provincial road in Dak Ring and Ngoc Tem Communes, and areas surrounding the provincial roads in Mang Den FE. A policy of resettlement from remote mountainous areas to areas surrounding national or provincial roads is being promoted in Kon Plong District.

### **(3) Forest encroachment for supplement poverty and low productivity**

Although it was difficult to sufficiently analyze through satellite imagery, to some extent, it is presumed that a significant area has been deforested for small-scale plantations of coffee, pepper, boi loi and rubber in the area below 1,000 m of the Study Area. These farmlands are chiefly owned by local farmers but some are owned by residents of Kon Plong Town or Kon Tum Town (local people are employed to manage the farmlands). In the background of this



situation, it is envisaged that areas for paddy and shifting cultivation are limited, and the local people suffer from food shortage and poverty. However, some farmlands are managed as for investment by relatively wealthy local people or residents in other areas, thus it is difficult to generalize the situation.

#### **(4) Utilization of forest products**

Regarding utilization of forest products by local people, by household in the Model Area, 1,430 m<sup>3</sup> of round logs (including poles, etc.) (2.2 m<sup>3</sup> per household) and 5,093 m<sup>3</sup> of fuelwood<sup>5</sup> [0.15 m<sup>3</sup> (75 kg)/household x 52 weeks x 653 households] were used in communes of Hieu and Po E last year as mentioned later (3.2.3 (3), Volume II). On the other hand, as a whole in the district (the Study Area), annual timber production is 625 m<sup>3</sup> and round log production is about 2,100 m<sup>3</sup> considering the recovery rate of 30 % as described in 2.5.1 (1)<sup>6</sup>, Volume I. With fuelwood, the consumption is 46,667steres or 32,667 m<sup>3</sup>.

Therefore, if the figure of 2.2 m<sup>3</sup> of round log volume in 2 communes is applied for the whole district, the total volume would be 14,117 m<sup>3</sup> (2.2 m<sup>3</sup> x 6,417 households). For reference, if the figure of 0.15 m<sup>3</sup> of fuelwood consumption in 2 communes is applied for the district, the total volume would be 50,053 m<sup>3</sup> (0.15 m<sup>3</sup> /household x 52 weeks x 6,417 households) and the figure become 53 % higher than the data of 32,667 m<sup>3</sup> mentioned earlier.

Moreover, focusing on only fuelwood, as 50 % more of the amount is being used in the 2 communes of Hieu and Po E compared with the average of the whole district, it is supposed that forest resources are rather abundant in the 2 communes. Conversely, in the area below 1,000 m of the southern region of the district, it is assumed that the fuelwood collection is giving relatively strong negative impacts to natural vegetation in consideration of high ratio of forest decrease and degradation and high population density. Furthermore, considering the above situation, in the 3 communes of Dak Ruong, Dak Tre and Tan Lap where the transmigration program was promoted, utilization of forest resources has accelerated the forest decrease and degradation as well as increase in shifting cultivation derived from the population increase.

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<sup>5</sup> including dead and damaged trees

<sup>6</sup> Since 2,100 m<sup>3</sup> is the round log volume for timber production but does not include volume for poles used for fences, it can not be compared with the total volume of 1,430 m<sup>3</sup> in two communes of Hieu and Po E.