

3. 開発調査業務の方向づけと概要

以下に本調査実施にあたっての各分野の現状と、調査が与える影響や、調査時の留意点等を述べる。

3-1. 社会経済調査

3-1-1. 林業をとりまく社会経済状況

調査対象地域も含むアンデス地域の土地生産性は低く、地形の複雑なこともあり、森林は現在まで農地転換が余り進まず比較的良好に保存されてきたが、それでも天然林の現状を見ると大径木が資源的に少なくなり、現在の森林資源は弱令二次林、択伐後低質林、老齡過熟林がほとんどとなっている。

これらの森林は薪炭として利用される他は、その経済性があまりなかったが、ここ数年の広葉樹チップによる大きなマーケット形成により地域の南極ブナ天然林、二次林を取り巻く経済的環境は一変し、これら低質天然林にも市場性と流通性が与えられるようになってきており、またこの集荷量が大きく中小の山林所有者でも市場に参加できるようになった点この地域での天然木を利用した伝統的な製材業に代わる地場産業の育成に大きな可能性が生れてきているともいえる。

しかし現在調査対象地域周辺の中小山林所有者は一般に山間の狭い平地での零細な耕作、山地への粗放な牧畜などによる自給的な農業を基盤として生活しており、生活に余裕もないため、森林の育成・経営に長期的・恒続的展望を持ちにくく、現在の過熟したチップ需要に無計画に対応しさらに山を荒らしてしまう等も考えられる。

近年の変化はあまりに急激すぎたため、過伐・乱伐などの多くの弊害も指摘されだし、自然保護団体や国民の多くが危惧するところとなっているが、今のところこの種の森林に対してどのような経営目標を立てどの程度まで利用して良いものか明確な管理指標がないのが現状である。

政府も森林管理のシステムそのものを見直し、変革をはかる必要性を感じており、低質天然林の間伐や整理伐によって生産される素材にも経済性が付与されるようになったことを利用し、これら対象地域周辺の林業を天然林樹種主体による育成林業に転換しようとする政策を打ち出している。そして、これに対する助成策や森林法改正を検討中であるが、人工林造成においてはラジアータマツの歴史が長く、林産業の大半がこの資源を中心に形成されてきており、今のところ安定した市場性、経済性を持っているため一般には多くの山林経営者がいまだこの樹種を植栽しているのが現状で、対象地域周辺でも弱令二次林が皆伐されこの樹種が植栽されてきている（チップ市場によって形成された利益が、樹種転換のための造林費用として使われているわけである）。

このような社会状況において出されたチリ側の要請による、第8・9州地域における

天然林資源の調査とその管理計画の策定は現在のチップ市場の動向とそれに対する国民の関心の高まりを考えると、非常に時宜を得たものである。また、

- ① 国が重要輸出品として政策的にも重点を置きかつ地域の基幹産業となっている林業・林産業の拡大とともに現在ラジアータマツ資源主体であったこの分野の多様化にもつながること、
- ② 地域でもっとも低所得層の多いアンデス山間部での零細農民・季節労働者などの地域住民のより安定した雇用機会の増大、所得の向上に対する効果を持つとともに現在このような小規模土地所有者が行っている山地に対する放牧などの不適切な土地利用を指導し、副次的には雇用収入の増加により自らの所有地に対する過度の森林・放牧利用を緩和するなどの効果も期待できること、
- ③ 現在過熱化しているチップ市場の拡大により今後起こりえる乱伐に対してより土地保全的で資源保続的なレギュレーションが提示できること、
- ④ 企業林などに対して国の林業政策に照らしてより適切な経営目標や樹種を選定させるインセンティブになりえること、
- ⑤ 自然保護団体や国民の多くが危惧するところとなっている天然林資源の利用問題に対し一つの解答を提示できる点でその成果は周辺地域の社会経済状況にとって極めて有意義なものとなり得ると判断できる、
- ⑥ また、調査後適切な計画が提示され十分な技術移転が行われるなら、その成果は当該地域にのみとどまるものでなく同様の問題を顕在化させている10州以南に残る全国の50%以上をしめる天然林地域に大きな影響力を持つモデルと成りえること、
- ⑦ 今後の国家林業政策、特に1994年に予測される森林法改正に対して情報を提供しその転換および多様化の要となっていく可能性も考えられること、
などその波及効果にも大きなものがある。

3-1-2. 本格調査上の留意点

- 1) 今回の調査対象地には民有林が多く含まれているので所有者や管理者に許可を取るなどの基本的配慮はもちろんであるが、国民の中には日本企業の大規模な木材利用に対して神経質になっており反発などがあることも事実なので、誤解を招かないようあらかじめ対象地区住民に対して調査結果の使用目的などについて明確な説明と了解を取っておくことが肝要であろう。
- 2) 自然・環境保護団体の存在もあり国民全般から強く天然林の適正な開発が望まれている状況であるが、チリ政府側の要請に沿って天然林樹種主体の適正で恒続性をもつ利用・管理及び育成を目的としての管理計画を策定するかぎりにおいて、自然保護団体をはじめとした国民感情との間で大きな摩擦が起こる可能性は少ないと考えられる。

3) 地域には所有面積の小さい自給的民有林と企業的經營が可能な大面積民有林が混在し、それぞれ經營規模の違いによって所有者の意向と利用目的が明確に異なると思われるので、この点を調査し、森林計画を立てる段階で区分を明確にする必要があると思われる。

4) もともと林業經營を目的とした企業林等、所有規模の大きい民有林の管理は現状でも良好であるとのことであるし、今後もその管理指導上で大きな問題が生じるとは思われないが、天然林樹種の育成はあまり知られておらず、またユーカリと比較してもパルプ材として価格的に有利とは言い難く、現在政府が打ち出しているような、天然林育成主体の經營を一般の山林經營者に普及させるためには、経済性に裏打ちされた計画であるか、あるいはそれ以外でのインセンティブが必要であると思われる。したがって、管理計画により設定されるその經營方針が（例えば家具・高級材育成を狙った長伐期經營）経済的にも妥当性を持つものなのか、そうでなければどのような利点があるのか、環境保護などの点から明確な論拠が報告書において提示されるべきである。またどのような法制度・インセンティブが必要であるか示されるならより望ましいであろう。そのためには実際に現在彼らがどのような經營をし、どのような經營方針を持っているかアンケートなどにより調査することもその参考になろう。

5) 小規模森林所有者の場合に問題なのは森林管理能力の低さで、一般に森林管理の問題は企業の大所有地よりもこれらの土地で多く指摘されている。CONAFの管理能力も実際にはこのような小規模民有林の管理にまでは十分目が行かず、それを過大に評価するわけには行かないので、目標とする管理計画が実行されるためにはそれが小規模所有者に対しても実行可能であるのか、それを受入れることができるほどの妥当性を持たせることができるかに掛かっていると思われ、本格調査では管理計画においてこの小規模民有林の取り扱いをどうするかを判断する材料を提供することも配慮し、統計に表われにくい周辺住民の生活や農牧林業の実態、天然林利用・管理に対する意向をアンケートやその他の方法により十分調査・把握する必要がある。

6) 生活を安定させるためには住民にとってその林業が永続的で高収益なものでなければならず、適確な管理指導が必要なことは明らかであるが、注意を要するのは自らの食を得ることに汲汲として現行の土地利用に自転車操業的な様相があることであり、山林資産の長期的管理計画を実行させることは実際問題としてかなり難しいものがあるであろう。

また彼らは現在、農業や放牧に頼って生きている性格上、林業だけを主体とした計画を押し付けるだけでは小規模所有者には実行されない可能性が強いので、森林区分の中に現在の放牧地周辺をより保全的な混牧林業で巻き込む中間的なステージを設けることが現時点ではより受け入れられやすいと思われるので、この点が検討されるべきである。

う。いずれにしろ彼らの土地利用、天然林の活用についての意向および管理能力について十分なアンケート調査等を管理計画策定にあたって実施することが肝要であろう。

- 7) 今回、原住民（マプーチェ等）の現状を調査する機会は持てなかったため今後の調査にどのような影響があるか予測できないが、調査対象地域内にマプーチェの人々の居住地が点在している事実は一応念頭に置き、必要とあれば彼らのもつ歴史的特殊性（抑圧を受けてきた民であり、植民者に対する不信感も根強いと言われる）を考慮して、調査計画策定を行う必要があるだろう。

3-2. 森林航測

3-2-1. 空中写真撮影の実績

チリ共和国における地図類は、INSTITUTO GEOGRAFICO MILITAR(軍地理局、以下I.G.M.)の販売カタログによれば、小縮尺のものについては、1/500,000 図および 1/250,000図がほとんど全域をカバーしている。

大縮尺のものについてみると、アンデス山系を含めかなりの部分の地域については1/50,000図が作成されており、南部地域の人家のまれな地域あるいは土地利用の活発でない地域についても1/100,000図によってカバーされている。さらに、都市地域やその周辺部、あるいは平野部、海岸部については、海岸山脈地帯も含めて1/25,000図が作製されている。

これらの地図類は I.G.M. が販売している。しかし、カタログ上では整備されていても、品切れ状態でオリジナルの入手が難しく、フォトコピーを購入することが可能ということも多いとのことである。今回の調査においても、調査対象地域の一部についての地形図が在庫品なしでオリジナルが入手できず、INFOR所有のものフォトコピーを入手するのみに終わるということを実際に経験した。なお、空中写真の標定図も I.G.M. のサービス窓口(サンチャゴ市内にある、日本でいえば「日本地図センター」)で閲覧可能であった。

図3-2-1 に、第8州、第9州の1/25,000及び1/50,000地形図についての一覧図を示す。

3-2-2. 空中写真の利用状況

調査対象区域を撮影した既存の空中写真があるが、縮尺は1/50,000であり、樹種判読、林相区分のためにはより大縮尺の空中写真が必要である。しかし、比較的新しく撮影されたものなので、事前の写真による計画・概査、土地利用区分などに利用できよう。

空中写真の利用は定性的な面からの判読・利用が主に行われており、過去にも植生調査等に際して用いられたとのことである。INFORで空中写真判読を行える者は、4~5名ということであり、判読用機材としては、実体鏡及び双視実体鏡(アメリカ製)各2台とポケット実体鏡が多数整備されている。また、空中写真利用による材積推定等については、誤差が大きいので利用していないということであった。現在、森林管理への空中写真の利用としては、縮尺1/50,000地形図を作成して利用していること、モザイク写真の利用がなされていること、過去に作成した植生図を利用しているなどであり、定性的利用ということもあってオルソフォト(正射投影写真)にも興味を持っているとのことであった。

I.G.M.の販売カタログには、空中写真の他、空中写真の成果品であるオルソフォトも含まれている。オルソフォトは、定性的・平面的に地上の事物の配置を表現しており、それ

を利用するという性格上、全域をカバーすることはないが、第8州については200シーン、第9州については154シーン作製されている。1シーンはおおよそ6'30"×7'30"の区域をカバーしている。

チリ共和国において作製されているオルソフォトの縮尺は、一部を除き、ほとんどが1/20,000で、2kmの方形に区切る線が引かれている（ただし、カタログに示されている見本のオリジナルの空中写真の縮尺は1/60,000との記載があった）。

図3-2-2に、オルソフォトの作製区域を示す。

チリで、これまでに資源評価の試みのためマップ化されたものは、1968年撮影の空中写真を用いたもので、現在もこれらの成果品が利用されている。植生図についても撮影時がかなり以前の縮尺の空中写真を用いて作成されたものが利用されているため、現状と合致しない部分が増えてきている。また、新規に作成するものについては、これまで12群に分類したものをふまえ、より細分類したものを利用できるように出来たら、という希望がある。なお、森林資源管理に用いることを考えたとき、現在使われている図面には、材積に関する数字が記載されていない、優占樹種についての樹種占有割合が不明であること、などが不満を感じる点である。

3-2-3. 空中写真の撮影

空中写真の撮影は民間の航測会社（SAGALI社のみ）および軍の航空写真局（SAF）のいずれでも可能である。

まず、撮影機材の装備面からみると、SAFの装備が格段に優れている。

民間の航測会社（SAGAL:SERVICIO AEROFOTOGRAFICO de GAVARDO LTDA.）

所有航空機 : Piper Navajo PA-31 のみ。

カメラ : Wild RC-10 レンズ f:151.65mm のみ。

撮影実績 : 1982~90まで53件（縮尺は小面積大縮尺 200ha弱~ 1/2,000から数十万ha~ 1/30,000 といったものまで）。

軍の航空写真局（SAF:SERVICIO AEROFOTOGRAFICO）

所有航空機 : リアージェット1機

他に2種、2機所有

カメラ : Wild RC-10 シリーズ

（レンズ f:88, 153, 210, 300mmの4種）

民間会社の撮影も、かなりの撮影実績を持っておりI.G.M.やFAO、あるいは民間の会社所有の山林の撮影を実施するなどしている。その成果品の一部を直接手に取って見た印象からは、SAF撮影のものと比較しても特に遜色もなく、不都合な点も特に見られなかった。ただ、航空機、カメラなどの撮影機材および撮影士、操縦士を含め1セットであ

るという点が、撮影スケジュールが重要視されるこの種のプロジェクトでのこれまでの実施例での問題点を考えるとき、気になるところである。

INFORの測定部門の関係者の総合的判断は、SAFによる撮影の方が断然よいという評価で、ぜひSAFに撮影させたいという意向であった。これは上記の複数の撮影チーム体制が取れることや、SAFの装備が優れていること、SAFでは各種の空中写真判読を行い、成果品を印刷物として公刊・公表していること等も評価に影響しているものと考えられた。

3-2-4. 撮影区域の決定

調査対象区域の選理由は前述の通りであり、北及び南のモデル地区は流域を単位とした地域であるが、これら南北2カ所約64,000haのモデル地区を含む空中写真撮影区域をおよその緯度と軽度で表すことにする。

撮影区域は、第8州ビオビオ州南部州境から第9州アラウカニア州にわたる、アンデス山脈の西方に位置し、南北に長い地域で、

| 南緯 | 西経 | 南緯 | 西経 |
|---------|---------|---------|---------|
| 37° 55' | 72° 00' | 39° 05' | 71° 35' |

の各地点を結ぶ線で囲まれた、おおよそ550,000ha(東西約36km、南北約130kmの南北に長い地域で、安全を見込んで東西南北に各々2.5kmを加えたもの)について撮影するものとする。

(図3-2-3の矩形域が全体で、この区域内に尾根を境界とした流域単位で選定した北、南のモデル地域を含む)。

3-2-5. 撮影縮尺

この空中写真撮影は、森林判読と森林管理計画立案のための各種図面作製を目的として行われるものである。こうした目的のための森林基本図、林相図をはじめとする森林管理のための図面としては縮尺1/20,000が適当である。日本においても空中写真を利用して森林調査のための各種図面を作製する場合の写真の撮影縮尺としては、1/16,000~1/20,000の縮尺が多く採用されており、精度とコストのバランスからも1/20,000の縮尺が適当である。

3-2-6. 作製図面等の種類

森林計画のための基礎資料として、天然林を主体とする北モデル地区約38,000ha、造林地、山火事跡地、牧草地および天然二次林などさまざまなタイプの利用形態が存在する開発の進んだ南モデル地区約26,000haの2カ所、合わせて約64,000haについて次の各図面を

作製することとする。

- ① 森林基本図 (縮尺1/20,000 1式)
- ② 土地利用及び植生図 (縮尺1/20,000 1式)
- ③ 林相図 (縮尺1/20,000 1式)
- ④ 森林管理計画図 (縮尺1/20,000 1式)

また、おおよそ 550,000haの空中写真撮影区域についての成果品としては、当然のことながら、

- ① 空中写真撮影ネガフィルム (縮尺1/20,000 1式)
- ② 同 密着写真 (縮尺1/20,000 1式)
- ③ 標定図(航跡図) (縮尺1/20,000 1式)

が作製されることとなる。

林相図は、空中写真判読を主とし現地調査の成果を活用してによって林相タイプの区分を行い、また、土地利用及び植生図も空中写真判読と現地調査の併用によって図示するものとする。現地調査地点の選定にあたっては、空中写真判読による層化とサンプリングとの組合せを用いることが、理論性を完全に満足できなくても、実用性の高い手段を採用することとなり、効率的・实际的であり、妥当と考えられる。なお、現地調査の適期はおおよそ11～3月である。

3-2-7. 図化のための水準点の有無

I.G.M.の情報によれば、南緯 $38^{\circ} 00'$ ～ $39^{\circ} 05'$ 、西経 $71^{\circ} 30'$ ～ $72^{\circ} 00'$ の範囲内に、地図作成のためのコントロール用として、水準点が21ポイント配置されている。これらは、2等水準点で、座標系としては U.T.M. 座標系がもちいられ、海拔高で示されている。

3-2-8. 撮影の委託契約

撮影経費についてSAGAL及びSAFに対し見積書の提示を求めたところ、SAGALからは資料3-2-4のとおり、経費見積が会社概要も含むプロポーザルと合わせて提出され、SAFからは資料3-2-5のとおり見積が提出された。

