

## PROJEKTFORTSCHRITTSBERICHT

**Bericht-Nr.:** 6  
**Berichtszeitraum:** 1.2.1992 - -31.7.1992  
**Berichterstatter:** Dr. Arnim Bonnemann

**Projekt-Nr.:** 89.2022.5-01.100  
**Partnerland:** Costa Rica (Überregional)  
**Projektbezeichnung:** Agroforstliche Zusammenarbeit mit dem CATIE, C.R.

Turrialba, 31.7.1992

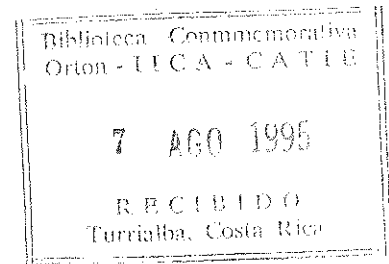
Ort, Datum

Unterschrift Ansprechpartner

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Projektnummer:



**Projektfortschrittsbericht**  
über die Durchführung des Vorhabens

	Seite
<b>1. Auftrags- und problemorientierte Zusammenfassung des Projektfortschrittsberichts</b>	<b>1</b>
<b>2. Im Berichtszeitraum erbrachte Leistungen</b>	<b>2</b>
2.1 Personalaufwand der GTZ und des Trägers	3
2.2 Materialeinsatz, Betriebs- und Unterhaltungskosten und Baumaßnahmen (GTZ, Träger und Dritte)	13
2.3 Aus- und Fortbildung von Partnerfachkräften	14
2.4 Zuschußzahlungen an einheimische Fachkräfte des Trägers	14
2.5 Von der GTZ übernommene bzw. aus Projektmitteln vorfinanzierte Leistungen des Partners	15
2.6 Einsatz von Eigenmitteln der GTZ im Projektumfeld	16
2.7 Übereinstimmung der Leistungen der GTZ mit dem verbindlichen Rahmen des Auftrags	19
<b>3. Darstellung und Bewertung der Ergebnisse im Berichtszeitraum einschließlich eventueller Abweichungen von den Planungsvorgaben</b>	<b>19</b>
3.1 Indikatoren und wesentliche Aktivitäten pro Ergebnis	19
3.2 Annahmen, Risiken und wesentliche äußere Einflüsse pro Ergebnis	19
3.3 Bericht über die Durchführung der Aktivitäten pro Ergebnis Wertung des Ergebnisses nach fachlichen, wirtschaftlichen, sozialen, soziokulturellen und ökologischen Gesichtspunkten sowie nach Auswirkungen auf die Frauen in der Projektregion	19
3.4 Feststellungen bei Projektfortschrittskontrollen, Verlaufskontrollen, Inspektionen und Evaluierungen und deren Auswirkungen auf die Durchführung	31
<b>4. Realisierung des Projektziels</b>	<b>32</b>
4.1 Analyse des Projektstandes im Hinblick auf das Projektziel	32
4.2 Stellungnahme, ob das Ausgangsproblem weiterhin relevant und das Projektziel aufgrund der vorliegenden Erkenntnisse erreichbar ist	33
4.3 Beurteilung, inwieweit der geplante deutsche Beitrag zur Erreichung des Projektziels geeignet ist	33
4.4 Hinweis auf notwendige Änderungen von Projektziel, Durchführungsauftrag sowie erforderliche Ergänzungs- bzw. Änderungsaufträge oder sonstige begleitende Maßnahmen	34
<b>5. Fortschreibung der Planungsvorgaben für den folgenden Berichtszeitraum</b>	<b>35</b>

## Reading Aids

In chapter 3.1: "Corresponding essential activities during report period", only the numbers of the activities are provided. Please refer to Annex I, Plan of Operations, for details.

## Abbreviations

A	=	Activity from Plan of Operations
AF	=	Agroforestry
ANAI	=	Asociation of New Alchemists Inc. (Costa Rica)
BMZ	=	Bundesministerium für wirtschaftliche Zusammenarbeit
CATIE	=	Centro Agronómico Tropical de Investigación y Enseñaza
CAR	=	Centro Agrícola Regional (Costa Rica)
DGF	=	Dirección General Forestal (Costa Rica)
ICRAF	=	International Centre for Research in Agroforestry (Kenya)
IITA	=	International Institute of Tropical Agriculture (Nigeria)
INRENARE	=	Instituto de Recursos Naturales Renovables (Panama)
MAG	=	Ministerio de Agricultura y Ganadería (Costa Rica)
MIRENEM	=	Ministerio de Recursos Naturales, Energía y Minas (Costa Rica)
NGO	=	Non governmental organization
PRODAF	=	Proyecto de Desarrollo Agroforestal (Puriscal, Costa Rica)
SR	=	Sub-Result
U	=	University



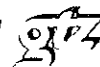
## 1. Auftrags- und problemorientierte Zusammenfassung des Projektfortschrittsberichts

(Bitte geben Sie auf einer Seite eine Zusammenfassung des Projektfortschrittsberichts. Diese Zusammenfassung wird später in die EDV übernommen. Sie darf deshalb 20 Zeilen mit 50 Anschlägen nicht überschreiten. Das Kapitel sollte sich in drei Abschnitte gliedern; der erste Abschnitt sollte sich unter Nennung des Ziels auf die Realisierung des Projektziels beziehen, siehe Kap. 4, der zweite auf die Ergebnisse und Aktivitäten, siehe Kap. 3. Der letzte Abschnitt beinhaltet wichtige Erkenntnisse aus dem Berichtszeitraum für die künftige Arbeit im eigenen Projekt oder in anderen Projekten.)

Agroforestry is recognized as one of the major objectives in CATIE's new planning and organizational structure. The Project's general objective (development and dissemination of agroforestry production systems for small farmers in the Central American Isthmus) is in complete accordance with the strategic plan of its main counterpart organization.

Collection, evaluation and documentation of bio-physical, socio-cultural and economic data of about 60 on-farm experiments in four project locations of Costa Rica and Panama are going on. Progress results demonstrate that the objectives can be reached.

Needs and opportunities of the target group's individuals had been discussed initially with selected farmers; nine research topics were chosen for on-farm trials (including timber trees and leguminous trees in cocoa plantations, trees as living supports for black pepper, timber trees in farm boundaries, forestry plantations using modified Taungya). In Puriscal (Costa Rica) the Project is testing forage trees for goats as an agroforestry systems component. Extension work at both the community and the farmers level is aimed at providing a basis for future development of models for extension by local and/or national organizations. First measures have been taken to transfer the Project's methods of technology generation, validation and dissemination to three other countries of Central America.