(SAGALの見積内容)

約21ルート of 撮影 (1050枚)

550,00ha

税 (I.V.A : 16%) 込みで 47,096 US\$ (約 750万円)

成果品は、プリント 1 Set、ポジフィルム 1 Set

(SAFの見積内容)

白黒(プラスX)による縮尺 1/20,000 の 550,000haの空撮 (1,423 枚)

税 (IVA:16%) 込みで 17,933,600ペソ (約 950万円)

成果品はプリント 1 Set、ポジフィルム 1 Set、標定図 1 部

(ただし、その後の連絡により、ポジフィルムはネガフィルムとしても持ち出せ、また見積額も同じであることの確認を得ている。)

期間は40日間、撮影適期は、11~3月(5~8月は不適)

支払方法は前払金30%、の2度払い

※ SAFの場合、資料3-2-6のように1回目の見積では若干高額であったことから、再度取り直した結果上記のような見積内容となった。

以上を見積を比較してみると、撮影枚数の違いを補正すれば、SAFの方が価格面においても若干優れている。他の南米諸国での実施例と比較すると撮影単価は低いのではないかとと思われる。

また、SAGALよりもSAFの方が撮影実績もあり装備機材も優れていることから、INFORはSAFの撮影を希望しており、撮影の再委託については特に問題がないと考えられる。

その他、SAFが販売している空中写真で対象地域全域をカバーできる縮尺5万分の1の写真の見積もとったところ、必要枚数は約180枚で、総額500 US\$で購入できる。

3-2-9. 撮影の適期

これまでに調査対象区域を含むかなりの広域にわたる撮影が、1/50,000という縮尺で既に実行されており、このような本計画よりも小縮尺の撮影が行われていることからみても、撮影のための天候の好条件が得られる確率は高いものと期待できる。撮影の適期としては当地域の乾期に当たる11月~1月頃が想定される。2月になると畑を焼くため煙がたちこめ撮影条件が悪化するのでそれ以前に済ませることが望ましい。

3-2-10 撮影方法

撮影は南北コースとする。約550,000haの撮影には少なくとも延べ10日程度を要するものと考えられ、前述のとおり撮影のための好天の得られる確率は高いものと考えられるが、天候次第によっては大幅に増える可能性を含んでいる。

使用するレンズは、対象地域が山岳地帯を含むことから、その高低差を考慮すると、極端な短焦点のレンズは避ける方が望ましい。

例えば、焦点距離150mm、写角93°画枠23cm×23cmの広角レンズ(あるいは、焦点距離210mm、写角75°画枠23cmの新普通角レンズ)を使用すると、縮尺1/20,000の写真を

コース方向60%、コース間30%の重複率で撮影するとすれば、対地高度は 3,000m (4,200m)、撮影間隔(1,840m)、コース間隔 3,220m(3,220m) となり、安全率(1.3倍)を見込んだ撮影枚数は 930×1.3 約 1,200枚強となる。撮影基地としてはテムコ空港が撮影区域の中心まで70km程度の近いところに位置しており、設備面からみても適当と考えられる。

3-2-11. その他

写真の国外持ち出しについては、ネガ、ポジフィルム及びプリントの持ち出しについては問題ないとのことである。

チリ側としては、このプロジェクトについて、結果あるいは成果を一括提示してもらうことも必要であるが、成果品の提示に至るまで解析手法、ソフトウェアなどを理解し、自分達で普及活動が行える技術の獲得を最終目標としたい、との強い意向を示し、技術移転セミナーについても重要視している。こうした趣旨から、空中写真判読等についても可能な限り解析作業等にもかかわり合いたいし、成果品にいたる作業に用いた写真(判読結果を書き込んだもの)等も入手したいとの希望を示している。

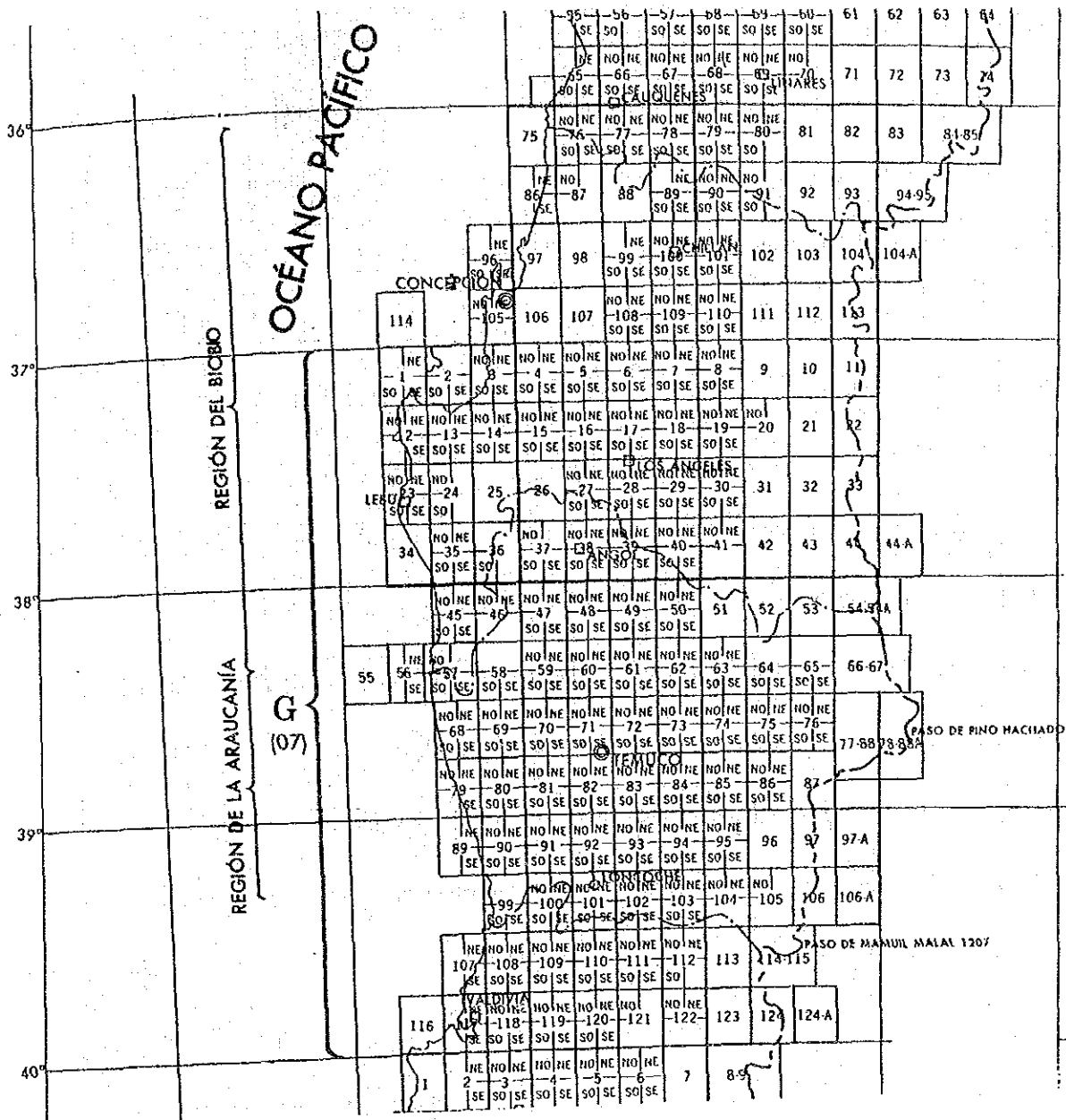


図3-2-1 第8州及び第9州を含む区域の1/25,000図と1/50,000図についての一覧図
 3桁までの数字で示されているのが1/50,000図で、それが4枚の1/25,000図 NE、SE、SO、NO
 に分割されている。NE、SE、SO、NO が示されていない数字だけの区域は1/25,000図がないこと
 を示している。



： オルソフォトの作製されている地域

図 3-5-2 チリ共和国におけるオルソフォト作製地域一覧

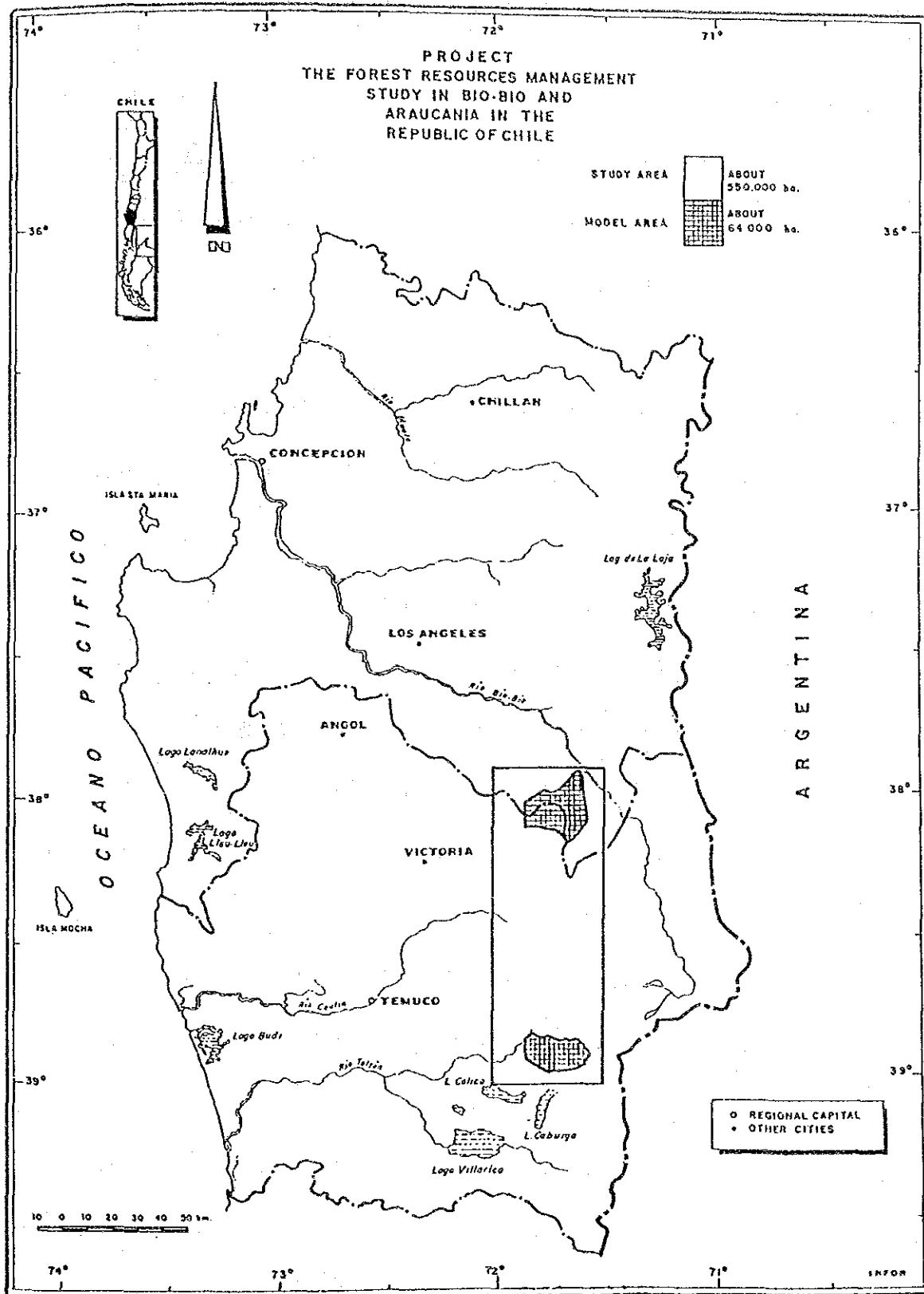


図 3-2-3 空中写真撮影区域撮影区域及びモデル地区

VALOR DE LOS TRABAJOS :

SECTOR Nº 1 = 550.000 Hás.

Con un total aproximado de 21 Líneas de vuelo y 1050 fotografías .

| | | |
|--|------|--------------|
| - Vuelo Fotogramétrico | U\$D | 28.000 + IVA |
| - Un set de fotografías | | 5.250 + IVA |
| - Un set de diapositivas | | 7.350 + IVA |
| - Cada copia adicional de fotografías | | 5.5 + IVA |
| - Cada copia adicional de diapositivas | | 7.5 + IVA |

SECTOR Nº 2 = 350.000 Hás.

Con un total aproximado de 21 Líneas de vuelo y 700 fotografías .

| | | |
|--|------|--------------|
| - Vuelo Fotogramétrico | U\$D | 22.000 + IVA |
| - Un set de fotografías | | 3.500 + IVA |
| - Un set de diapositivas | | 4.900 + IVA |
| - Cada copia adicional de fotografías | | 5.5 + IVA |
| - Cada copia adicional de diapositivas | | 7.5 + IVA |

VALIDEZ DE LA PROPUESTA :

Hasta Noviembre de 1990

FORMA DE PAGOS :

VUELOS FOTOGRAMETRICOS

50% A la firma del Contrato
50% Al termino de los vuelos

FUERZA AEREA DE CHILE
IIa. BRIGADA AEREA
SERVICIO AEROFOTOGRAFICO
GRAL. JUAN SOLER MANFREDINI

COTIZACION N° 99/100 /

FECHA 04 MAY 1998

MR. YUZURU OCHI
FORESTRY DEVELOPMENT DIVISION
(JICA)

COTIZACION

FAX: 03(346)5032

USUARIO INSTITUTO FORESTAL
DIRECCION HUERFANOS 554
TELEFONO 382666 - 396172
RUT _____
PEDIDA POR Sr. ROLANDO BENEDIC
FECHA _____

| CANTIDAD | ESPECIFICACION | VALOR UNITARIO | VALOR TOTAL |
|----------|---|----------------|--------------|
| | Ejecución de Vuelo Fotogramétrico a escala 1:20.000 con película Plus x blanco y negro, Sector I, según delimitación entregada. (550.000 ha) Antecedentes a entregar: 01 Juego de Fotogramas 01 Juego de Diapositivas 01 Índice del Vuelo efectuado Plazo Ejecución: 40 días Forma de pago: 30% al inicio del proyecto, saldo en 2 estados de pago. OBSERVACIONES: Las condiciones meteorológicas en la zona sur, son inestables por eso se requiere utilizar dos aviones en forma permanente. El vuelo se debe efectuar en los meses de septiembre y octubre.- IVA (16%) | NETO | C 15.460.000 |
| | | TAX | 2.473.600.- |
| | TOTAL | | 17.933.600.- |

NOTA: LOS PRECIOS ANTES INDICADOS NO INCLUYEN IVA. DE ACEPTAR LA PRESENTE COTIZACION, SE AGRADECERA REMITIR LA ORDEN DE COMPRA RESPECTIVA, PARA DAR INICIO A LA EJECUCION DEL TRABAJO. ESTA COTIZACION TIENE UNA VALIDEZ DE 30 DIAS CALENDARIO A CONTAR DE ESTA FECHA. LOS PRECIOS SEÑALADOS CORRESPONDEN SOLO A LAS CANTIDADES COTIZADAS.

INFORME DE PARTES
N° INC. 1212
Fecha 1 MAYO 1998

FUERZA AEREA DE CHILE
 11a. BRIGADA AEREA
 SERVICIO AEROFOTOGRAFOMETRICO
 GRAL. JUAN NOLAR MANFREDINI

COTIZACION N° 80/90
 FECHA: 18/ABRIL/90

COTIZACION

ENVIADO INSTITUTO EREZTAI
 DIRECCION HUERFANOS 554
 TELEFONO 382666 - 396172
 RUT
 PEDIDA POR SA. SERGIO FUENZALIDA
 FECHA CARTA N° 310

| CANTIDAD | ESPECIFICACION | VALOR UNITARIO | VALOR TOTAL |
|----------|---|----------------|---------------|
| | EJECUCION DE VUELO AEROFOTOGRAFOMETRICO A ESCALA 1:20.000 CON PELICULA PLUS-X B/N, DEL SECTOR 1 CURACAUTIN Y SECTOR 2 CURACAUTIN. | | |
| | VALOR NETO | | \$ 21.000.000 |
| | SECTOR 1 | | \$ 14.000.000 |
| | SECTOR 2 | | |
| | ANTECEDENTES A ENTREGAR | | |
| | 01 JUEGO FOTOGRAFIAS | | |
| | 01 JUEGO TRANSPARENCIAS EN NEGATIVO | | |
| | 01 JUEGO DE DIAPOSITIVA | | |
| | 01 INDICE DE VUELO | | |
| | PLAZO DE EJECUCION | | |
| | 40 DIAS | | |
| | FORMA DE PAGO | | |
| | 30% AL INICIO DEL PROYECTO, SALDO EN 3 ESTADOS DE PAGO. | | |
| | NOTA | | |
| | LAS CONDICIONES METEOROLOGICAS EN LA ZONA SON INESTABLES POR ESO SE REQUIERE UTILIZAR UN AVION EN FORMA PERMANENTE | | |

NOTA: LOS PRECIOS ANTES INDICADOS NO INCLUYEN 20% DE IVA (COSTOS INSTITUCIONALES). DE ACORDO A LA PRESENTE COTIZACION, SE AGRADECERA REMITIR LA ORDEN DE COMPRA RESPECTIVA, PARA DAR INICIO A LA EJECUCION DEL TRABAJO. ESTA COTIZACION TIENE UNA VALIDEZ DE 30 DIAS CALENDARIO A CONTAR DE ESTA FECHA. LOS PRECIOS SEÑALADOS CORRESPONDEN SOLO A LAS CANTIDADES COTIZADAS.

COTIZACION N°
 FECHA:

FUERZA AEREA DE CHILE
 11a. BRIGADA AEREA
 SERVICIO AEROFOTOGRAFOMETRICO
 GRAL. JUAN NOLAR MANFREDINI

COTIZACION

ENVIADO ANEXO
 DIRECCION
 TELEFONO
 RUT
 PEDIDA POR
 FECHA

| CANTIDAD | ESPECIFICACION | VALOR UNITARIO | VALOR TOTAL |
|----------|--------------------------|----------------|-------------|
| 1.423 | TRANSPARENCIA NEGATIVO | \$ 1.274** | |
| 1.423 | FOTOGRAFIAS EN PAPEL 8/N | \$ 1.293** | |
| | (SECTOR 1) | | |
| 926 | TRANSPARENCIA NEGATIVO | \$ 1.274** | |
| 926 | FOTOGRAFIAS EN PAPEL 8/N | \$ 1.293** | |
| | (SECTOR 2) | | |
| | IVA INCLUIDO | | |
| | OBS.: | | |
| | AVION: LEAR JET | | |
| | CAMARA OULD RC- 10 | | |

NOTA: LOS PRECIOS ANTES INDICADOS NO INCLUYEN 20% DE IVA (COSTOS INSTITUCIONALES). DE ACORDO A LA PRESENTE COTIZACION, SE AGRADECERA REMITIR LA ORDEN DE COMPRA RESPECTIVA, PARA DAR INICIO A LA EJECUCION DEL TRABAJO. ESTA COTIZACION TIENE UNA VALIDEZ DE 30 DIAS CALENDARIO A CONTAR DE ESTA FECHA. LOS PRECIOS SEÑALADOS CORRESPONDEN SOLO A LAS CANTIDADES COTIZADAS.

3-3. 森林資源調査

森林資源調査の実施内容についてはS/Wのとおり、2箇所のモデル・エリア（合計面積6万4千ha）について、地形図、土地利用図、植生図、林相図、森林管理計画図及び森林調査簿を作成することで合意した。

3-3-1. モデル・エリアの性格

① 第1モデル・エリア

ピオピオ川上流に位置するエリアで、面積3.8万ha。モデル・エリアのほぼ中央をピオピオ川支流のレナイコ川が東西に横切っている。レナイコ川の右岸は民有地のラジャータ・パイン造林地が多くみられ大面積の会社所有造林地と小面積の個人所有造林地が入り混じっている。条件の良い箇所に造林が進められ、急傾斜地、岩石地等条件の悪い箇所は天然林のまま残されている。

また、左岸はCONAF管理下の国有林で、現在は、禁伐の保護林に指定されている。林相はコイウエ、ロブル、ラウリ等のNothofagus属から成る天然広葉樹林である。

レナイコ川に沿って道路が奥地に達しているが、路面が悪く、降雨の後の通行は困難である。道路に沿って小さな集落が点在しているが、モデル・エリアのほぼ中央にCONAFの管理事務所があり、調査団のベース・キャンプ候補地のひとつとして挙げられる。

② 第2モデル・エリア

アジベン川支流のカラカルコ川等を含む流域で、面積2.6万ha。当エリア内の谷沿い緩傾斜地は放牧地として活用されており、森林は急傾斜地以上にみられる。山腹一帯も林間放牧の影響から粗林となっており生育も悪い。また、部分的に山火事跡地の若い2次林や、風倒木が目立つ老齢過熟林分もみられ、森林資源の内容は良くない。

また、条件の良い箇所にはラジャータ・パインの造林地がみられるが第1モデル・エリアほどのまとまりはない。

第2モデル・エリア内にもカラカルコ川等に沿った道路があるが、第1モデル・エリア同様に秋以降は路面が悪く車が通行不能となることも多いようである。第2モデル・エリアの調査のためのベース・キャンプはエリア手前の集落Cuncoが適当と考えられる。

3-3-2. 既存調査結果等の活用

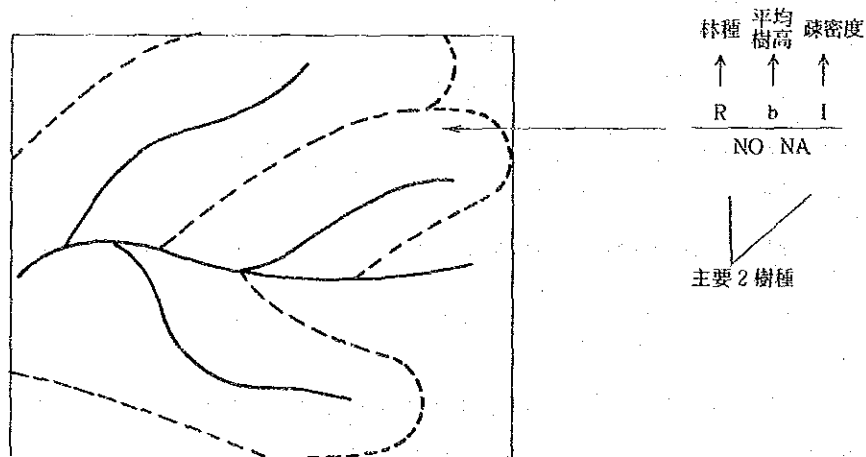
① 植生図はINFORがFAOの指導、協力のもとに作成したものがあ（1964年、1979年版）。しかし、1964年版と1979年版では植生区分の方法が異なるので注意を要する。なお、当報告書で紹介した植生区分は1964年版の方である。いずれにしても、これ

ら植生図の作成時期は古く、近年の拡大造林により人工造林地が増え状況はかなり変化していると考えられること、また、縮尺が50万分の1と大きく、モデル・エリアの植生を特徴づけるには精度の上から不十分であることなど利用上の制約がある。

② 林相図についてはCONAF作成のものがある。当林相図では空中写真をもとに林分を林班区画し、各々の林班について林種、平均樹高、疎密度、主要2樹種のデータを表示している。

しかしながら、これら指標のうち材積を示すものがないことから、森林資源管理計画のための活用には不十分である。また、この林相図も部分的に整備されているに過ぎず、今回のモデル・エリアを含むものは作成されていないとのことであった。

第3-3-1 図 CONAFによる林相図について



| (林種) | (平均樹高) | (疎密度) |
|-------|----------|-------------|
| B 天然林 | a 20m～ | 1. 75～ 100% |
| P 人工林 | b 12～20m | 2. 50～ 75% |
| R 2次林 | c 8～12m | 3. ～ 50% |
| | d 4～ 8m | |

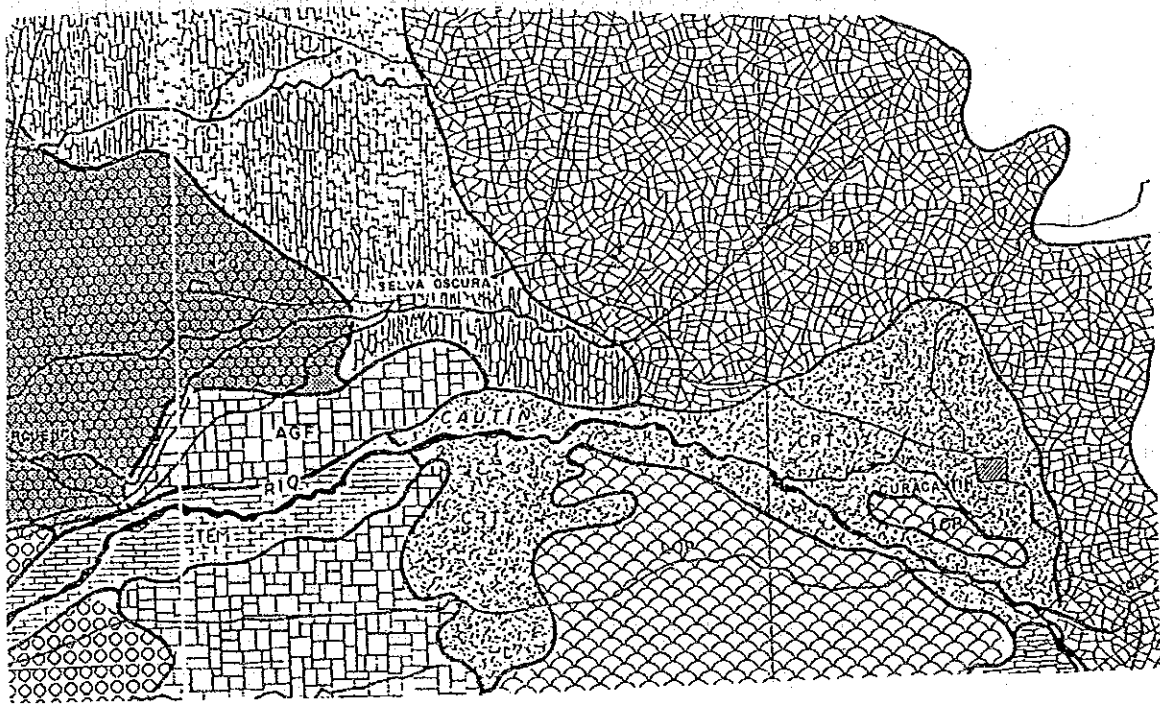
(主要2樹種)

NO ; Nothofagus obliqua ロブレ

NA ; Nothofagus alpina ラウリー

③ 土壌図についてはチリの大学等で調査、作成されたものがある。土壌分類の方法は我が国の分類法と異っており、チリ独自の分類基準を用いているようである。詳細は不明だが、チリの国土に合った実用性の高いものであると考えられることから、今回の調査

で作成する森林調査簿の調査アイテムに採用しても良いと考えられる。



8.6.34. Serie Santa Bárbara (SBA)

| | |
|------------------------|---|
| ASOCIACION | : Santa Bárbara. |
| SERIE | : Santa Bárbara. |
| CLASIFICACION | : Ashy, medial, mesic, Typic Dystrandept. |
| UBICACION | : A 16 km al este de Mulchén, por camino a Santa Adriana. |
| FISIOGRAFIA | : Cordillera de los Andes. |
| TOPOGRAFIA | : Ondulada con pendientes complejas de 3 a 5%. |
| DRENAJE | : Bueno. |
| VEGETACION | : Formación de Bosques abierto andino sin coníferas. Especies dominantes Nothofagus. |
| TEMPERATURA DEL SUELO | : Media anual 13-14°C; media julio 8-9°C; máxima media enero 26-28°C. |
| REGIMEN DE TEMPERATURA | : Méjico. |
| PLUVIOMETRIA | : Anual 1.500-2.000 mm; otoño 400-600 mm; invierno 700-1.000 mm; primavera 250-400 mm; verano 100-200 mm. |
| REGIMEN DE HUMEDAD | : Udico. |
| MATERIAL PARENTAL | : Cenizas volcánicas modernas. |

図 3-3-2 チリの土壤図の一例

- ④ チリにおいては森林調査簿の整備はなされていない。
この分野では活用できる既存の資料、調査等はないものと思われる。

3-3-3. 現地調査

第1、第2モデル・エリア内の植生区分については、空中写真の活用によりおおまかにではあるが、前記5区分の天然林と人工林のタイプ区分が可能である。また、林相区分についても、今回の事前調査における現地飛行の経験から、構成樹種、樹冠直径、樹高、疎密度等を読みとることが可能で、これらをもとに林班区分ができることが分かった。従って、空中写真を利用して、土地利用図、植生図及び林相図を作成することができる。

また、モデル・エリア内に空中写真等を利用して標準地を設定し、それら標準地内の詳細な調査を行う必要がある。つまり、標準地内の樹木の樹種、胸高直径、樹高、形質等を調査し、その結果に基づき、モデル・エリア全体の総蓄積や樹種別、直径階別、品質区分別等の所要の区分ごとの蓄積を把握することが適当と考えられる。

この場合、特に注意すべきことからは、樹木の疎密度が箇所により著しい差異をみせており、ある箇所では密に樹木が生立しているのに対し、他の箇所では点在している状態が一般なので、適切な標準地のとり方に工夫がいる。

3-3-4. 森林調査簿の調査アイテム

森林調査簿の調査アイテムについては、その森林調査簿を森林資源管理計画の策定に役立てるものであるから、当該計画樹立のための必要最少限度のアイテムをもち込むことが適当と考えられる。

具体的には、林班名、面積、林齢、斜面の方位及び傾斜、樹種、混合歩合、疎密度、胸高直径、樹高、材積等が必要になると考えられる。

なお、樹種別の立木材積表が十分に整備されておらず、標準地調査と同時に、これら材積表作成のための調査が必要になる。

3-4. 森林管理計画

3-4-1. 計画策定の基本方針

この森林管理計画は、首都サンチャゴの南約 600kmの南緯38°～39°に位置する第8、9州のアンデス山脈の西麓において実施されるものであるが、計画の策定にあたっては下記の事情を踏まえて、環境への影響を最小限に抑えつつ、かつ地域経済、住民への発展に寄与し得るような、保全と利用との調和及び森林資源の充実に十分配慮した計画を策定することが必要である。

- (1) オーストラリアにおけるユーカリ伐採反対運動等により、世界的に広葉樹木材資源、特に、広葉樹チップに対する需要が逼迫してきており、このため、チリにおける Coigue, Rauli, Roble等のブナ科を中心とする豊富な天然林資源に対し、世界の目が向けられており、近年その急速な開発が進められていること。
- (2) 日本企業等との合弁でチップ工場の建設がこの2～3年の間に急速に進められており、中小森林所有者を巻き込んだ急速な森林開発に対して、一部の住民、マスコミから自然破壊が行われているとの批判の声があがっていること。
- (3) 1万ha程度以上の森林を保有している大規模森林所有者は自ら林業技術者を擁し、比較的適正な施業を行なっているとされているが、50ha程度以下の中小規模森林所有者は経済動向に左右された無計画な伐採を行いがちであること、牧場等への転用の際必要以上の伐採、焼払いが行われていること、及び相当数にのぼるとみられる無許可伐採等により、広葉樹天然林が急速に失われつつあること。

3-4-2. 計画概要

モデル地域は第8、9州に2箇所を選定し、64,000ha(北部36,000ha及び南部28,000ha)を対象とすることとする。

第8、9州はチリの中でも優良な天然広葉樹林の北限にあたる地域であり、近年の広葉樹資源逼迫の中で、適正な資源管理計画の作成が特に望まれている地域である。

このうち北部地域はビオビオ川(Rio Bio Bio)の支流が西方から入り、さらに東に進んでから南に曲がり分水嶺に至る地域であり、調査対象は1流域にまとまっている。西側の対象地域入口付近は人工林の多い地域であるが、上流側は天然林と人工林がいきり交じった民有林と、保存林である国有林が、ひとつの流域をはさんで対峙している土地所有形態となっており、分水嶺上には天然記念物であるAraucaria (ナンヨウスギ科、*Araucaria araucana*) が点生しているのがうかがえる。なお、上流に向かう支流が東から南に屈曲する付近(Collipulli から東へ約70kmの付近)にはCONAFのMalleco事務所が存在する。

一方、南部地域はアジペン川(Rio Allipen)に流入するいくつかの小流域でもって構成される山塊であり、全体として数10haから数100haと比較的小規模の土地所有者が点在しており、森林から牧場等への転用が相当進められ、また、このための火入れにより場所によっては山頂付近まで森林が喪失しているところもみられる民有林地域である。

いずれの地域においても地形は相当急峻であり、そのイメージとしては我が国の東北地方のブナ林地帯にカラマツの造林地が点在している風景が思い浮かべられよう。

これらのモデル地域はS/Wにあるように、生産対象林計画と保護対象林計画に分けて計画を作成するものとする。

まず、生産対象林計画については農牧業等の土地利用との整合性を図りつつ、適正な森林の管理経営により持続的な木材生産を可能にすることを目的として、土地利用、造林、森林保護、素材生産、林道、環境への影響、社会経済への影響等について調査を行う。特にチリ側の資料では木材生産の保続に必要な材積の調査がなされていないことから本格調査にあたり材積調査は必須条件となる。なお、木材生産計画においては地域に存在する零細な移動製材所の存在についても配慮が必要となろう。