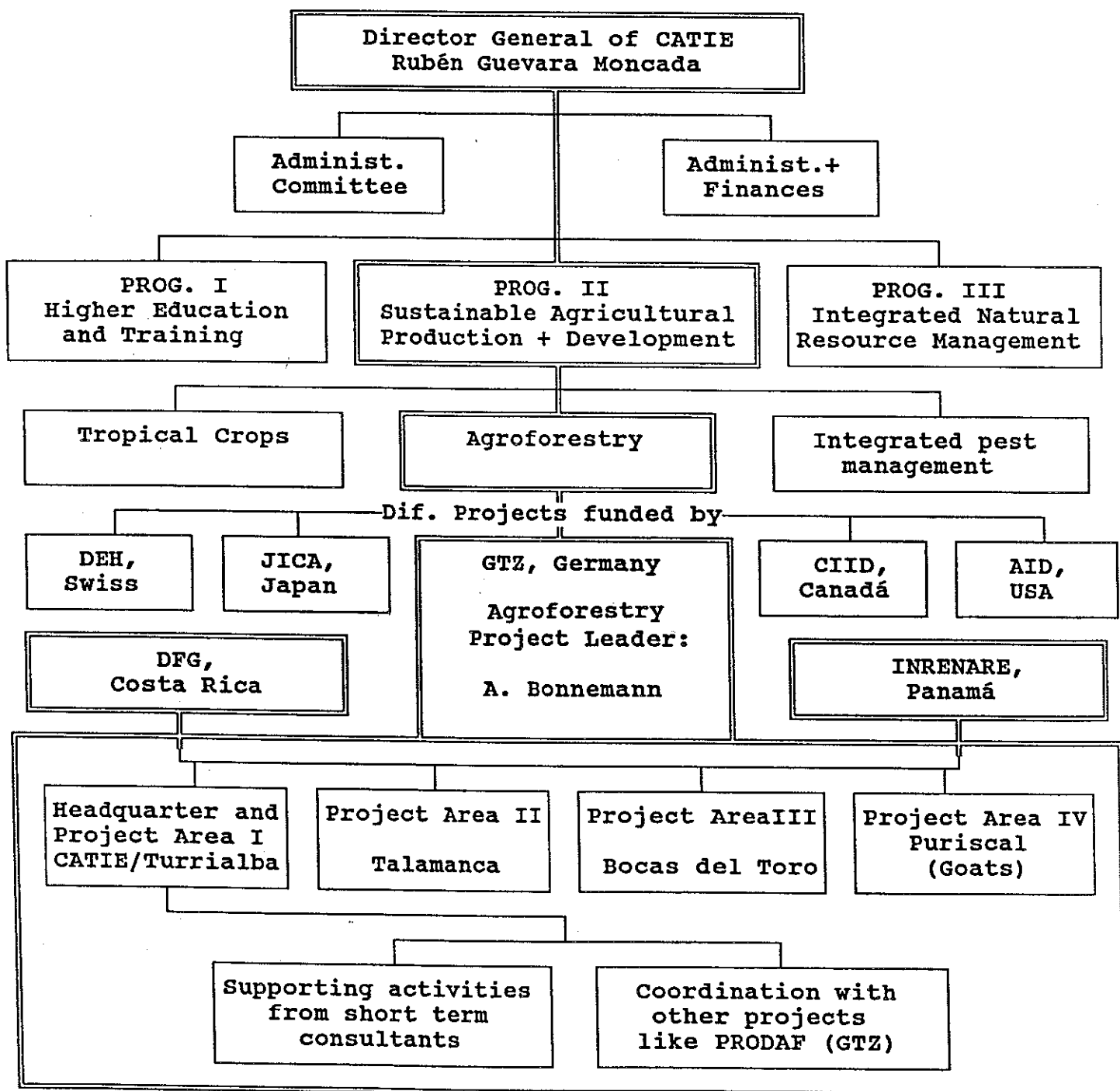
## 2. Im Berichtszeitraum erbrachte Leistungen

(siehe Angebot Punkt B 1 und B 2)

### 2.1 Personalaufwand der GTZ und des Trägers

#### 2.1.1 Organigramm des Projekts bzw. des Trägers

### THE PROJECT IN CATIE's ORGANIZATIONAL STRUCTURE



Stellenbezeichnung und Name der entsandten FK* und KZE**	2.1.2 Entsendete Fachkräfte, Kurzzeitexperten, Ortskräfte												Land COSTA RICA	Projekt-Nr. und Projektkurzbezeichnung 89. 2022.5-01.100 Agroforst/CATIE	Nur auszufüllen, wenn pro Tabelle mehrere Blätter erforderlich sind Blatt-Nr. 1			
	Personal-einsatz	19 89			19 90			19 91			19 92					Summe Mann/ Monate	Bemerkungen	
		J	F	M	J	F	M	J	F	M	J	F						M
Teamleiter	Planung II. Operationsplan															Im Projekt seit 2/87		
A. Bonnemann	akt. Planung und Ist																	
	akt. Planung und Ist																	
Wiss. Mitarb.	Planung II. Operationsplan															Im Projekt seit 82 Verspäteter Einsatz wg. Vorprojekt		
J. Beer	akt. Planung und Ist																	
H.v. Platen	akt. Planung und Ist																	
Projekthelfer	Planung II. Operationsplan															12		
G. Wachtel	akt. Planung und Ist																	
	akt. Planung und Ist																	
	Planung II. Operationsplan															85		
	akt. Planung und Ist																	
	akt. Planung und Ist																	
Summe der Fachkraftmonate der entsandten FK* und KZE**	Soll II. Operationsplan															Soll Fachkraftmonate lt. Angebot an das BMZ (entsandte Fachkräfte und Kurzzeitexperten)		
	Ist																	
Summe der Fachkraftmonate Ortskräfte	Ist																	



2.1.2 Entsandte Fachkräfte, Kurzzeitexperten, Ortskräfte

Lokale Fachkräfte

Stellenbezeichnung und Name der entsandten FK* und KZE**	Personal-einsatz	Land												Projekt-Nr. und Projektkurzbezeichnung	Bemerkungen	Summe Mann/ Monate	Blatt-Nr.
		Costa Rica															
		19__															
		19_89	19_90	19_91	19_92												
		J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D					
<u>Wiss. Mitarb.</u>	Planung II. Operationsplan																
J. Beer	akt. Planung und Ist																35
E. Somarriba	akt. Planung und Ist																36
	Planung II. Operationsplan																
L. Meiléndez	akt. Planung und Ist																36
W. Campos	akt. Planung und Ist																36
	Planung II. Operationsplan																
L. Domínguez	akt. Planung und Ist																36
	akt. Planung und Ist																
	Planung II. Operationsplan																
<u>Assistenten</u>	Planung II. Operationsplan																
G. Hudson C.	akt. Planung und Ist																36
J.J. Guevara	akt. Planung und Ist																5
	Planung II. Operationsplan																
H. Hernández	akt. Planung und Ist																30
M. Pitti	akt. Planung und Ist																36
Summe der Fachkräftemonate der entsandten FK* und KZE**	Soll II. Operationsplan																
Summe der Fachkräftemonate Ortskräfte	Ist																
	Ist																

geplanter Einsatz (Soll):  tatsächlicher Einsatz (Ist):

\* FK = Fachkräfte \*\* KZE = Kurzzeitexperten

Stellenbezeichnung und Name der entsandten FK* und KZE**	2.1.2 Entsendete Fachkräfte, Kurzezeitexperten, Ortskräfte												Land	Projekt-Nr. und Projektkurzbezeichnung	Nur auszufüllen, wenn pro Tabelle mehrere Blätter erforderlich sind Blatt-Nr. 3									
	Lokale Fachkräfte und Hilfskräfte																							
	Personal-einsatz	19 89			19 90			19 91			19 92					Summe Mann/ Monate								
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
<u>Assistenten</u>																								
J. Alvarez	Planung lt. Operationsplan																							
	akt. Planung und Ist																							
G. Campos	akt. Planung und Ist																							
<u>Sekretärinnen</u>	Planung lt. Operationsplan																							
L. Ugaide	akt. Planung und Ist																							
R. Solano	akt. Planung und Ist																							
<u>Feldarbeiter</u>	Planung lt. Operationsplan																							
	akt. Planung und Ist																							
	akt. Planung und Ist																							
<u>Wiss. Mitarb. (Ziegenkomp). E. Madrigal</u>	Planung lt. Operationsplan																							
	akt. Planung und Ist																							
	akt. Planung und Ist																							
<u>M. Vallejo</u>	Planung lt. Operationsplan																							
	akt. Planung und Ist																							
	akt. Planung und Ist																							
<u>Assistent (Ziegenkomp)</u>	Planung lt. Operationsplan																							
	akt. Planung und Ist																							
	akt. Planung und Ist																							
<u>F. Castua</u>	Planung lt. Operationsplan																							
	akt. Planung und Ist																							
	akt. Planung und Ist																							
<u>Summe der Fachkraftmonate der entsandten FK* und KZE**</u>	Soll lt. Operationsplan																							
	Ist																							
	Ist																							

geplanter Einsatz (Soll):  tatsächlicher Einsatz (Ist):

\* FK = Fachkräfte \*\* KZE = Kurzezeitexperten






Stellenbezeichnung und Name	2.1.3 Einsatz von Counterparts												Land	Projekt-Nr. und Projektkurzbezeichnung	Blatt-Nr.													
	19 89 19 90 19 91 19 92 19 93																											
	J	F	M	A	M	J	J	A	S	O	N	D				J	F	M	A	M	J	J	A	S	O	N	D	
Forstbeamtin DGT, Costa Rica J. Segleau J. Gómez	Personal-einsatz																								Summe Mann/ Monate	36		
	Planung lt. Operationsplan																											
	akt. Planung und Ist																											
	akt. Planung und Ist																											
Forstbeamter DIRENA, Nicaragua. B. Lanuza	Personal-einsatz																								Summe Mann/ Monate	36		
	Planung lt. Operationsplan																											
	akt. Planung und Ist																											
	akt. Planung und Ist																											
Forstbeamter INRENARE, Panamá F. Dixon	Personal-einsatz																								Summe Mann/ Monate	36		
	Planung lt. Operationsplan																											
	akt. Planung und Ist																											
	akt. Planung und Ist																											
Summe der Fachkraftmonate	Personal-einsatz	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	Summe Mann/ Monate	108	Soll Fachkraftmonate lt. Angebot an das BMZ	
	Planung lt. Operationsplan																											
	akt. Planung und Ist																											
	akt. Planung und Ist																											


geplanter Einsatz (Soll):  tatsächlicher Einsatz (Ist):