一方、保護対象林計画については、森林利用の進展により、将来的には採算性が確保された段階で、生産林的取扱いがなされる保存林をも含んでいることから、これを念頭に、生産林に準じた土地利用等の可能性の調査を行うとともに、野性生物の保護、樹種の保護等の調査もあわせて行うこととする。また、この地域については、試験地を設け、将来的な利用の可能性の実証を行うことについての調査研究についても検討を行うこととする。

森林の区画については、適当な規模で森林を区画整理しておくことは、森林の管理・経営を行っていくうえで有効であると考えられることから、チリ側の有する林相図を参考にして適切な区分け(例えば尾根等を境に林班を分け、林相の違いにより小班分けを行う)を検討することとする。

計画の策定にあたってはのチリの森林法(1974年及び1980年)を踏まえたものとする必要があるが、森林法では触れられていない森林計画については、我が国の例を勘案し、チリ側の実態に応じた制度の提言が行われることが適当であると考えられる。

3-4-3. 造林計画

調査対象地域内の人工林は、主にラジアータパインが植えられているが、これらの地域は山体の傾斜が急なため、場所によっては生育状況が不良なところもかなり見受けられる。

チリ側の意向としては、今後天然林の山は天然林として持続的に利用していきたいとのことであり、また、調査対象地域は生態的にも天然林施業に適していると思受けられるところから、更新にあたっては天然更新の考え方を主とするとともに、場所によってはチリ

側でおこなわれているRauli等の造林試験の結果(間伐を行っていくことにより10m³/年以上の成長がある。)を参考にしつつ、苗木の供給計画を含んだ人工更新の方法についても検討が必要である。

なお、Rauli, Robleについては英国を含めチリ国内でも試験研究がすすんでいるが、広葉樹のうち最大の蓄積を有するCoigueについては調査は皆無であるということから、この樹種に対する情報の入手、必要な調査についても検討を進めていく必要がある。

施業を行っていくに際しては、当地域の地形が急峻であること、ササ、バラ等の下層植生が我が国と同様に優勢であることから、確実な更新を図る手段を講じることに留意する必要がある。

3-4-4. 森林保全計画

飛行機による上空からの視察によれば、両調査対象地域とも山火事による森林の喪失は相当な面積に上っているものと見受けられることから、山火事防止のための必要な体制づくりについて検討が必要であろう。

また、当地域は地形が急峻であり、牧草地への転用箇所を中心とした山腹崩壊箇所も見られる等、人為の影響による土砂崩壊等を起こしやすいと考えられることから、伐採規制による治山への配慮、エロージョンの進んだ箇所については早生樹種による治山、さらに必要な箇所については山腹工、流路工等の治山工事の施行計画についても検討が必要となる。また、全体的な森林保全については我が国における保安林制度が参考になるものと考えられる。

小規模な森林所有者が牧場等の経営を含めた利用をしている地域については、森林造成も含めた最も有効な土地利用を行い得るような、総合的な土地利用計画づくりが必要である。

3-4-5. 森林及び環境保護

チリは全国に34箇所、687万haの国立公園を有し、それらは国有地として伐採等の人為は加えず、もっぱら保護と観光のために使用するという、米国の国立公園に近いと思われる公園システムをとっている。今回の調査地域内の第9州の国有林についてみると国立公園は5箇所15万ha、記念林は1箇所が指定されている。

調査対象区域に分布しているAraucariaについては、前政府においては枯死木の利用、許可制による輸出が認められていたが、本年4月には一切の輸出が禁止されることになった。

調査対象地域のうち北部地域については、稜線上に伐採禁止措置がとられているAraucariaが分布しているなど、チリの天然林を代表する地域のひとつでもあることから

ら、天然林取扱いのモデル地域として保護・保全に十分留意した取扱いが必要である。

林木の保護のための法令としては、*Araucaria* 及び *Alerce* (ヒノキ科、*Fitzroya cupressoides*) について、1976年に天然記念物宣言が行われている。また、これらはワシントン条約附属書 I に含まれる樹種となっている。

Araucaria の資源状況としては、第 8、9 州に約 20 万 ha が分布し、このうち約 9 割が第 9 州に存在している。

最近、世界的に開発計画の環境に対する影響評価の厳正な調査が求められるようになってきたことから、本格調査にあたっては JICA、OECD の環境配慮へのガイドラインに沿った調査と計画の策定が必要となるとともに、ワシントン条約附属書に含まれる動植物について現地でのその有無の確認等により、貴重生物の保護問題に対しては万全を期していくことが必要である。

3-5. その他

3-5-1. 供与機材

チリ側は本開発調査を実施するにあたって、次の機材の供与を強く主張し、S/Wにおいても車両及び資機材の供与について触れた。

| | |
|-------------------------|------|
| 1) 車両 (4WD、ダイハツ Locky等) | 3台 |
| 2) 通信機器 (携帯用、自動車用) | 1式ずつ |
| 3) デジタイザー | 1式 |
| 4) プロッター | 1式 |
| 5) パソコン | 1式 |
| 6) プリンター (レーザー、カラー) | 1式ずつ |
| 7) ソフトウェア | 4種類 |
| 8) コピー機、電動タイプ | 1式ずつ |

これら資機材は、本格調査において必要であり、現地踏査や現地 (首都及び地方) での資料取りまとめ、森林資源調査データの解析などに利用される。また、INFOR等関係機関における現有機器の稼動状況も非常に良い状態であるので、供与後の利用稼動については問題はないと予想される。

なお、4)~8)については、チリにおいて調達するよりもアメリカ等で購入できれば価格は約半額になる旨の説明があったが、本格調査時点での購入方法 (本邦調達か現地調達か) 及び予算上の制約から、供与時期や供与品目の削減等は適宜判断する必要がある。プライオリティーは 1) から順に低くなる。

2)~8)についてのチリ側から提出された要望書は資料3-5-1 のとおり。

EQUIPOS DE APOYO SOLICITADOS A JICA.

1) EQUIPOS DE COMUNICACION.

| | |
|---|--------------|
| -ICOM Modelo ICH 18, 2 unid portatiles. | US\$ 1,010.- |
| -ICOM Modelo V200, 2 unidades moviles. (equipos para Banda 2 metros VHF (144 Megaciclos) uso civil) | US\$ 1,800.- |
| -Antenas 2 unidades. | US\$ 240.- |

TOTAL EQUIPOS DE COMUNICACION. US\$ 3,050.-

2) EQUIPOS DE APOYO EN OFICINA.

| | |
|---|--------------|
| -Fotocopiadora CANON NP1010 o similar (ver folleto) | US\$ 2,300.- |
| -Maquina de escribir OLIVETTI ETV 2700 o similar (ver folleto) | US\$ 3,712.- |

TOTAL EQUIPOS DE OFICINA. US\$ 6,012.-

TOTAL EQUIPOS DE APOYO. US\$ 9,062.-

NOTA: Los precios corresponden al mercado chileno.

LISTADO DE EQUIPOS Y SOFTWARE SOLICITADOS A JICA.

A) EQUIPOS.

| | |
|---|--------------|
| 1. Mesa digitalizadora NUMONICS Modelo 2200 115 x 152 cms. | US\$ 8,260.- |
| a) Fuente de poder. | US\$ 236.- |
| b) Cursor de 16 botones. | US\$ 360.- |
| <hr/> | |
| TOTAL | US\$ 8,856.- |
| 2. Plotter IOLINE Modelo LF4000 | US\$ 7,275.- |
| a) Cable interface (PC-Ploter) | US\$ 60.- |
| <hr/> | |
| TOTAL | US\$ 7,335.- |
| 3. PC AT IBM o similar 2MB RAM,1 drive 1.2 MB 1 HDisk 70 MB o mas 16 Mhz o mas con monitor color Multiscanning VGA y Tarjeta video VGA Multisync 16 bits,Resolucion de 800 x 600 (ver folleto) | US\$ 5,100 |
| a) Coprocesador Matematico 80387 | US\$ 450.- |
| <hr/> | |
| TOTAL | US\$ 5,550.- |
| 4. Impresora Laser NEC-890 Laser 3 megabytes | US\$ 3,660.- |
| Impresora 7 colores ALPS ALQ224e o similar (Ver folleto) | US\$ 1,300.- |
| <hr/> | |
| TOTAL | US\$ 5,960.- |

B) SOFTWARE.

1. FANAP (Geographics Information System)
version PC.

a) Modulo MAPPED US\$ 8,113.-

b) Modulo ANALYSER US\$ 8,113.-

c) Modulo INTERPRETER US\$ 4,543.-

2. AUTOCAD Version 10 FULL 3D US\$ 3,600.-

TOTAL US\$ 24,369.------
TOTAL EQUIPOS Y SOFTWARE US\$ 52,070.-

Los precios incluyen el Impuesto IVA (16%) y son precios en el mercado chileno al 18/Abril/1990.

La numeracion de cada item indica orden de prioridad.

Los precios que a continuacion se indican corresponden a precios de equipos similares o iguales en el mercado de Estados Unidos de Norteamerica (USA).

Mesa Digitalizadora CALCOMP 91480 36" x 48"
(similar a NUMONICS 2200) US\$ 3,400.-

Ploter IOLINE 4000 Multi-pen US\$ 4,095.-

IBM PS-2 Modelo 70 16 mhz, HDisk 70 MB,1 drive
1.2 MB, 2MB RAM. US\$ 4,200.-

Software AUTOCAD release 10 FULL 3D US\$ 2,195.-

TOTAL PRECIOS EN ESTADOS UNIDOS DE NORTEAMERICA US\$ 13,890.-

CUADRO COMPARACION PRECIOS ENTRE MERCADO CHILE Y ESTADOS UNIDOS

| EQUIPO | Precio CHILE | Precio ESTADOS UNIDOS |
|-----------------------|---------------|-----------------------|
| MESA DIGITALIZADORA | US\$ 8,260.- | US\$ 3,400.- |
| PLOTTER | US\$ 7,275.- | US\$ 4,095.- |
| COMPUTADOR PERSONAL | US\$ 5,100.- | US\$ 4,200.- |
| SOFTWARE AUTOCAD v.10 | US\$ 3,600.- | US\$ 2,195.- |
| TOTAL | US\$ 24,235.- | US\$ 13,890.- |

3-5-2. 研修員受入

チリ側は、本開発調査を実施するにあたって、日本でカウンターパート研修を行うよう要請した。受け入れ人数は、3か年の調査の間約5名が適切であり、時期は初年次1名、2及び3年次に2名づつを一人当たり3～6か月間受け入れられるよう配慮する必要がある。

また、本開発調査が行われる間、作業地域はチリ国内及び日本国内において実施されることになるが、本開発調査の担当となるC/P2名について、チリ側の要望では、調査にあたるコンサルタントと可能な限り行動を共にして、調査の進行過程における技術をすべて吸収したいと考えており、C/P研修機関ではカバーできない部分については自国の負担によっても実行したいと非常に意欲的である。よって、受入時期については、本格調査の国内作業時期とのすり合わせを行い、より効果的な研修となるよう努める必要がある。

C/PとなるINFOR職員の資質も平均して高く、研修のレベルは高度なものが求められるであろう。

受け入れにあたってのA2。フォーム提出等事務手続きについては、担当者(R. Bennewitz)に説明しており、JICA事務所からの連絡や手続きがスムーズに運ぶことを期待する。

3-5-3. 開発調査技術セミナー開催

チリ側は、本開発調査を実施するにあたって、調査結果及びその過程等を広く一般にも理解してもらい、それに必要な技術について講義する、開発調査技術セミナーの開催を強く要請した。

その開催時期、場所については、サンチャゴ、コンセプション、テムコ3か所において可能であれば数回行ってほしい旨の要望があった。首都におけるセミナーでは、主として役人に調査内容を理解してもらうために、地方においては一般民間人や技術者等のより多くの者に対してのために、との要望であり、チリ側の習慣としても同様のセミナーの開催を行っていることもあり、本調査の目的を効果的に達成させられる有力な手段であると認められる。

よって、予算上の制約により回数は1回程度が妥当と思われるが、開催地は3か所においてドラフトファイナルレポート説明時に実施することが望ましい。

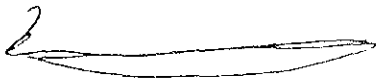
4. 参 考 資 料

- 4-1. S/W
- 4-2. 森林法
- 4-3. 関係機関略語
- 4-4. 航空写真関連図面
- 4-5. 各種補助金、利用許可、証明等申請様式
- 4-6. 本調査団来訪に関する新聞記事
- 4-7. その他関連新聞記事
- 4-8. 収集資料リスト

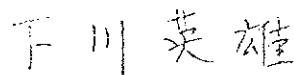
SCOPE OF WORK
FOR
THE FOREST RESOURCES MANAGEMENT STUDY
IN BIO BIO AND ARAUCANIA
IN
THE REPUBLIC OF CHILE

AGREED UPON BETWEEN
THE MINISTRY OF "CORPORACION DE FOMENTO DE LA PRODUCCION (CORFO)"
AND
THE JAPAN INTERNATIONAL COOPERATION AGENCY


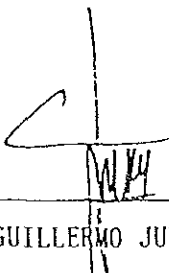
Santiago, April 19, 1990



MR. RENE ABELIUK MANASEVICH
MINISTRO VICEPRESIDENTE EJECUTIVO
CORPORACION DE FOMENTO
DE LA PRODUCCION



MR. EIO SHIMOKAWA
LEADER OF THE PRELIMINARY
SURVEY TEAM
JAPAN INTERNATIONAL
COOPERATION AGENCY



MR. GUILLERMO JULIO ALVAREZ
DIRECTOR EJECUTIVO
INSTITUTO FORESTAL

I. INTRODUCTION

In response to the request of the Government of the Republic of Chile (hereinafter referred to as "the Government of Chile"), the Government of Japan decided to conduct the Forest Resources Management Study in the Republic of Chile (hereinafter referred to as "the Study") in accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of Chile signed on July 28, 1978.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programmes of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of Chile.

The present document sets forth the scope of work with regard to the Study.

II. OBJECTIVES OF THE STUDY

The objectives of the Study are :

- 1) To take the aerial photograph in the Study Area (approximately 550,000 ha),
- 2) To formulate a forest management plan in the Model Area (approximately 64,000 ha) included in the Study Area, and thus contributing to the sustainable development of forest resources management in Chile.

III. OUTLINE OF THE STUDY

1. Study Area

The Study Area will cover approximately 550,000 ha, including the Model Area, approximately 64,000 ha. (See APPENDIX I)

2. Scope of the Study

- (1) The contents of the field survey and collection of the existing data are as follows:

ES



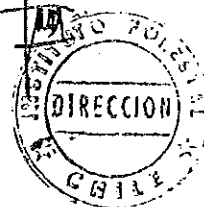
- a. National policy,
 - (a) National development policy
 - (b) Forestry policy
 - (c) Environmental policy
 - (d) Regional development policy
 - (e) Others
- b. Regional condition,
 - (a) Population condition
 - (b) Socio-economic condition
 - (c) Traditional forest management system
 - (d) Land use condition
 - (e) Vegetation condition
 - (f) Forestry and forest products condition
 - (g) Wildlife condition
 - (h) Others

(2) To take the aerial photograph in the Study Area. That scale is 1/20,000.

(3) To prepare maps and others in the Model Area, which are as follows:

- a. Topographic map,
- b. Land use vegetation map,
- c. Forest type map,
- d. Forest management map,
- e. Forest inventory books,

ES



(4) To formulate a forest management plan on the following items in the Model area:

a. Productive forest programme,

- (a) Land use
- (b) Afforestation
- (c) Forest protection
- (d) Forest products
- (e) Forest road
- (f) Environmental impacts
- (g) Socio-economic impacts
- (h) Others

b. National Reserved forest programme,

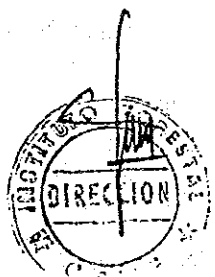
- (a) Land use
- (b) Afforestation
- (c) Forest protection
- (d) Forest products
- (e) Forest road
- (f) Environmental impacts
- (g) Socio-economic impacts
- (h) Wildlife conservation
- (i) Tree species conservation
- (j) Experimental plots
- (k) Others

(5) To hold a technology transfer seminar on forestry management for Chilean counterparts in Chile in the course of Study.

IV. WORK SCHEDULE

The Study shall be carried out in accordance with the attached tentative schedule. (See APPENDIX II)

ES



V. REPORTS

JICA shall prepare and submit the following reports to the Government of Chile. (See APPENDIX II)

1. Inception Report:

twenty (20) copies in English at the beginning of the Study in the Republic of Chile.

2. Interim Report:

twenty (20) copies in English,

3. Draft Final Report:

twenty (20) copies in Spanish, the Government of Chile will provide JICA with its comments within one month after the reception of the Draft Final Report.