2.2 Materialeinsatz, Betriebs- und Unterhaltungskosten und Baumaßnahmen (GTZ, Träger und Dritte)


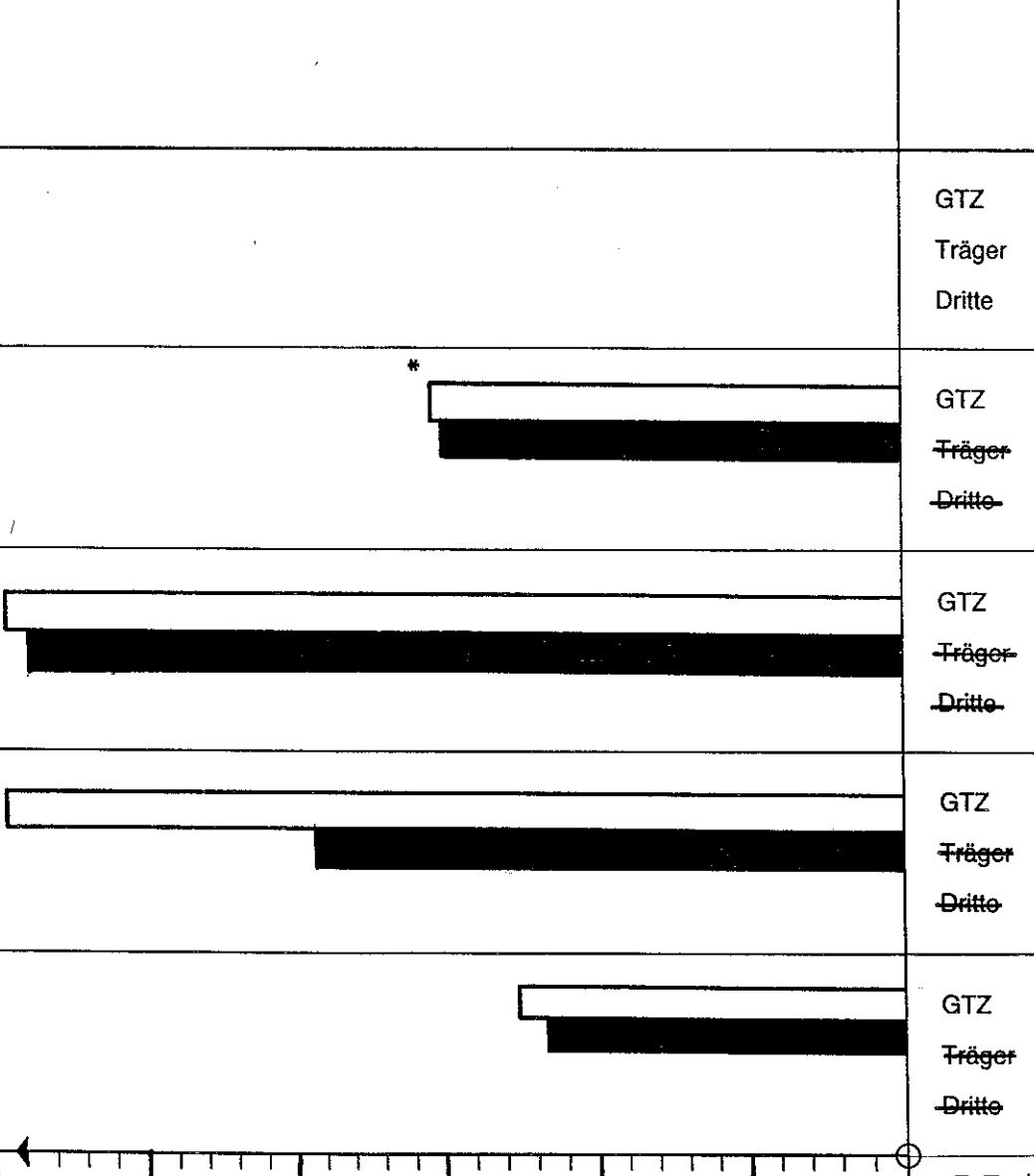
 Ausrüstungs- und Verbrauchsgüter (Leistungen der GTZ)	Land		Projekt-Nr. u. Projektkurzbezeichnung		Nur ausfüllen, wenn pro. Tabelle mehrere Blätter erforderlich sind		
	Costa Rica		89.2022.5-01.100 Agroforst/CATIE		Blatt-Nr.		
	19__		19__		Bemerkungen		
	Planv/ist	19_89	19_90	19_91	19_92	19__	
Ausrüstungs- und Verbrauchsgüter (n. Arbeitsbereichen gegliedert)		J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D	J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D	J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D	J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D		
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4 Motorräder	Planung II. Operationsplan akt. Planung und ist		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
EDV-Ausstattung	Planung II. Operationsplan akt. Planung und ist		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Div. Feldausrüstung	Planung II. Operationsplan akt. Planung und ist		<input checked="" type="checkbox"/>				
	Planung II. Operationsplan akt. Planung und ist		<input checked="" type="checkbox"/>				
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geplantes Eintreffen der Lieferung im Projekt (Soll): ○ tatsächliches Eintreffen der Lieferung im Projekt (Ist): X

	2.2.2 Ausrüstungs- und Verbrauchsgüter (Leistungen des Trägers und Dritter)				Land		Projekt-Nr. und Projektkurzbezeichnung  89.2022.5-01.100 Agroforst/CATIE	Bemerkungen	Nur ausfüllen, wenn pro Tabelle mehrere Blätter erforderlich sind  Blatt-Nr.	
	Plan/ist	19.89	19.90	19.91	19.92	19.93				Costa Rica
		J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D	J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D	J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D	J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D	J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D				
Ausrüstungs- und Verbrauchsgüter (n. Arbeitsbereichen gegliedert)										
1 Kfz							Finanziert durch COSUDE/COTESU			

Gebäude bzw. Funktionseinheit	2.2.3 Baumaßnahmen (Leistungen durch GTZ, Träger oder Dritte)												Land Costa Rica	Projekt-Nr. und Projektkurzbezeichnung Agroforst/CATIE 89.2022.5-01.100	Nur ausfüllen, wenn pro Tabelle mehrere Blätter erforderlich sind Blatt-Nr.										
	Plan/Ist	19__			19__			19__			19__					Bemerkungen									
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M		A	M	J	J	A	S	O	N	D
Planung II. Operationsplan																									
	akt. Planung und Ist																								
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	akt. Planung und Ist																								


geplanter Einsatz (Soll):  tatsächlicher Einsatz (Ist):

	2.2.4 Betriebs- und Unterhaltungskosten (Übernahme durch GTZ, Träger oder Dritte)					Land COSTA RICA	Projekt-Nr. und Projekturzbezeichnung 89.2022.5-01.100 Agroforst/CATIE	Nur auszufüllen, wenn pro Tabelle mehrere Blätter erforderlich sind Blatt-Nr.
Skala mit Landes- währung beschriften  In US-\$	19.89	19.90	19.91	19.92	19__	Bemerkungen		
	GTZ Träger Dritte	GTZ Träger Dritte	GTZ Träger Dritte	GTZ Träger Dritte	GTZ Träger Dritte			
Wechselkurs 57,14 = 100,00 DM 100 US-\$ = 175 DM per -----								

\* End of phase IV

Soll laut Operationsplan:

Ist:

		2.3 Aus- und Fortbildung von Partnerfachkräften													Land	Projekt-Nr. und Projektkurzbezeichnung	Blatt-Nr.
		COSTA RICA															
Stellenbezeichnung und Name	Aus- und Fortbildung	19_89			19_90			19_91			19_92			19_93			Bemerkungen (z. B. Art der Aus- u. Fortbildung)
		J	F	M	J	F	M	J	F	M	J	F	M	J	F	M	
M. Mendieta	Planung lt. Operationsplan																M.Sc. Studium am CATIE
	akt. Planung und Ist																
	akt. Planung und Ist																
J. Bustamante	Planung lt. Operationsplan																M.Sc. Studium am CATIE
	akt. Planung und Ist																
	akt. Planung und Ist																
J.J. Guevara	Planung lt. Operationsplan																Studium an ESNACIFOR, Honduras
	akt. Planung und Ist																
	akt. Planung und Ist																
L. Melendez	Planung lt. Operationsplan																M.Sc. Studium am CATIE
	akt. Planung und Ist																
	akt. Planung und Ist																
Summe der Fachkraftmonate	Soll lt. Operationsplan			7			12			12			12			13	Soll Fachkraftmonate lt. Angebot an das BMZ
	Ist			7			12			12			12				

geplante Fortbildung (Soll):  durchgeführte Fortbildung (Ist):

Nur auszufüllen, wenn pro Tabelle mehrere Blätter erforderlich sind  
Blatt-Nr.





#### **2.4 Zuschußzahlungen an einheimische Fachkräfte des Trägers**

No topping-up funds for local experts are granted. However, as recognized in the Project Agreement, most staff are hired by CATIE using GTZ-funds.

#### **2.5 Von der GTZ übernommene bzw. aus Projektmitteln vorfinanzierte Leistungen des Partners**

There is no advance financing of counterpart contributions.

#### **2.6 Einsatz von Eigenmitteln der GTZ im Projektumfeld**

No own-GTZ funds have been used.



**2.7 Übereinstimmung der Leistungen der GTZ mit dem verbindlichen Rahmen des Auftrags  
(siehe Angebot Teil B).**

(Begründung zur Vorgehensweise und Erläuterung der ergriffenen Maßnahmen, falls vom Auftrag abgewichen wurde)

The GTZ input is in line with the planned and agreed framework.

**3. Presentation and evaluation of the results during the period covered by the report, including eventual discrepancy from the planning.**

**Result 1:** Agroforestry production systems developed and evaluated, using criteria of production technology and ecology.

**Activities:**

- 1.1: Continue agroforestry basic research.
- 1.2: Identify and describe existing systems of agroforestry production.
- 1.3: Evaluate and select agroforestry production systems by their aspects of production techniques.
- 1.4: Identify new agroforestry technology trials.
- 1.5: Develop methods of land use planning for small and middle sized farmers.
- 1.6: Continue existing trials on introduction of trees in agricultural production systems.
- 1.7: Implement natural forest management trials in farms.
- 1.8: Implement new trials about the integration of trees in farm production systems.
- 1.9: Incorporate and evaluate new species (especially fruit trees) into the agroforestry systems.
- 1.10: Continue the development of methods for applied agroforestry research.

**Result 2:** Socio-economic aspects of agroforestry production systems are analyzed and evaluated.

**Activities:**

- 2.1: Review methods of economic analysis concerning applicability to evaluation of agroforestry systems.
- 2.2: Collect and analyse data for socio-economic evaluation of agroforestry systems.
- 2.3: Analyse and inform about socio-cultural structures of the different ethnic groups.
- 2.4: Research on the socio-economic aspects of the traditional production systems in the region.
- 2.5: Analyse and evaluate the agroforestry systems implemented by the Project.
- 2.6: Analyse the marketing systems of the most important products in the Project's working area.
- 2.7: Analyse economic and social aspects of the integration of recommended production systems into traditional farming systems.

**Result 3:** Conditions are arranged to transfer the results, together with the national extension services and NGO's, to the target groups (small and medium sized farms).

**Activities:**

- 3.1: Promote the agroforestry idea in extension programmes of regional organizations.
- 3.2: Develop extension techniques and educational aids suitable for assistance to farmers.
- 3.3: Contribute to short courses for extensionists
- 3.4: Participate in training of local extensionists and farmers.
- 3.5: Train external professionals in applied agroforestry research.
- 3.6: Foster logistical assistance to farmer groups to facilitate the purchase of germplasm.
- 3.7: Inform decision-makers about the importance of agroforestry.

**Result 4:** Education and training in agroforestry and related disciplines is promoted.

**Activities:**

- 4.1: Fund an M.Sc. scholarship in CATIE's agroforestry programme.
- 4.2: Give technical and logistical assistance to Masters and Doctorate Studies in the field of agroforestry.
- 4.3: Fund a scholarship for training of a Forest Technician.
- 4.4: Participate in CATIE's postgraduate courses, especially in the fields of agroforestry, soil science, socio-economics and socio-anthropology.
- 4.5: Provide funding to promote the participation of national experts of Central America and Panama in courses and seminars in the fields of forestry, agroforestry, watershed management, extension, project evaluation etc., according to CATIE's offers.

**Result 5:** Results and experiments of the Project are transferred to other projects.

**Activities:**

- 5.1: Give assistance to projects with agroforestry components in CATIE's mandate region or to other GTZ-projects.
- 5.2: Make available agroforestry results and experiences to interested local experts.
- 5.3: Support local institutions and extension services in the formulation of extension and development programmes.

**Result 6:** Agroforestry alternatives for goat forage production are developed. (NOTE: This is a technically independent component, only included administratively in the project.)

**Activities:**

- 6.1: Identify species of forage potential.
- 6.2: Testing of biomass-production of identified species.
- 6.3: Tests of acceptance and consumption of forage species.
- 6.4: Evaluation of production systems.
- 6.5: Installation of an experimental station.

**Result 7:** The execution of the Project is ensured as planned.

**Activities:**

- 7.1: Draw up plan of operations for Phase IV, review and adjust periodically.
- 7.2: Develop and use a participatory M&E-System.
- 7.3: Plan and support short-term consultancies.
- 7.4: Coordinate Project measures with national organizations and institutions.
- 7.5: Insure administrative and logistical support for Project.
- 7.6: Improve the Project's infrastructure.
- 7.7: Prepare an eventual fifth phase of the Project (Project Advance Control and ZOPP V).

**Result 1:** Agroforestry production systems developed and evaluated, using criteria of production technology and ecology.

### **3.1 Indicators and essential activities by result** Corresponding Indicators

At least two promising agroforestry production systems are developed and tentatively evaluated on the basis of two years data collection and observation.

Corresponding essential activities during report period

1.1.1, 1.1.3 - 1.1.6, 1.1.9, 1.6.1, 1.6.4, 1.7.2, 1.10

### **3.2 Assumptions, risks and essential external influences by result (as in Offer)**

The counterpart institution CATIE has limited financial resources. To comply with its mandate, it has to rely on externally financed projects and is thus for the project primarily an operational base. Due to its regional mandate and legal status, CATIE is linked with national institutions and governments. It guarantees and supports, with corresponding agreements, the continuation of the activities and their implementation. It is reasonable to believe that CATIE will comply on time and without restrictions with its commitments, as it did in the past.