4. Final Report:

fifty (50) copies in Spanish, JICA will prepare the Final Report within two months after the reception of the comments of Government of Chile on the Draft Final Report.

5. Aerial photograph and others in the Study Area:

(1) Negative films (scale; 1/20,000, 1 set)

(2) Contact prints (scale; 1/20,000, 1 set)

6. Maps and others in the Model Area:

(1) Topographic map (scale; 1/20,000, 1 set)

(2) Land use vegetation map (scale; 1/20,000, 1 set)

(3) Forest type map (scale; 1/20,000, 1 set)

(4) Forest management map (scale; 1/20,000, 1 set)

(5) Forest inventory books (1 set)

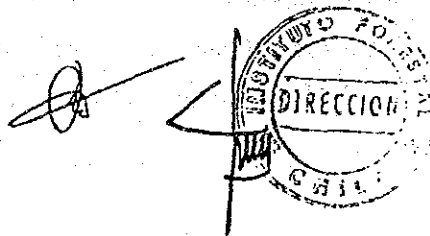
VI. UNDERTAKING OF THE GOVERNMENT OF CHILE

1. The Government of Chile accords privileges, immunities and other benefits to the Japanese study team, in accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of Chile.



2. To facilitate smooth conduct of the Study, the Government of Chile shall take necessary measures;
- (1) to secure the safety of the Japanese study team ,
 - (2) to permit the members of the Japanese study team to enter, leave and sojourn in Chile for the duration of their assignment therein, and exempt them from alien registration requirements and consular fees,
 - (3) to exempt the members of the Japanese study team from taxes, duties and any other charges on equipment, machinery and other materials brought into Chile for the conduct of the Study,
 - (4) to exempt the members of the Japanese study team from income taxes and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese study team for their services in connection with the implementation of the Study,
 - (5) to provide necessary facilities to the Japanese study team for the remittance as well as utilization of the funds introduced into Chile from Japan in connection with the implementation of the Study,
 - (6) to secure permission for entry into private properties or restricted areas for the conduct of the Study,
 - (7) to secure permission for felling the trees and collecting the plants necessary for the implementation of the Study,
 - (8) to secure permission for the Japanese study team to take all data and documents (including aerial photographs and their negative films) related to the Study out of Chile to Japan,
 - (9) to secure permission of the flight for the aerial photography and use of airports for the implementation of the Study,
 - (10) to secure clearance for the use of communication facilities including tranceivers,

ES



(11) to obtain the agreement of adjacent countries for the implementation of the aerial photography along the national boundary,

(12) to provide medical services as needed. Its expenses will be chargeable on members of the Japanese study team.

3. The Government of Chile shall bear claims, if any arises against the members of the Japanese study team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Japanese study team.

4. Instituto Forestal (hereinafter referred to as "INFOR") shall act as counterpart agency to the Japanese study team and also as coordinating body to other relevant organizations concerned for the smooth implementation of the Study.

5. INFOR shall, at its own expense, provide the Japanese study team with the following, in cooperation with other relevant organizations:

- (1) available data and information related to the Study,
- (2) counterpart personnel,
- (3) suitable office space with necessary equipment in Santiago, Concepcion, Temuco,
- (4) credentials or identification cards,
- (5) appropriate number of vehicles with drivers, typists and laborers, necessary for the implementation of the Study.



VII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures:

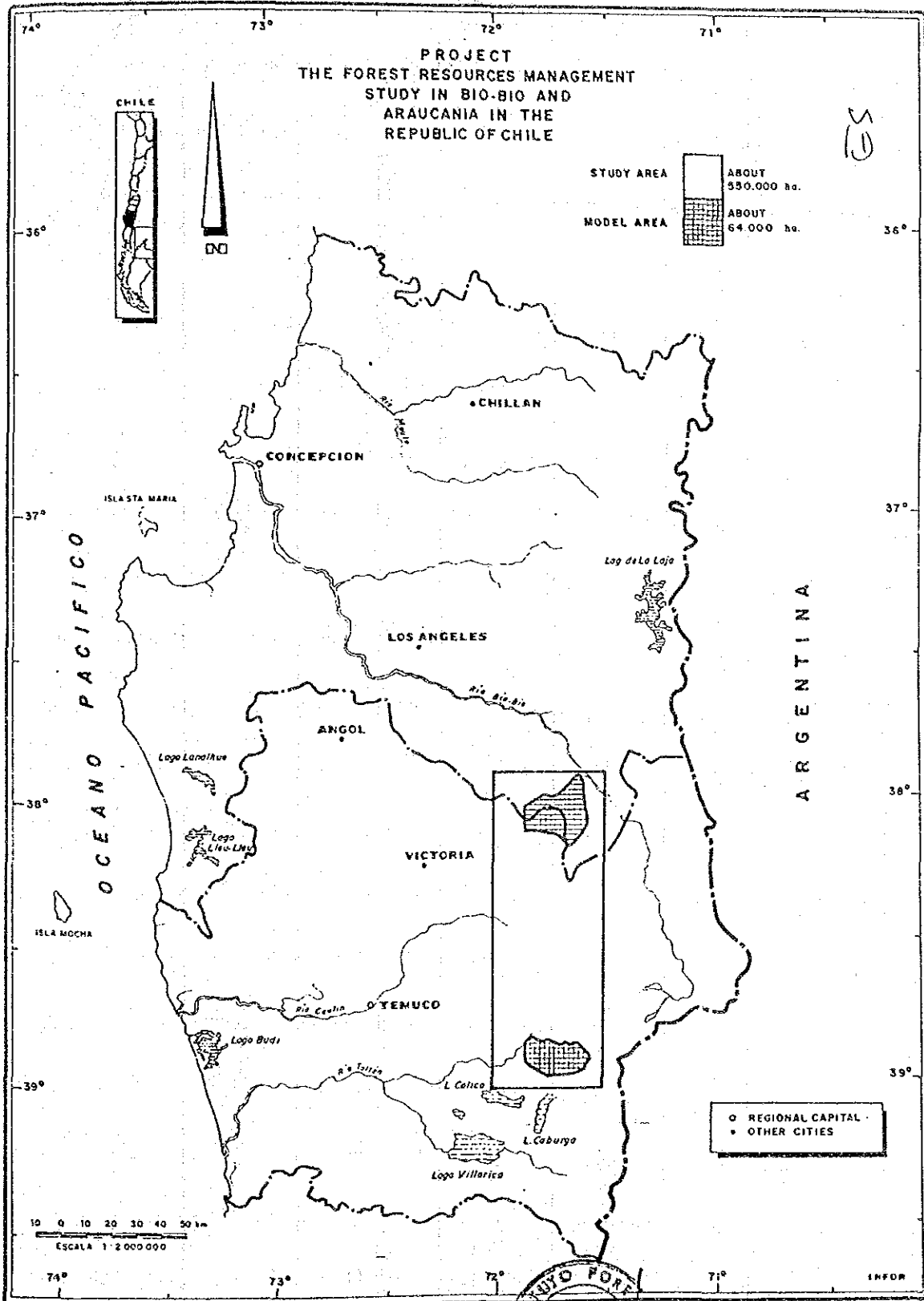
- (1) to dispatch, at its own expenses, study teams to Chile,
- (2) to pursue technology transfer to the Chilean counterpart personnel in the course of the Study,
- (3) to provide the following equipment and machinery for the implementation of the Study, which will remain the property of the Government of Japan unless otherwise agreed upon:
 - a. vehicle(s)
 - b. equipment and machinery for field survey
- (4) to accept the training of counterpart personnel in Japan.

VIII. CONSULTATION

JICA and INFOR shall consult with each other in respect of any matter that may arise from or in connection with the Study.



APPENDIX - I

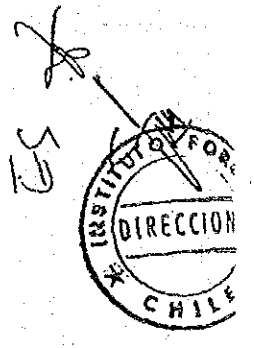


APPENDIX II

Tentative Work Schedule

☐ in Japan
 ▬ in Chile

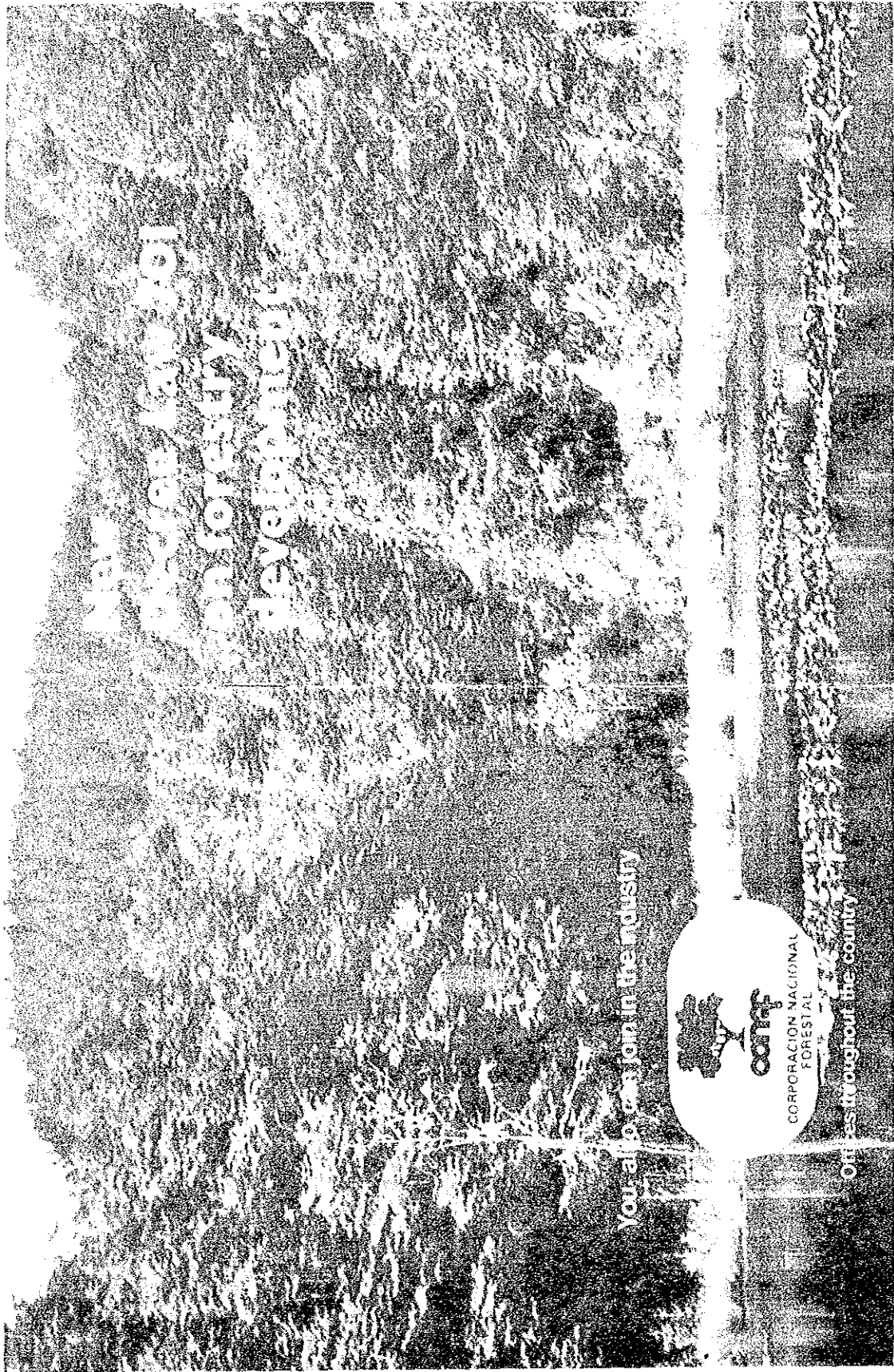
| ITEM | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|--|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1. AERIAL PHOTOGRAPH | | | | | ▬ | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. PREPARATION OF MAPS AND OTHERS | | | | | | | | | ☐ | | | | | | | | | | | | | | | | | | | | | |
| 3. FORMULATION OF A FOREST MANAGEMENT PLAN | | | | | | | | | | | ☐ | | | | | | | | | | | | | | | | | | | |
| REPORTS | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



4-2. 森林法

- ① New Decree Law 701 on Forestry Development
- ② Supplementry Regulations to Legislative Decree No701 (year 1974) ON Forestry Development, 1980

※ 相方とも西語が存在する



Nº 2565. -- CONSIDERING: the terms of Decree laws Nºs. 1 and 128 of 1973, 527 of 1974 and 991 of 1976.

The Honourable Junta of Government of the Republic of Chile issues the following:

Decree Law

FIRST ARTICLE: Replace the text of Decree law Nº 701 of 1974, and subsequent amendments therein incorporated, by the following, maintaining the same decree law number:

PRELIMINARY CHAPTER

ARTICLE 1. -- The legal regime for lands preferentially suitable for forestry shall be subject to the terms of instant decree law and other complementary regulations.

ARTICLE 2. -- For the purposes of this decree law, the following definitions shall apply:

LANDS PREFERENTIALLY SUITABLE FOR FORESTRY

All lands which, because of climatic and soil conditions, should not be permanently ploughed, whether or not covered by vegetation, excluding those which, without degradation, may be used for agriculture, fruit growing or intensive cattle raising.

AFFORESTATION: The act of planting tree or bush species in treeless lands, or those which, being covered with vegetation, are not susceptible to economic development, nor improvement by management.

REFORESTATION: The act of covering with tree or bush species by plantation, managed regeneration or sowing, any land which has been subjected to extractive operations. For the purposes of this law, reforestation will be understood to mean plantations which may be made in lands worked since October 28, 1974.

MANAGEMENT PLAN: The plan which regulates the use and rational utilization of renewable natural resources in a determined area, in order to obtain therefrom the maximum benefit, at the same time ensuring the conservation, improvement and growth of said resources.

CORPORATION: The National Forestry Corporation.

ARTICLE 3. -- Lands preferentially suitable for forestry, natural and artificial forests, whether owned by private or legal persons, which are subject to the terms of instant decree law, shall not be subject to the terms of Law Nº 16.840 on land reform.

CHAPTER 1 On the classification of forestry lands

ARTICLE 4. -- The classification of lands preferentially suitable for forestry shall be effected by the Corporation on request by the owner, accompanied by a technical study of the land and its consequent classification proposal, prepared by a forestry engineer or a specialized agronomist.

The Corporation must give its ruling within a period of 60 days as from the presentation of the request. If this is not done, then the classification proposed by the presenting person shall be assumed to be approved.

In both cases, and in the situation described in Article 6, the Corporation shall extend a certificate which will be valid for all cases where the law or any regulation demands accreditation of the quality of lands preferentially suitable for forestry.

ARTICLE 5. -- If the Corporation rejects all or part of the request, the party concerned may appeal before the Juez de Letras de Mayor Cuantía en lo Civil (Judge of the Civil High Court) of the Department, where the land is situated, if the land should be located in more than one

department, the Judge of either will be competent to rule. The appeal must be presented within 30 days after the date of despatch of the registered letter in which the Corporation notifies its rejection. For all purposes, the domicile of the interested party shall be that shown on his request.

The Court will hear the matter, not in the form of trial and without further recourse, but by hearings of the interested parties and with an obligatory technical report prepared by a forestry engineer or specialized agronomist, named by common agreement between the parties. If they fail to agree, the Court will nominate the specialist. Ruling must be made within 60 days.

ARTICLE 6. -- For the purposes of this decree law, the Corporation may make the classification referred to in Article 4, without any request by the interested party or parties. This classification will be published once only in the Official Gazette (Diario Oficial) and in a newspaper of the province or region in which the land is located, if one exists, and the interested parties shall also be advised by registered letter. Appeals may be lodged against this classification before the Court indicated above.

which will hear the appeal in accordance with the procedure therein indicated. The period for appeal shall be 90 working days as from the publication of the insertion in the Official Gazette, which must be made on the 1st. or 15th. of each month, or the first subsequent working day. The insertions must contain at least the following:

- a) Name or names by which the property is known;
- b) Precise location within the region, province and district;
- c) Approximate boundaries and area;
- d) Names of the proprietor (s) or occupants of adjoining properties where possible;
- e) Tax roll, and
- f) Period allowed for appeal.

ARTICLE 7.- The Corporation may authorize the annulment of the classification of being preferentially forest land from any property only in exceptional and duly justified cases. Such action shall be accredited by a certificate issued by the Corporation. In such case, the interested party must pay into fiscal funds all amounts which he may not have paid by virtue of the tax franchises or subsidies granted under instant decree law or other legal dispositions or regulations, plus adjustments and legal interest

determined by the internal Revenue Service in accordance with the Tax Law. If the resolution of the Corporation rejects all or part of the annulment, the interested party may appeal under the procedure laid down in Article 5.