### **3.3 Report on the execution of activities by result. Valuation of the result according to technical, economical, social, socio-cultural and ecological criteria and effects on women in the Project Region.**

In order to understand the mechanisms and interactions underlying the performance of trees with crops, studies are carried out in long term experiments on CATIE sites. Data of the on-station experiments Laurel-Poro-Coffee (site 169, A 1.1.4) and "La Montaña" (Laurel-Poro with Coffee-Cocoa, A 1.1.3 and 1.1.5) are analysed. The special experimental design of the "169" trial allows the monitoring of the effects of different tree stocking densities on coffee yields and soil characteristics. Competition indices will be calculated and available in one year from now, as an important methodological contribution to agroforestry science. It should be noted that strategic research represents only a small part of the Project's actual activities.

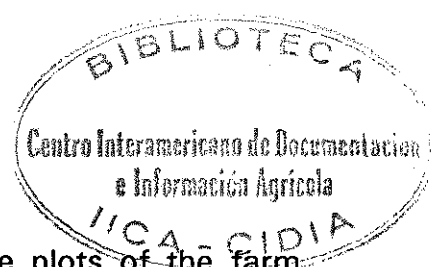
15 years of monitoring yield, biomass, and soil conditions make the "La Montaña" trial one of the few classical AF-research trials in the world. Results are published in a series of presentations (Latest publication: "Ten year balances of organic matter and nutrients in agroforestry systems at CATIE, Costa Rica"). The collection of data for the 15 year evaluation is underway. A destructive analysis of below-ground and above-ground biomass distribution is in its planning phase. In collaboration with the Universities of Göttingen and München, this investigation will validate predicted data of previous models, but the realisation depends on additional funding. A related project proposal has been submitted to the Deutsche Forschungsgemeinschaft.

The main activities of the Project are carried out in the form of applied research and on-farm experimentation in three areas, Talamanca and Puriscal (Costa Rica) and Bocas del Toro (Panama) (SR 1.6). The role and potentials of agroforestry are analyzed at the level of the production system as well as at the farm level. Field work is advancing as planned. Responding to the farmers and donors immediate expectation, studies are emphasising the generation of applicable technologies. Most of the experimental plantation plots are developing well. The important trials include: i) Shade management in cocoa plantations, using either leguminous or timber tree species; ii) converting unmanaged shade overstories into managed shade canopies in established cocoa plantations; and iii) a more complex system, with a strong economic approach, suggested by farmers, in which cocoa, plantain and timber species are associated.

Because of lower price levels and disease problems in cocoa, special attention is given on the monitoring of shade effects on the interrelationship between *Monilia* and/or *Phytophthora* and the use of disease resistant cocoa germplasm. The technology package to be offered to farmers must ensure a high yielding cocoa component if it is to be attractive. Therefore in two experiments, the genetic improvement of cocoa, by way of grafting, is studied.

The research on black pepper with trees as living supports is now concentrated in two experiments. After an external review, and balancing investments and gained experiences on one hand with the remaining potentials in scientific gains and demonstration effects on the other, the decision was made to continue with the most promising trials, using improved germplasm and refined management techniques (A 1.1.6). Nevertheless, discussion continues whether a system with such high maintenance and management costs can be recommended to the Project's main target group.

The agrosilviculture experiment (A 1.6.4), using "Taungya"-methods during the implementation phase, is now in the commercial production phase. The first thinning material has been harvested and the fruit tree component is starting to produce. Special attention will be given to the economics of this trial. Timber production combined with a well accepted fruit production is a promising and convincing agroforestrysystem, now reaching a phase in which the first recommendations and some technology transfer can be made.



Studies and management measures are continued in the plots of the farm forestry wood lot in a remanent natural forest site. CATIE's project on Silviculture of Natural Forests has taken over most of the responsibilities of future management and data collection. A student of Freiburg University has taken new data in the follow-up of the experiment (GTZ-Programme: Guest Students). Further evaluation of the farm forestry aspects will continue to be one of the Projects tasks (link to the Institute of Silviculture, Department Tropics and Subtropics, University of Freiburg).

Timber tree testing in the set of boundary planting plots is continued. Valuable results about the variability in growth, form and pest or disease resistance are being obtained. To compare performance and increment data of the tree species used in these trials, with the corresponding parameters of the same species in other sites of the region, data are collected for a MSc.-thesis (student of U.Göttingen, GTZ-programme for guest students). The next task will be to determine the magnitude and the causes of the differences in the performance of the trees.



**Result 2: Socio-economic aspects of agroforestry production**

**3.1 Indicators and essential activities by result**

**Corresponding Indicators**

At least two promising agroforestry production systems are evaluated in their socioeconomic aspects on the basis of two years observation.

Corresponding essential activities during report period.

2.1, 2.2, 2.3, 2.5, 2.7

**3.2 Assumptions, risks and essential external influences by result (as in Offer)**

**3.3 Report on the execution of activities by result. Valuation of the result according to technical, economical, social, socio-cultural and ecological criteria and effects on women in the Project Region.**

Research on methodology in evaluating agroforestry systems (2.1) is giving evidence that a twofold approach has to be considered, especially in view of the objective to feed results directly into farmers recommendations.

- Farmers show, primarily, most interest in relatively simple facts like the influence of the associated trees on the main crop, costs of planting trees, labour requirements for their maintenance, harvesting costs, expected product volume. Results of this kind lead to farmer information.
- Whole-farm-budgeting and modelling is regarded as the appropriate approach to test the comparative advantages of cropping systems within the farming systems. Results of this kind lead to farmer recommendations.

Traditional discounting methods (Benefit-Cost-Analysis, Internal Rate of Return, etc.), based on partial budgeting techniques, can be applied, but will yield information with only limited practical use for the target group. These methods seem to satisfy more the requirements of commercial farmers and the medium level analyst. Conviction is growing that these methods can only be partial indicators, if at all.

Hence activities in economic analyses concentrate on the two first items. A medium-level economist was finally contracted, primarily to take over the maintenance of the Project-generated data on crop management (2.2).

The Project staff responsible for the management of the experiments are acquiring a daily routine in this kind of data taking. This is done under the supervision of the economic staff, which for the time being and under the conditions of the establishment of the routine, are not sufficient in number to compensate for the extra amount of work.

Activities on analyzing the farming systems in the project area of Talamanca (2.7) are being carried on and will yield an intermediate result in the form of a Master Thesis. The search for the right tools (Linear Programming Packages) took up more time than expected, but the basic modelling technique has been developed and some agroforestry cropping systems are being tentatively incorporated. The method is promising good results.

Activity 2.3 (Analyze and inform about socio-cultural structures of the different ethnic groups) has finally been withdrawn after long discussions. It was not quite clear to the Project team what the outcome of this activity should be, nor what immediate benefit it would have for the Project.

**Result 3:** Conditions are arranged to transfer the results, together with the national extension services and NGO's, to the target groups (small and medium holding Farmers).

### **3.1 Indicators and essential activities by result**

#### **Corresponding Indicators**

National and NGO extension services have included Project-developed agroforestry messages into their extension programmes.

Corresponding essential activities during report period

3.1.1, 3.1.2, 3.1.3, 3.2 - 3.5

### **3.2 Assumptions, risks and essential external influences by result (as in Offer)**

The Project will always rely extensively on the cooperation of small farmers and national extension services, when testing, evaluating and especially implementing the developed agroforestry techniques and systems. Both of the national organizations, the Direccion General Forestal (DGF) in Costa Rica and the Instituto de Recursos Naturales Renovables (INRENARE) in Panama are weak in their personel and financial aspects. This limits the progress and efficiency of their activities and their persistance in collaborating with the Project.

Although both institutions (until now) showed high interest in the Project measures and supported them within their capacities, additional cooperation with NGO's, (e.g. Assoc. of New Alchemists Inc. (ANAI), are necessary.

According to our past experiences, the willingness of the target groups in cooperating in the development and testing of agroforestry systems can be regarded as good.

### **3.3 Report on the execution of activities by result. Valuation of the result according to technical, economical, social, socio-cultural and ecological criteria and effects on women in the Project Region.**

The most important farmer organization in the Project's work zone "Talamanca Baja" is APPTA (Asociación de Pequeños Agricultores en Talamanca). The Project's objective in technology transfer and dissemination, comprises the development of transfer and extension models. A first pilot project for such a model has been worked out together with APPTA staff. The basic idea of this prototype is the establishment of community committees of farmers related to reforestation and agroforestry activities. The initial phase takes place in two indigenous communities (Coroma and Shuak <Yorkin>), mainly because of the existing

organizational structure, which presently are not part of the main Project's work zone. It will be seen later how this model may apply to the technology transfer of the main Project.

With a view to a working agenda for technology transfer in the next phase of the Project, some strategy elements have been discussed with different institutions (Madeleña, Finida, CATIE; IICA/GTZ). The conclusions are:

- Different institutions and methodologies are required for different target groups and different technology problems.
- Technology transfer has to be made as part of a process in which the generation of technology, its transfer, and its use are integrated.
- The technological recommendations have to be relevant and clearly defined.
- The participation of farmers is an essential part of the technology generation and transfer process
- The technology transfer requires flexible and agile institutional and operative processes. Public sector agricultural extension systems would be given therefore less priority. But actions involving all the farmers in a given area, which require public transfer mechanisms such as education, training and work with groups, rather than the actual more common technical assistance models based on work with individuals, will continue to depend on the collaboration with the public sector.

CATIE has invited applications for the post of an expert in technology transfer for the Project.

**Result 4:** Education and training in agroforestry and related disciplines is promoted.

### **3.1 Indicators and essential activities by result** Corresponding Indicators

Eight local technicians are being trained at various educational levels and 12 participants have been funded for participation in training seminars.

Various short, field-level courses for local extension agents have been given regarding extension methods and agroforestry.

Corresponding essential activities during report period.

### **3.2 Assumptions, risks and essential external influences by result (as in Offer)**

#### **3.3 Report on the execution of activities by result. Valuation of the result according to technical, economical, social, socio-cultural and ecological criteria and effects on women in the Project Region.**

The three year training period in ESNACIFOR, granted as a scholarship to a former field assistant of the Project (J.J.Guevara) will be successfully concluded with the end of the next semester.

A M.Sc. scholarship in CATIE's higher education programme has been granted to Miguel Vallejos, who during two years has been assistant in the Project's "tree forage for goats" component.

L.Melendez (M.Sc. scholarship 1991-1993) has started the field work for his thesis in one of the on-farm experiments of the Project.

Data analysis of three doctoral theses is continuing (J.Beer, U.Oxford; E.Somarriba, U.Michigan; A.Schlönvoigt, U.Göttingen).

For the conclusion of the latter research a project has been implemented between GTZ and the Silviculture Institute of the Göttingen university (Title: "Cooperation of the University of Göttingen with CATIE", number: 89.2143.9-01.102; duration: nov. 91 - may 93).

Project personnel are involved in the tutoring of three M.Sc. theses of CATIE's post-graduate programme in agroforestry.

A full 3-credit course, in CATIE's Master Programme, on the marketing of forestry products, has been planned by the Project economist and completed with the assistance of two other CATIE economists.

Project staff have participated in various international meetings (e.g. China) and offered seminars (e.g. U. Oxford M.Sc. programme) where agroforestry was being promoted by national institutions.

**Result 5:** Results and experiments of the Project are transferred to other projects.

**3.1 Indicators and essential activities by result**  
Corresponding Indicators

At least four projects use experiences and results of the CATIE/GTZ-Agroforestry Project.

Corresponding essential activities during report period.

5.1.1, 5.1.2

**3.2 Assumptions, risks and essential external influences by result (as in Offer)**

**3.3 Report on the execution of activities by result. Valuation of the result according to technical, economical, social, socio-cultural and ecological criteria and effects on women in the Project Region.**

An important exchange of ideas between agroforestry projects has been possible during the International Agroforestry Symposium in Nanjing, China (Apr.,27 - May,5, 1992). Among other conclusions, it was recognized that at the present stage, all over the world, building a bridge between research and rural development is one of the priority problems and a challenge for agroforestry research projects.

In a pre-planning session, regarding the IUFRO-Agroforestry meetings of the next years, the following sequence was proposed: 1993 Los Banos, Philippines; 1994 Helsinki, Finland; 1995, CATIE, Costa Rica.

One project member was invited to participate, together with representatives from ICRAF and IITA, as well as the principal forestry and agricultural advisors, in the British Government's (ODA) review meeting on future priorities for agroforestry research.

**Result 6:** Agroforestry alternatives for goat forage production are developed. (NOTE: This is a technically independent component, included in the project only administratively.)

### **3.1 Indicators and essential activities by result** Corresponding Indicators

At least three alternatives to goat-keeping are being tested.