CHAPTER II

On management plans

ARTICLE 8.- Within one year from the date of the certificate approving the classification as preferentially suitable for forestry of a property, or the publication in the Official Gazette, the owner must present a management plan for the properties to the Corporation, prepared by a forestry engineer or a specialized agronomist.

The management plans may only be modified after presentation to the Corporation of a report prepared by a forestry engineer or a specialized agronomist. Without prejudice to the compliance with the requirements laid down in the regulations the management plan shall contemplate the execution of all afforestation within a period not greater than five years, and reforestation within a period of three years from the date of felling, excepting cases where the Corporation, on the basis of a professional report, may

authorize a longer period.

ARTICLE 9.- Proprietors of lands whose total area is less than 200 hectares, and is without trees, or where the wooded area is not more than 10 hectares, may present management plans for afforestation or reforestation without the obligation that these should be prepared by one of the engineers mentioned in the preceding article, the sole signature of the proprietor being sufficient in such cases, accompanied by a sworn declaration of truth of the information given in the corresponding plan.

For properties located in the regions of Tarapacá, Antofagasta, Atacama, Coquimbo, Aysén, General Carlos Ibáñez del Campo and Magellán, the Chilean antarctic and Continental Chilobé, the area mentioned above shall be extended to 500 hectares.

ARTICLE 10.- The Corporation may raise objections to management plans presented to it, within a period of 120 days after presentation. If this is not done, the plans shall be assumed to be approved, and the respective certificate issued, in accordance with the regulations. If the Corporation should reject the management plan, then the procedure laid down in article 5, shall be followed.

ARTICLE 11.- The Regulations which will be dictated for the application of instant decree law will embody, at least, norms relative to qualification of properties as preferentially suitable for forestry, and management plans.

CHAPTER III

On incentives for forestry

ARTICLE 12.- The State, for a period of 20 years as from the date of promulgation of instant decree law, will subsidize once only for each forestry area included in a management plan, 75% of the net costs of afforestation incurred by individuals or legal persons of any nature, incurred in lands classified as preferentially suitable for forestry, in accordance with the terms of this law. In the same manner, net costs arising from management of the forest resulting from the afore-mentioned afforestation, which have been made in accordance with the terms of the management plan, and the norms laid down in the regulations, will be subsidized. In the case of dunes located in such classified lands, prior stabilization works will also be subsidized.

Subsidies received or earned will be considered as deferred income in current liabilities, and

will not be included in calculating the additional tax of article 21 of the income tax law, nor will they constitute income for any legal purposes until such time as the exploitation or sale of the forest which originated the exploitation, at which time it will be amortized, charging it to the cost of exploitation according to, and in proportion to the exploitation or the sale of the forest, applying article 14, first paragraph, of instant decree law to the resulting profits. For the purposes indicated in the preceding paragraph, subsidies earned or received, considered as deferred income in current liabilities, will be subject to the norms on monetary correction established in the income tax law, and readjusted in the same manner as the costs incurred in the development of the forest plantations included in the assets. The subsidies may be charged and received by persons other than the proprietor, always providing that the forester acquires the title in virtue of which he planted and that furthermore, he proves that the owner has renounced such subsidies in his favour. The President of the Republic, by supreme decree, will establish rules governing the procedure for payment of such subsidies.

ARTICLE 13. — Land classified as preferentially suitable for forestry, natural and artificial forests, and the forestry plantations therein shall be exempt from the land tax applied to agricultural lands, and they shall not be considered for the purposes of presumed income, nor for the calculation of global income tax, or the additional tax, as may be the case. Artificial forest, and the land where they are planted, always provided that they are classified as being preferentially suitable for forestry, shall not be computed for the inheritance, assignments and donations tax. For the purposes of that tax, the growth of natural forest shall not be imputed to the value of the land. The Revenue Service, on the sole presentation of the certificate of classification extended by the Corporation will order the immediate exemption from the taxes mentioned in this article. The corresponding tax exemption shall enter into validity as from the date of the certificate of classification of the land as preferentially suitable for forestry mentioned in the third paragraph of article 4, excepting the land tax, which will become valid as from January 1st. of the year following the

certification. The Revenue Service will be empowered to divide the valuation roll if this were necessary for tax regulation. ARTICLE 14. — Profits deriving from exploitation of natural or artificial forests, and obtained by natural or legal persons will be subject to first category income tax. For the purposes of the global complementary tax, 50% will be deducted from the tax which proportionally affects the income earned or received, arising from the exploitation of the forests to which this article refers. Joint stock companies, or limited companies subject to this decree law will pay the additional tax established under article 21 of the income tax law, reduced by 50%. Shareholders will determine the global complementary tax on profits distributed by such companies, referring to the exploitations mentioned in this article, in accordance with the rules laid down in the preceding paragraph, and must give a credit to such tax of 20% applied over the sums distributed. Income obtained from industrialization of the timber, or other associated industrial activities, will not enjoy the tax franchises established in

this article. ARTICLE 15. — For the purposes of payment of the subsidies mentioned in Article 12, during the month of July each year, the Corporation, subject to approval by the Ministries of Economy, Development and Reconstruction, and Finance, will establish the costs of dune stabilization, plantation and management, per hectare, for the following season according to the various categories of soils, regions, tree or bush species and all other elements which enter into the costs. These values will be adjusted according to variations in the Consumer Price Index determined by the National Statistics Institute between the date of their establishment and that on which the subsidy is effectively collected. If the Corporation fails to establish said costs within the stated period, they will be, for the purposes of calculation and payment of the subsidy established at the values contained in the last table of costs, which will be adjusted in this case, and for those purposes, in the same manner as indicated in the preceding paragraph. ARTICLE 16. — The subsidies mentioned in article 12 will be paid each time the beneficiaries acquire new areas afforested or

management operations included on the management plan, by means of a certificate issued by a forestry engineer or specialized agronomist, subject to prior approval of the Corporation.

CHAPTER IV On penalties

ARTICLE 17. - The following fines are established, which will be applied on the fiscal valuation of the classified land, effective at the time of payment, for failure to present opportunely the management plan mentioned in article 8, and for non-compliance for causes due to the forester or proprietor, as may be the case, of the afforestation programmes determined in the management plans, or reforestation obligations of lands classified as preferentially suitable for forestry.

- a) during the first year: 5%
 - b) during the second year: 10%
 - c) during the third year: 20%
 - d) during the fourth year: 40%
 - e) As from the fifth year: 80%
- Such fines will commence from the time of non-compliance with the reforestation or afforestation programmes contained in the management plan in accordance with the dates therein established, and will be calculated according to the percentage incidence of

non-complied in relation to the total.
The same fines will be applied in the case of non-compliance with dune stabilization works in lands classified as preferentially for forestry, and included in the respective plan.
The fines laid down in this article will not affect lands classified as preferentially forest land when that classification has been made by the Corporation as laid down in article 6, and the latter is not in a position to offer technical and credit assistance of its own, or through other State organizations, for compliance with the respective management plans.

ARTICLE 18. - When the programme of plantations of the management plan has been interrupted, with the lands subject as from that time to the fines mentioned in article 17, the renewal must be approved by the Corporation under the same procedure as the original plan, subject to a report by forestry engineer or qualified agronomist, accompanied by an up-dating of the plan.

The proprietors of lands mentioned in article 9, may request renewal of the plan, duly up-dated, by means of a sworn declaration before a public notary, without the need for a report by

a forestry engineer or qualified agronomist.
ARTICLE 19. - The recommencement and up-dating of the plantation programme contained in the management plan will not produce exemption from payment of fines indicated in article 17, for the period of non-compliance with the plan, which will be suspended as from the date of reception of the report or sworn declaration as may be the case.
If further interruptions arise, the fines will be imposed in the manner indicated in the preceding article, taking as a base the percentage which was being applied at the time of up-dating.

ARTICLE 20. - The non-compliance with management plans for causes due to the forester, always providing that they are not related to plantation programmes, shall be penalized, according to their gravity, with a fine of 10 to 100 legal basic salaries of the Metropolitan Region of Santiago in force at the of application of the fine.
Non-compliance with programmes of protection or exploitation shall be regarded as serious offences for these purposes. Notwithstanding the foregoing, the owners of lands classified as preferentially suitable for forestry who do not comply

with the obligation of executing the management plan, must reimburse the sums referred to in the first paragraph of article 7, in the case of partial non-execution of such plans, the Income Tax Service will determine, collect and receive, subject to a report by the Corporation, such part of the tax franchises or subsidies as must be reimbursed, according to the degree of execution to which such plans may have been subject, and the profit which their partial execution may represent for the purposes of the respective forestry land.
ARTICLE 21. - Any felling or exploitation of forests whether or not carried out in lands classified as preferentially suitable for forestry, may be done only with prior approval of the management plan by the Corporation. Should such felling or exploitation take place in forests whose total area is greater than 10 hectares, the plan must be prepared by a forestry engineer or specialized agronomist whatever may be the area to be felled or exploited.
Contravention of this obligation will make the proprietor or person who carries out the unauthorized felling or exploitation liable to a fine which equals double the commercial value of the products,

as may be determined by the Corporation, regardless of the state or degree of exploitation or industrialization, if such products are in the possession of the transgressor, they will be confiscated.

If the products of the felling or exploitation in contravention of this article have been sold, the transgressor will be fined three times their commercial value. Confiscated products will be sold by the Corporation. Contravention of the terms of the first paragraph will also permit the Corporation to order immediate stoppage of work for which purpose the Corporation may invoke the aid of the police from the competent police court in accordance with the terms of article 24, and the police court will decide to grant or refuse police assistance within 48 hours on the basis of information supplied by the Corporation.

ARTICLE 22. - All felling or exploitation of forest shall oblige the owner of the respective lands to reforest or recover an equal area, at least, to that felled or exploited under the conditions of the plan approved by the Corporation. This obligation may be met in land other than that where the felling or exploitation took place, only when such plan is

approved by the Corporation. Plantations thus made will be considered as reforestation for all legal purposes.

Non-compliance with these obligations within a period of three years after the felling or exploitation will be subject to the fines laid down in article 17, increased by 100%. If the felling or exploitation has taken place in unclassified lands, the fine for not reforesting will be calculated on the proportion of the fiscal valuation of the area felled or exploited. This obligation may be substituted by the recuperation for agricultural purposes of the land subjected to extractive operations, when this course has been included in the management plan.

ARTICLE 23. - Any felling or exploitation in frontier areas must be authorized by the State Bureau of Frontiers and Boundaries. In the case of requests applying to areas bordering on the international frontier, the Bureau must obtain a decision from the Ministry of National Defense.

If, in the opinion of that Ministry, the felling or exploitation would affect national security, the Frontiers Bureau must make its decision in the light of the indications of the Ministry. This authorization must be

requested from the Corporation, which will process it through the Bureau of Frontiers and Boundaries (Dirección de Fronteras y Límites). The decision on this request will not be subject to appeal.

The foregoing is without prejudice to compliance by the interested party with all other requirements contained in instant decree law regarding authorization for felling of exploitation. Whilst the authorization indicated in article 1 is being processed, the periods laid down articles 8 and 10 are understood to be suspended.

ARTICLE 24. The judge of the local police court, if he is a lawyer, with jurisdiction over the district where the infraction has been committed, will be responsible for applying the penalties and fines established in instant decree law, and will hear in first instance the denouncements presented by officials of the Corporation or Carabineros de Chile (Police Force) according to the terms and procedures laid down in Decree 307 of 1978, of the Ministry of Justice, which established the revised, coordinated and systematized text of Law 15.231.

Nevertheless, if the offences were committed in a district which does not have a judge of the local

police court who is a lawyer, they will be resolved by the same procedure by the judge located in the capital of the province.

CHAPTER V General dispositions

ARTICLE 25. - For all taxation purposes relating to instant decree law, and without prejudice to the responsibilities and obligations of private individuals, the Corporation shall, where necessary, make the necessary communications to the Income Tax Service.

ARTICLE 26. - For the purpose of the terms of article 8 of decree law 280 of 1974, State credits granted for the execution of development plans shall be regarded as development credits.

ARTICLE 27. - Mention of lands preferentially suitable for forestry in reforestation agreements between the Corporation and any natural or legal person will have not value for the purposes of instant decree law. Consequently, interested parties must obtain in any case the declaration of lands preferentially suitable for forestry in accordance with the terms of instant decree law.

ARTICLE 28. - Joint stock companies, excepting banks and financial companies, may acquire shares or rights in companies of any type which have

as their principal activity the plantation of exploitation of forests, without legal or regulating limitations.

SECOND ARTICLE.— the following amendments are introduced in the Forestry Law, the text of which was established by decree No 4.363 of 1931, of the Ministry of Lands and Colonization.

a) substitute article 1 by the following:
"ARTICLE 1^o. — All lands which, because of climatic and soil conditions should not be permanently ploughed, whether or not covered by vegetation, excluding those which, without degradation, may be used for agriculture, fruit growing or intensive cattle raising.

Lands defined as preferentially suitable for forestry shall be recognized as such in accordance with the procedure laid down in the decree law on forestry development".

b) Substitute article 2 by the following:

"ARTICLE 2^o. — Lands classified as preferentially suitable for forestry, and natural and artificial forests subject to management plans approved by the Corporation, in accordance with the terms and obligations defined in decree law No 701 of 1974 on forestry development".

c) Annual article 3.

THIRD ARTICLE.— Annual article 27 of Law No 16.640 and decree No 275 of July 1969, of the Ministry of Agriculture, which covered the regulations of the previous law.

FOURTH ARTICLE.— Abrogate in full the mortgages constituted under article 12 of the old text of decree law No 701 of 1974, which became article 11 under the terms of decree law No 945 of 1975.

The conservators of Real Estate will proceed to cancel the inscriptions which may have been made under said dispositions, officially or at the request of the interested parties.

FIFTH ARTICLE.— The President of the Republic is authorized to establish within 180 days after the publication of this decree law, accounting methods and simplified methods for registration and determination of the income deriving from the exploitation of forests, for all taxpayers subject to the terms of decree law No 701 of 1974,

substituted by article 1 of instant decree law, or decree No 4.363 of 1931 of the Ministry of Lands and Colonization, and who are not obliged to keep books in accordance with the terms of the income tax law.

of the income tax law.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

TEMPORARY ARTICLES

ARTICLE 1^o.— Owners of lands preferentially suitable for forestry may obtain the benefits of decree law No 701 of 1974, substituted by the first article of instant decree, meeting its requirements, always providing that they can accredit the requirements of decree with force of law

No 6 of 1968, of the Ministry of Agriculture, or the norms which modify or replace it, and have presented their request for proving of ownership titles over the respective real estate, which must be proven by means of a certificate of the Department of Titles of the Ministry of Lands and Colonization.

Persons conforming to these conditions may receive the subsidies referred to in article 12 of the mentioned decree law.

ARTICLE 2^o.— Until such time as regulations are dictated on articles 11 and 12 of decree law 701, substituted by article 1 of instant decree law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

ARTICLE 3^o.— the franchises of article 3 of decree No 4.363 of 1931, of Lands and Colonization, notwithstanding the repeal indicated in the second article of

instant decree law, will continue to be valid until the expiry of their respective periods for plantations existing on 28 October 1974.

For these purposes, and in respect of plantations existing on the date mentioned, a period of one year is granted as from the date of publication of instant decree to commence or continue proceedings established in said article 3 with modifications to the effect that the declaration of lands preferentially suitable for forestation and the certification of the age of the plantations are made by the Corporation, and that the period indicated in the first paragraph for these purposes shall be only 25 years.

ARTICLE 4^o.— Notwithstanding the terms of paragraphs three and four of article 12 of decree law 701 of 1974, substituted by the first article of instant decree law, subsidies received since 28 October 1974, and those to be received until 15 March 1984, will not be considered in calculating the additional tax of article 21 of the income tax law whatever be the date of exploitation or sale of the forest concerned.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

instant decree law, will continue to be valid until the expiry of their respective periods for plantations existing on 28 October 1974.

For these purposes, and in respect of plantations existing on the date mentioned, a period of one year is granted as from the date of publication of instant decree to commence or continue proceedings established in said article 3 with modifications to the effect that the declaration of lands preferentially suitable for forestation and the certification of the age of the plantations are made by the Corporation, and that the period indicated in the first paragraph for these purposes shall be only 25 years.

ARTICLE 4^o.— Notwithstanding the terms of paragraphs three and four of article 12 of decree law 701 of 1974, substituted by the first article of instant decree law, subsidies received since 28 October 1974, and those to be received until 15 March 1984, will not be considered in calculating the additional tax of article 21 of the income tax law whatever be the date of exploitation or sale of the forest concerned.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

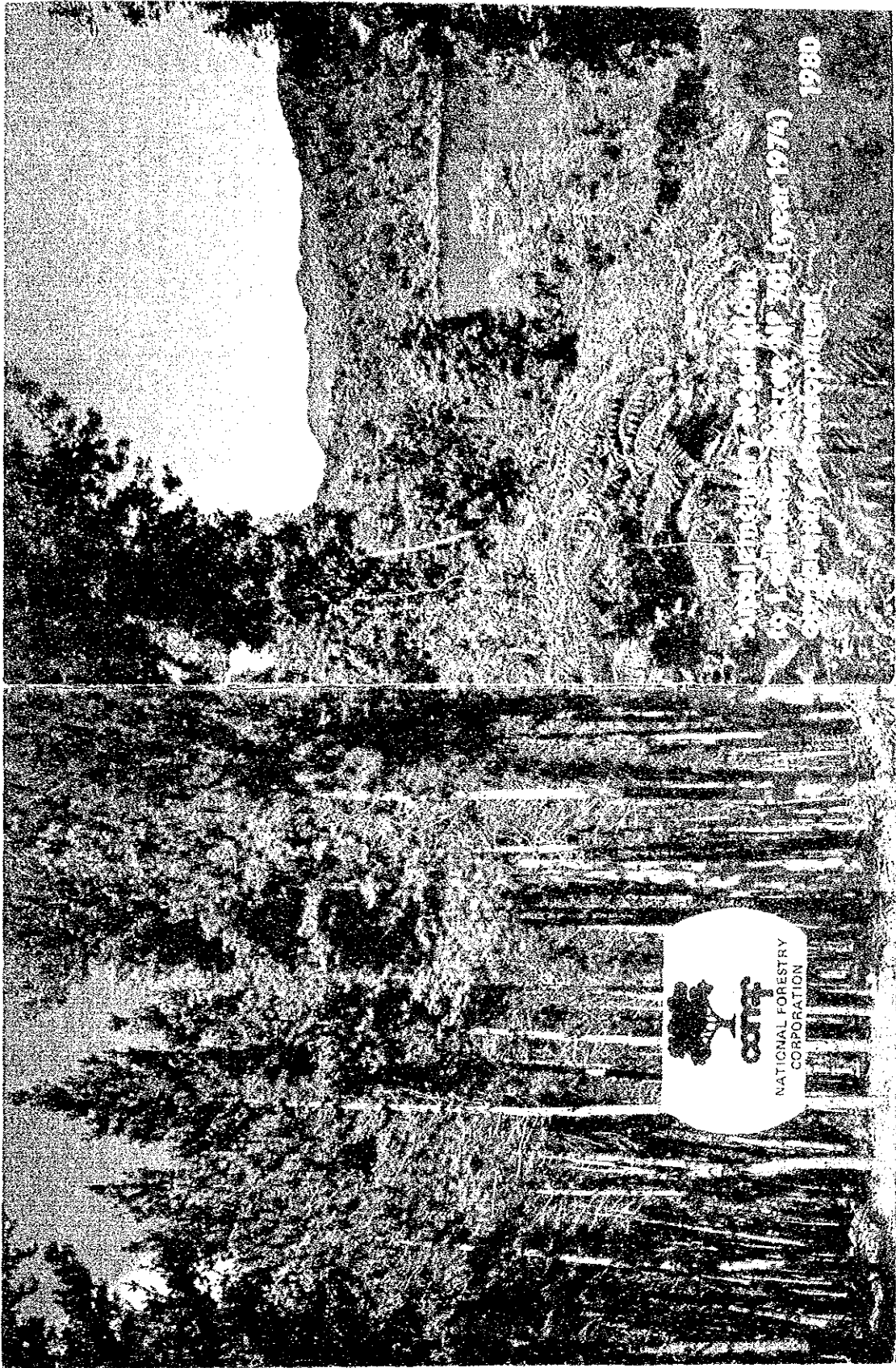
of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.

of the income tax law, all the terms of decree 346 of 1974, of Ministry of Agriculture, and 953 of 1975 of the Treasury, which are not contrary to that decree, will remain in force.



**Supplementary Regulations
to Legislative Decree № 701 (year 1974)
on Forestry Development**

**SUPPLEMENTARY REGULATIONS TO LEGISLATIVE DECREE
 No 701 (YEAR 1974) ON FORESTRY DEVELOPMENT
 REGULATIONS FOR THE APPLICATION OF LEGISLATIVE
 DECREE No 701 CONCERNING FORESTRY DEVELOPMENT,
 AS ESTABLISHED BY THE MINISTRY OF AGRICULTURE
 IN DECREE No 259 (YEAR 1980) PUBLISHED
 IN OFFICIAL GAZETTE No 30803 DATED 30 OCTOBER 1980
 AND INCLUDING SUBSEQUENT AMENDMENTS
 AS PUBLISHED IN OFFICIAL GAZETTE No 30819
 OF 19 NOVEMBER 1980**

No 259, Santiago, 1 September 1980

In view of: The provisions contained in Article 11 of Legislative Decree No 701 of 1974, the amended text of which was established in Article 1 of legislative Decree No 2565 of 1979; the provisions of Decree with Force of Law No 294 of 1960 concerning the organic establishment of the Ministry of Agriculture; and the terms of Legislative Decrees Nos. 1 and 128 of 1973 and Nos. 527 and 806 of 1974.

The following is hereby decreed:

PRELIMINARY TITLE:

Definitions:

ARTICLE 1: For the purpose of the present Regulations the following terms will be interpreted in the manner described:
 a) The Legislative Decree: refers to Legislative Decree No 701 of 1974 the original text of which was amended by Article 1 of Legislative Decree No 2565 dated 21 March 1979 published in the Official Gazette of 3 April of the same year.
 b) Felling or exploitation: the act

of cutting down or extracting one or more specimens or individual examples of tree or shrub species which, growing in rural locations, constitute part of a forest.
 c) Rural property: any real property or land area suitable for agricultural use, livestock-raising or forestry.
 d) Native forest: a forest made up of autochthonous species and which may form differing forest types.
 e) Forest type: a group of trees growing in a given area characterized by certain predominant species in the upper strata or because these trees attain a minimum specified height.
 f) Stand: a group of trees which, occupying a particular land area, is sufficiently uniform in species, age, quality or condition, to distinguish it from the surrounding forest.
 g) Rotation: the number of years elapsing between the establishment of a forest and its felling or exploitation.
 h) Basal area: the sum of all transverse sections of the trees growing in a hectare, measured at a height of 1.30 metres above ground and expressed in square metres.

TITLE 1:

Concerning the classification of land areas which are primarily suited to forestry and of the management plan.

1.- Concerning the petition and technical studies.
ARTICLE 2: Owners wishing to obtain certification of lands as primarily suited to forestry or approval of a management plan should present the relevant petition at the office of the National Forestry Corporation which corresponds to the location of the property, using for the purpose forms provided by the said Corporation.

ARTICLE 3: The petition requesting classification of land as primarily suited to forestry or seeking approval to a management plan should contain particulars of the owner and the property, the owner's signature or that of his legal representative, and should be accompanied by the following documents:

a) A copy of the official registration of ownership together with a certificate of validity, or a certificate issued by the Ministry of National Properties in the event that the owner has initiated actions to obtain clear title to the property.
 b) A certificate regarding the number of the property for real-estate tax purposes showing,

where pertinent, the land use classification of the property.
 c) A petition to enable the Corporation to obtain approval from the Directorate of Frontiers, if required.
 d) A certificate issued by the corresponding University, confirming the holding of a professional degree by the forestry or agricultural engineer responsible for the technical study; and a certificate of specialization in forestry matters if relevant.
 e) Three copies of a technical study classifying the land as primarily suited to forestry, or of a management plan as the case may be, drawn up on forms provided by the Corporation, except in those cases where the owner makes use of the option referred to in Article 13 of the present Regulations.
 f) A plan or sketch of the property in accordance with Article 6 of the present Regulations.
 The owner shall include in his petition a sworn statement to the effect that the information submitted is accurate.
 Incomplete or amended petitions or those not enclosing the aforementioned particulars shall not be admitted for consideration by the Corporation. The latter shall be required, at the request of the applicant, to issue a certificate stating the causes of rejection.
 The domicile of the owner shall be understood for all legal purposes to

be that shown on the corresponding petition.

ARTICLE 4: The technical study supporting the classification of the land as primarily suited to forestry and the management plan shall be drawn up by a forestry engineer or specialized agricultural engineer and shall be signed by one of them and by the owner of the property. In the case of studies for the classification of land as primarily suited to forestry the submission of proof of his qualifications by the engineer concerned shall suffice for him to be accepted as a specialist agricultural engineer. In the case of technical studies relating to management plans and certifications he will additionally be required to submit proof by means of a University certificate of having received training in forestry matters.

Forestry engineers or specialist agricultural engineers subscribing technical studies or certifications relating to the legislative decree shall be held responsible for the veracity of the particulars or facts declared therein.

ARTICLE 5: Notwithstanding

the preceding Article, the management plan may be drawn up and signed solely by the owner of the property in the following instances:

a) When the main purpose of the management plan is the afforestation or reforestation of

properties not exceeding 200 hectares in total area and where arboreal vegetation is either absent or covers not more than 10 hectares. The abovementioned area of 200 hectares shall be extended to 500 hectares for properties situated in the Regions of Tarapacá,

Antofagasta, Atacama, Coquimbo, Aysen General Carlos Ibañez del Campo, Magallanes and the Chilean Antarctic, and in the Province of Palena (formerly Chiloé Continental).

b) When the object of the management plan is the felling or exploitation of forests with a total area of 10 hectares or less. In both the foregoing instances the owner shall include a sworn statement regarding the accuracy of the particulars submitted.

ARTICLE 6: Considering Article referred to in the preceding Article and in those cases in which the technical studies or work to be carried out do not qualify for payment of subsidy or tax exemptions, only a general sketch of the location of the property shall be required, showing its boundaries and the approximate area, both of the property as a whole and of the part subject to the management plan.

In all other instances a plan shall be required, showing the location, area and boundaries of the property, the exact area qualifying for the aforementioned benefits and an

explanation of the symbols used.

ARTICLE 7: The Corporation shall have a period of 60 consecutive days in which to decide on a petition for the classification of land as primarily suited to forestry, and 120 consecutive days to decide on a request for approval of a management plan, reckoned in both cases from the date of receipt of the petition at the corresponding office.

In the absence of a decision by the Corporation within the periods mentioned, the classification or management programme as proposed by the applicant shall be considered as approved. In either case the Corporation must issue the corresponding certificate.

ARTICLE 8: When the matter concerns the qualification of unclassified land or the re-classification of land already assessed by the National Natural Resources Research Institute (IREN-CORFO), the technical study for the classification of land as primarily suited to forestry should contain the following particulars:

a) Number of the petition for the classification of land as primarily suited to forestry.
b) Information on soil conditions: area by land use classes primarily suited to forestry according to the author of the study, and, in addition, according to the National

Natural Resources Research Institute in cases of reclassification, current description of the areas to be classified showing symbols for soil series and limiting factors in accordance with the nomenclature employed by the National Natural Resources Research Institute;
c) Classification proposed and its corresponding justification.

In these cases a plan should be attached which, in addition to providing the information called for in paragraph 2 of Article 6 of the present Regulations, should show the limits of land use capacity of the areas primarily suited to forestry, according to the National Natural Resources Research Institute and/or according to the author of the technical study.

In cases involving the qualification of lands already classified by the National Natural Resources Research Institute, the technical study referred to in Article 4 of the present Regulations should only be accompanied by the valuation certificate of the Internal Revenue Service stating the soil classification carried out by the aforementioned Institute, the classification proposed, and a plan of the property as described in paragraph 2 of Article 6 of the present Regulations.

ARTICLE 9: Within a period of one year reckoned from the date of certificate approving the

classification of a land area as primarily suited to forestry, or from its publication in the Official Gazette in those cases where the Corporation has made use of its right under Article 6 of the legislative decree, the owner should submit a management plan to the Corporation for the area concerned.

ARTICLE 10: According to the nature of the operations to be carried out by the interested parties or those which they should fulfil under law, the management plan should cover one or more of the following programmes: stabilization and afforestation of dunes; afforestation; improvement; forest felling or exploitation and reafforestation. To each should be appended a corresponding protection programme.

ARTICLE 11: The programmes should comply with the technical requirements laid down for each by the Corporation and should include the following minimum particulars:

- a) Number of the petition certificate in the case of land already classified.
- c) Area affected by the programme, duly shown on a plan or sketch of the property, as may be appropriate, and
- d) Description of the activities comprising the programme, with an annual schedule for their

execution. The latter will not be required in the case of protection programmes.

ARTICLE 12: The period of development and execution of afforestation and dune stabilization and afforestation programmes shall not exceed five years reckoned from the date of the certificate of approval of the classification of the land as primarily suited to forestry unless for justifiable technical reasons the Corporation were to authorize an extension of this period. This however may not exceed a further period of two years. All programmes submitted to the Corporation should include a protection programme. The latter should describe the measures that the owner binds himself to adopt to prevent and combat forest fires, forest pests or diseases and harmful fauna. Such measures shall remain permanently valid and updated at all times.

The improvement programme shall be compulsory when the intention is to carry out a pruning operation and to apply for a subsidy for its cost.

Whether or not the land area concerned has been officially classified as primarily suited to forestry the forest felling or exploitation and reafforestation programme shall require the prior approval of the Corporation before it is put into execution.

ARTICLE 13: Acting through its

forestry engineers or specialized agricultural engineers, the Corporation may establish management standards for general application for certain species in designated regions or sectors. Within the period established in Article 9 of the present Regulations, and before starting work under programmes of improvement or of felling or exploitation referred to in Article 21 of the legislative decree, owners intending to adopt the aforementioned general management standards should submit a petition in the manner mentioned and providing the particulars called for in Article 3 of the present Regulations with the exception of those referred to in items d) and e) of the said article, specifying the area and species or forest types to which the said standards are to apply. In this event the obligation to submit a management plan under the terms of the legislative decree shall be regarded as fulfilled once the petition has been approved by the Corporation. Owners making use of the right accorded them under the present Article need only include in their programmes as referred to in Article 10 of the present Regulations a specification of the operations to be carried out in accordance with forms to be provided for the purpose by the Corporation.

ARTICLE 14: The management

plan may only be altered after submission of a report drawn up by a forestry engineer or a specialized agricultural engineer and its approval by the Corporation at the same time observing that the document may be presented solely by the owner in the case referred to in Article 5 of the present Regulations or in case the owner notifies the Corporation of his intention to apply the general management standards referred to in the preceding article.

ARTICLE 15: If the Corporation denies either totally or in part the request for approval of a management plan, the applicant may appeal in the manner, period and conditions described in Article 5 of the legislative decree.

ARTICLE 16: All forest felling or exploitation operations shall oblige the owner of the land area concerned to reforest it or an area of land of at least the same size as that felled or exploited in accordance with the corresponding conditions stated in the management plan and approved by the Corporation. The period in which such reforestation is carried out may not exceed three years reckoned from the date of felling or exploitation unless the Corporation, for duly justifiable technical reasons were to authorize an extension of the period, in which event this may not exceed a further period of one year.

The aforementioned obligation may be fulfilled on an area different from that where the felling or exploitation was carried out only if specified in management plan approved by the Corporation. The obligation to reforest may be substituted by the conversion of the cutover area to agricultural uses only if the change in land soil and has been included in the management plan.

2.- Specific provisions relating to management plans for the native forest.

ARTICLE 17: A management plan for an area of native forest shall be subject to the general conditions of the present Regulations without detriment to the validity of the provisions established in the following articles. The latter shall prevail over the former in the event of any contradiction.

ARTICLE 18: For the purpose of ensuring the regeneration of the native forest, the following methods or felling or exploitation are recognized:

- a) Clearcutting: namely the cutting down in one operating season of all the trees in the defined area of a stand.
- b) Seed tree cutting method: the felling in one operating season of all the trees of a stand except those left for seeding purposes to repopulate the area, these being of the species it is intended to

regenerate.

- c) Shelterwood cutting: gradual exploitation of a stand in a series of partial felling operations with the aim of establishing an even aged stand of natural regeneration under the protection of the old stand.

d) Selection cutting: the extraction of individual trees or of small groups thereof in areas not exceeding 0.3 hectares, in which event a wooded strip at least 50 metres in width should be left surrounding the area of extraction.

When the forest concerned is on sloping land with a gradient of more than 45o/o, neither the clear felling nor the seed-tree method may be employed. Where the gradient is between 30o/o and 45o/o and the clear cutting or seed-tree method is applied, the areas cut may not be greater than 20 hectares and a wooded strip at least 100 metres in width shall be left between the cut areas. In those cases where the gradient exceeds 60o/o, only the selection method of felling or extraction may be used.

ARTICLE 19: To determine the method of felling or exploitation of the native forest, the following forest types are recognized:

- a) Alerce (*Fitzroya cupressoides*): An association of trees or shrubs containing at least one specimen of this species per hectare.
- b) Araucaria (*Araucaria araucana*):

An association of trees or shrubs containing at least one specimen of this species per hectare.

- c) Ciprés de la Cordillera (*Austrocedrus chilensis*): That forest type which contains at least 40 specimens of the species per hectare each being 2 metres or more in height and growing either alone or together with other species.

d) Ciprés de las Guaitecas (*Pilgerodendron uviferum*): That forest type in which this species is growing either alone or in association with others and where there are at least 10 specimens of the species per hectare, more than 2 metres in height.

e) Coigue de Magallanes (*Nothofagus betuloides*): That forest type in which this species is growing either alone or in association with other species in the proportion of at least 50o/o of the total number of tree per hectare.

f) Coigue - Rauli - Tepa (*Nothofagus dombeyi*, *Nothofagus alpina*, *Laurelia philippiana*): That forest type containing any combination of these species, except where either of the first two represents more than 50o/o of the total number of specimens per hectare.

g) Lenga (*Nothofagus pumilio*): That forest type in which this species is growing exclusively or in

association with other species but at least 50o/o of the total number of trees per hectare are Lenga.

- h) Roble - Rauli - Coigue (*Nothofagus obliqua*, *Nothofagus alpina*, *Nothofagus dombeyi*):

That forest type which contains any of these 3 species or a combination of them in which the combination or the presence of any of them constitutes more than 50o/o of the trees per hectare having minimum diameter of 10 centimetres at a height of 1.3 metres above ground level.

i) Roble - Hualo (*Nothofagus obliqua*, *Nothofagus glauca*): That type in which one or both species is present and constitute a minimum of 50o/o of the trees per hectare.

j) Evergreen (*Siempreverde*): That type which contains an association of the the following species in its upper or medium strata: Coigue (*Nothofagus dombeyi*), Coigue de Chiloé

(*Nothofagus nitida*), Coigue de Magallanes (*Nothofagus betuloides*), Ulmo (*Eucryphia cordifolia*), Fineso (*Weinmannia trichosperma*), Tepa (*Laurelia philippiana*), Olivillo (*Aextoxicon punctatum*), Canelo (*Drymis winteri*), Mañío de hojas punzantes (*Podocarpus nubigenus*), Mañío de hojas cortas (*Saxegothaea conspicua*), Luma (*Ammomyrtus luma*), Meli (*Ammomyrtus meli*), and Pitra (*Myrceugenia plantipes*).

k) Schlerophyllous (Esclerófilo): That forest type which contains at least one of the following species or some of them in association: Quillay (Quillaja saponaria), Litre (Lithraea caustica), Peumo (Cryptocaria alba), Espino (Acacia caven), Maitén (Maytenus boaria), Algarrobo (Prosopis chilensis), Bello (Bailechmidia miersii), Boldo (Peumus boldus), Bollen (Kageneckia oblonga), Molle (Schinus latifolius), and others of similar geographic distribution.

l) Palma chilena (Jubaea chilensis): That forest type containing one or more specimens of this species per hectare.

ARTICLE 20: The landowner within whose property the felling or exploitation of a native forest area takes place must apply the methods intended to establish regeneration of the number of plants specified in the following articles as soon as the trees or shrubs have been felled or exploited. In all cases reforestation of the native forest should be carried out within a period of 3 years reckoned from the date of felling or exploitation unless, in the light of the corresponding technical study, the Corporation were to authorise a longer period for the purpose.

ARTICLE 21: The clear cutting method shall be applicable to the forest types designated as Roble - Hualo (Nothofagus obliqua -

Rauli - Coigue (Nothofagus obliqua - Nothofagus alpina - Nothofagus dombeyi). In this case a minimum number of 3000 evenly distributed plants of the same species per hectare should be established.

ARTICLE 22: The seed tree method of cutting or exploitation shall be applicable to the forest types designated as Roble - Hualo (Nothofagus obliqua - Nothofagus glauca), Roble - Rauli - Coigue (Nothofagus obliqua - Nothofagus alpina - Nothofagus dombeyi), and Coigue - Rauli - Tepa (Nothofagus dombeyi - Nothofagus alpina - Laurelia philippiana). In this case a minimum number of 10 seed trees should be left per hectare and remain standing until such time as a minimum number of 3000 plants of the same species, evenly distributed, has become established.

ARTICLE 23: The shelterwood method of cutting or exploitation shall be applicable to the following forest types: Roble - Hualo (Nothofagus obliqua - Nothofagus glauca), Roble - Rauli - Coigue (Nothofagus obliqua - Nothofagus alpina - Nothofagus dombeyi), Lengua (Nothofagus pumilio), Ciprés de la Cordillera (Austrocedrus chilensis), Esclerófilo (sclerophyllous), Siempreverde (Evergreen), Coigue de Magallanes (Nothofagus betuloides), and Coigue - Rauli - Tepa (Nothofagus dombeyi - Nothofagus alpina -

Laurelia philippiana). The owner should establish a minimum number of 3000 evenly distributed seedlings per hectare of the same species as found in the type felled.

ARTICLE 24: The selection method of cutting shall be applicable to the following types: Palma (Jubaea chilensis); Coigue - Rauli - Tepa (Nothofagus dombeyi - Nothofagus alpina - Laurelia philippiana); Ciprés de las Guaitecas (Pilgerodendron uvifera), Coigue de Magallanes (Nothofagus betuloides), Siempreverde (Evergreen); and Esclerófilo (Sclerophyllous); Roble - Hualo (Nothofagus obliqua - Nothofagus glauca); Ciprés de la Cordillera (Austrocedrus chilensis); Lengua (Nothofagus pumilio), and Roble - Rauli - Coigue (Nothofagus obliqua - Nothofagus alpina - Nothofagus dombeyi). In using this method only 35% of the basal area of the stand may be extracted. A minimum of 10 plants of the same species as felled should be established for each specimen extracted, or 3000 plants per hectare of the corresponding type - evenly distributed in both instances. A further selection cutting in the same stand may be carried out only after a 5-year period has elapsed following the preceding operation.

ARTICLE 25: In the case of properties where it is desired to apply silvicultural methods different from those described above, the corresponding felling or

extraction and reforestation programme should be submitted for approval to the Corporation with a clear and precise description of the alternative to be applied and of the proposed manner to obtain regeneration of the felled area. In this event the Corporation will approve or reject the proposal depending upon the technical feasibility of ensuring the regeneration of the species using the intended method and the lesser or greater risk of erosion that it may imply.

The processing of the petition will be subject to the general rules concerning management plans as established in the present Regulations.

ARTICLE 26: For the purpose of fulfilling the reforestation requirement, a given species may be substituted by another, either indigenous or introduced, subject to the prior consent of the Corporation except when the owner makes use of the right referred to in the first paragraph of Article 13.

The corresponding justification should be based on information substantiated experimentally that the species to be introduced is adapted to the site and further, that soil erosion is not thereby caused.

ARTICLE 27: The technical study supporting the native forest felling or exploitation and reforestation

programme should include: the number of the petition, number of the classification certificate when appropriate, specification of the land area to be felled or extracted, forest type, species involved, number of trees or basal area to be left, method of felling or exploitation and annual felling or exploitation schedule, area to be reforested, species density expressed in number of trees per hectare, annual reforestation schedule and a sketch or plan showing: the limits of the property, internal road network, location of the property, limits and area per stand to be felled or exploited and reforested.

ARTICLE 28: The protection programme and corresponding technical study shall be subject to the provisions of Articles 11 and 12 of these Regulations.
In all cases mention should be included of the necessary measures for the exclusion of livestock, the treatment of residual materials remaining after the exploitation, fire prevention, and the gradient of roads to be built which in no case shall exceed 150/o.

ARTICLE 29: The Corporation shall make available to interested parties an informative guide on the subject of "silvicultural methods for the regeneration of the native forest".

ARTICLE 30: The forest types designated as Alerce (Fitzroya

cupressoides) and Araucaria (Araucaria araucana) shall continue to be subject to the terms of Decrees Nos 29 of 9 February 1976 and 490 of 1 October 1976, both of the Ministry of Agriculture.

TITLE II:

Of the Juridical Procedure:

ARTICLE 31. The application of penalties or fines as established in Legislative Decree No 701 shall be the responsibility of the local police magistrate, being an attorney and holding jurisdiction in the commune in which the infraction has occurred, in accordance with the terms and procedures established in Article 24 of the aforementioned legislative decree.

In the event that the property where an infraction has occurred lies in more than one commune the local police magistrate of any of the communes concerned shall be competent to act. Infractions occurring in a commune not possessing a local police magistrate qualified as an attorney shall be dealt with by the corresponding magistrate in the capital city of the Province.

ARTICLE 32. The magistrate shall proceed in accordance with Article 20 and other relevant provisions of Supreme Decree No 307, of 1978,

issued by the Ministry of Justice and containing the consolidated, co-ordinated and systematized text of Law No 15.231.

ARTICLE 33. The police and officials of the Corporation responsible for supervising compliance with the terms of Legislative Decree No 701 concerning Forestry Development and its supplementary regulations, on discovering any infraction of the said terms shall report it to the Court of the corresponding local police magistrate and summon the accused personally, if present, or in writing if absent, by means of a note left in a visible place at his domicile or at the site of discovery of the infraction ordering him to appear at the next hearing of the Court, stating the corresponding date and time, and cautioning him regarding further proceedings in the event of disobedience. A copy of the summons should be attached to the accusation stating whether issued personally or in writing. In the latter event and of non-appearance by the accused at Court, the magistrate shall order that he be summoned personally or by official notification delivered at the accused's address as recorded at the Corporation even if he is not domiciled there, in the event of the accused having no recorded address at the Corporation and not being found on two different

days at his place of habitation or of normal conduct of his business, profession or employment, the official entrusted with the notification shall deliver the aforementioned copy to any adult person at that place or shall affix it to the door thereof after ascertaining that the person to be notified is available in the area and that it is his abode or place of business, recording the action taken in the documents relating to the case. Delivery of the aforementioned copy shall be made without need of prior order by the magistrate. The notification mentioned in the two preceding paragraphs shall be delivered by a member of the relevant police unit acting in the capacity of an official attester.

In pursuance of their supervisory duties the officials of the Corporation may enter the premises involved in order to obtain evidence of the alleged infractions and may furthermore call on the assistance of the constabulary via the competent local police court for the purposes described in paragraph 5 of Article 21 of Legislative Decree No 701. The court shall decide on the granting or denial of the requested assistance within a period of 48 hours on the basis of information provided by the Corporation.

ARTICLE 34: When the reported

infraction concerns felling or exploitation without prior approval of a management plan by the Corporation, the supervisory official or officials at the time of issuing the summons should leave on record in the form of minutes the species illegally exploited felled, the quantity or measurement involved, the state or extent of exploitation or processing, and an approximate assessment of the commercial value of the products concerned. The aforementioned minutes should be drawn up in triplicate and signed by the person summoned and by the inspecting official. In the event of the former being unable or unwilling to sign, the fact should be recorded. One copy shall be delivered to the accused, another remaining in the hands of the Corporation and the third being sent to the competent Court together with the corresponding accusation.

ARTICLE 35: Local magistrates may call on the police or the Corporation to provide any required information.

ARTICLE 36: In addition to the conditions laid down in Article 22 of the law governing the Organization and Duties of Local Police Courts, any condemnatory sentence enforcing the confiscation of the goods referred to should order that they be placed at the disposal of the Corporation to

enable the latter to proceed with their disposal.
ARTICLE 37: Disposal of the confiscated goods should be carried out by means of public auction at a place, date and time to be fixed by the Corporation.
The proceeds of the auction shall become the property of the Corporation, which in turn shall defray the corresponding costs.

TITLE III

General Provisions

ARTICLE 38: The Corporation should control the fulfilment of management plans and compliance with the provisions of Legislative Decree No 701 concerning Forestry Development and its supplementary Regulations.

ARTICLE 39: Once the classification petition relating to areas primarily suited to forestry and the corresponding management plan have been approved, the owner of the property or whomsoever may succeed him as owner thereof under any form of title, shall remain obliged to fulfil the requirements laid down in Legislative Decree No 701 concerning Forestry Development and its supplementary Regulations. Those interested in acquiring rural

properties may request from the Corporation certificates declaring whether or not such properties are subject to the terms of Legislative Decree No 701. Such certificates should be issued within a period of 15 days reckoned from the date of request.

ARTICLE 40: Supreme Decrees Nos. 537 of 12 November 1968 and 346 of 26 December 1974, both issued by the Ministry of Agriculture, are hereby abrogated.

TRANSITORY ARTICLE:
Landowners, having obtained classification of their properties as primarily suited to forestry in accordance with the provisions of Legislative Decree No 701 and subsequently making use of the right accorded them under Transitory Article 3 of Legislative Decree No 2565, of 1979 to obtain for their plantations the benefits established in Article 3 of Lands

and Colonization Decree No 4363 of 1931 shall continue to be entitled to those benefits until the termination of their corresponding periods of validity. On expiration of the corresponding period, such properties shall remain subject to the aforementioned Legislative Decree No 701 concerning Forestry Development, and as from that date all the provisions of the said Legislative Decree No 701 shall be applicable to them.

To be registered, communicated and published (Signed) **AUGUSTO PINOCHET** U. General of the Army, President of the Republic.—
Alfonso Marquez de la Plata Y. Minister of Agriculture.—
Monica Madariaga, Minister of Justice.—
Raul Benavides Lieutenant General, Minister of National Defense.
Transcribed to you for information.
With regards.— Jose Luis Toro:
Undersecretary for Agriculture

4 - 3 関係機関略語

組織および機関

| | | |
|----------|---|-------------|
| BCC | Banco Central de Chile | チリ中央銀行 |
| CIREN | Centro de información de Recursos Naturales | 天然資源情報センター |
| CNR | Comisión Nacional de Riego | 国家かんがい委員会 |
| CONICYT | Comisión Nacional de Investigaciones Científicas y Tecnológicas | 国家科学技術研究委員会 |
| COPAGRO | Confederación Nacional de Cooperativas del Agro | 農業共同連合 |
| CONAF | Corporación Nacional Forestal | 森林公社 |
| CORA | Corporación de Reforma Agraria | 土地改良公社 |
| CORFO | Corporación de Fomento de la Producción | 産業開発公団 |
| DGA | Dirección General de Aguas | 水資源局 |
| DIPROREN | División de Protección de Recursos Naturales | 天然資源保護局 |
| DR | Dirección de Riego | かんがい局 |
| EEC | European Economic Community | 欧州経済共同体 |
| EMOS | Empresa Metropolitana de Obras Sanitarias | 首都圏下水道会社 |
| ENAMI | Empresa Nacional de Minería | 国立鉱山会社 |
| ENAP | Empresa Nacional del Petróleo | 国立石油会社 |
| ENDESA | Empresa Nacional de Electricidad S.A. | 国家電力会社 |
| FACHI | Fuerza Aérea de Chile | チリ空軍 |
| FAO | Food Agriculture Organization of the United Nations | 国連食糧農業機関 |
| FIA | Fundación para la Investigación Agrícola y Ganadería | 農畜産研究基金 |
| IBRD | International Bank for Reconstruction and Development | 国際復興開発銀行 |
| IDB | Inter-American Development Bank | 米州開発銀行 |

| | | |
|----------|--|-----------|
| IDIEM | Instituto de Investigaciones y Ensayos de Materiales | 資材研究試験場 |
| IGM | Instituto Geográfico Militar | 軍地理院 |
| IMF | International Monetary Fund | 国際通貨基金 |
| INACAP | Instituto Nacional de Capacitación Profesional | 専門教育研究所 |
| INDAP | Instituto de Desarrollo Agropecuario | 農畜産開発研究所 |
| INE | Instituto Nacional de Estadísticas | 国家統計局 |
| INH | Instituto Nacional Hidráulico | 水理研究所 |
| INIA | Instituto Nacional de Investigaciones Agropecuarias | 農畜産試験場 |
| INN | Instituto Nacional de Normalización | 国家基準局 |
| IRM | Intendencia Región Metropolitana | 首都圏庁 |
| ISP | Instituto de Salud Pública de Chile | チリ公衆衛生研究所 |
| JICA | Japan International Cooperation Agency | 国際協力事業団 |
| LAIA | Latin American Integration Association | 中南米統合連合 |
| MINVIU | Ministerio de Vivienda y Urbanismo | 住宅・都市省 |
| MA | Ministerio de Agricultura | 農業省 |
| MBN | Ministerio de Bienes Nacionales | 国土省 |
| MOP | Ministerio de Obras Públicas | 公共事業省 |
| NASA | National Aeronautics and Space Administration | 国家航空宇宙局 |
| ODEPA | Oficina de Planificación Agrícola | 農業企画局 |
| ODEPLAN | Oficina de Planificación Nacional | 国家企画局 |
| OECF | Overseas Economic Cooperation Fund of Japan | 海外経済協力基金 |
| ONEMI | Oficina Nacional de Emergencia | 国家緊急災害事務局 |
| PROCHILE | Dirección de Promoción de Exportaciones | 輸出振興委員会 |
| SAF | Servicio Aerofotogramétrico | 空中写真サービス |
| SAG | Servicio Agrícola y Ganadero | 農畜産サービス |
| SEREMI | Secretaría Regional Ministerial | 地域省庁 |