Corresponding **essential** activities during report period.

A 7.1 - 7.5

### **3.2 Assumptions, risks and essential external influences by result (as in Offer)**

In addition to the activities in CATIE, a strong collaboration with the CAR-Puriscal and the bilateral project PRODAF is planned on a regional level. Results are thus dependent on the possibilities of the corresponding counterparts to fulfill their contribution and on whether or not sufficient cooperating farmers can be encountered and permanently attended. As both counterparts have promised concrete contributions, a good cooperation is expected.

Target-group related risks are to be encountered in the unknown (free) labour-capacity of the farms and especially of the women, who are currently responsible for attending goats. Stabling could be another problem. There are also potential risks in the acceptance of goat-milk and its derivatives for home consumption.

However, according to current knowledge, we consider these risks as low.

### **3.3 Report on the execution of activities by result. Valuation of the result according to technical, economical, social, socio-cultural and ecological criteria and effects on women in the Project Region.**

The new plan for the integrated goat management component of the Project has been implemented. The research and development activities are going on as planned.



The counterparts have fulfilled their obligations and good cooperation exists.

Data collection to evaluate the goat component in small farms in Puriscal is going on. The analysis work is being counselled by the Project economist.



### **3.4 Feststellungen bei Projektfortschrittskontrollen, Verlaufskontrollen, Inspektionen und Evaluierungen und deren Auswirkungen auf die Durchführung**

(Dieser Punkt bezieht sich auf alle Ergebnisse)

(Results of project progress monitoring, inspections and evaluations and their impact on implementation.)

Based on the project progress monitoring in november 1991 and the new planning matrix, an implementation offer has been made. The corresponding BMZ commission for the phase Aug. 1992 to July 1995 is expected.



#### 4. Realisierung des Projektziels

(siehe Angebot an das BMZ, Punkt A2)

(Realisation of Project purpose)

##### Projektziel

Adapted agroforestry farming systems for small and midium-sized farms in problematic areas are deveveloped and introduced.

- 4.1 Analyse des Projektstandes im Hinblick auf das Projektziel
- 4.2 Stellungnahme, ob das Ausgangsproblem weiterhin relevant und das Projektziel aufgrund der vorliegenden Erkenntnisse erreichbar ist
- 4.3 Beurteilung, inwieweit der geplante deutsche Beitrag zur Erreichung des Projektziels geeignet ist
- 4.4 Hinweis auf notwendige Änderungen von Projektziel, Durchführungsauftrag (verbindlicher Rahmen gem. B 1.1 des Durchführungsangebots oder der Projektvereinbarung) sowie erforderliche Ergänzungs- bzw. Änderungsaufträge oder sonstige begleitende Maßnahmen

#### 4.1 Analysis of the progress of the Project in the light of the Project purpose.

Indicators for the main objectives in phase IV, were the existence of systematically tested agroforestry methods as a basis for broader development and extension projects. In the next phase, more emphasis will be given to the transfer follow-up. Therefore the main focus in phase V will be the establishment of integrated systems for technology generation and transfer (TGT).

The agroforestry experiences of the Project are today mainly related to production systems in the lowland humid tropics. The development of TGT systems in other countries of CATIE's mandate region will be initially focused on similar agro-ecological areas.

As part of CATIE's "Agroforestry Area", the Project activities are integrated in a regional institution which has an interdisciplinary focus. Constant information exchange with other CATIE activities, which involve many national and international organizations working in Central America, has an important influence on project development and is an important output of project activities.

In the new organizational structure given to CATIE, agroforestry has now its own department (area). The long expected coordinator of this area has been appointed.

More than 60 experiments are established on about 50 private farms. The main specific objectives of the on-farm trials are to obtain productivity data for a limited number of promising technology alternatives. The principal agroforestry practices which were selected for research and development are: timber production on farm boundary lines; cacao plantations under shade; and the use of living support posts for black pepper. The ongoing monitoring of trial plots is developing according to plan. The increasing amount of data requires a transition to more activities in data processing, validation and dissemination.

Collaboration with CATIE on agroforestry research and development has had an important feedback effect. The benefits to European institutions as well as national organizations within Central America, in terms of helping them to build up/update their expertise in this relatively new discipline, should not be underestimated.

**4.2 Comment, whether the initial problem is still relevant and if the Project purpose can, according to available results, still be achieved.**

Central America, CATIE's mandate area, is facing the problem of destruction of its natural resource base, the very foundation of the predominantly agrarian societies that characterize the region. Responsible management of renewable resources is a requisite for sustainable economic growth. Agroforestry practices have the potential to maintain or increase site productivity through nutrient recycling and soil protection, at low capital and labour costs. These practices also diversify the range of outputs from a given area, in order to increase self-sufficiency or/and reduce the income-risk of adverse climatic, biological or market impact on particular crops.

CATIE has achieved a comparative advantage in the field of agroforestry research and development, to a significant degree thanks to the GTZ Project activities.

**4.3 Appraisal, how far the planned German contribution is suited to achieve the Project purpose.**

The planned German contribution will be sufficient in the programmed duration of the Project.

Given the good cooperation with CATIE, and taking into account the progress of the ongoing research work, it is important to reiterate that

- Further cooperation with CATIE, based on the existing Agroforestry Project is beneficial and purposeful for future AF research and dissemination in Latin America.
- Given the naturally complex and lengthy character of agroforestry research, cooperation with CATIE should be continued for a longer period of time to assure reliable technology-generating research and the following technology transfer to the target groups in different ecosystems of CATIE's mandate region.
- The election of a new General Director has brought changes to CATIE's governance. As a consequence of the ongoing difficult financial situation, an austerity programme for CATIE is being applied to comply with its obligations in education and research.
- The Board of Directors has been changed in structure and composition. Four members are scientists from the international scientific community, another four members are scientists or entrepreneurs of the member countries, one represents IICA, and one JIA (Junta Interamericana de Agricultura).
- The number of member countries increased from 7 to 9. New members are Venezuela and Mexico.
- A new strategic plan of the institution has been drawn up.
- The renewals are promising; further achievements will depend on the effectiveness of the austerity programme and still for a great number of years on external funding.

#### **4.4 Indications on necessary changes of project purpose, implementation order.**

For the next period the recently formulated Project purpose of phase V will be applied.



## 5. Fortschreibung der Planungsvorgaben für den folgenden Berichtszeitraum

(Der für den nächsten Berichtszeitraum geschätzte Personaleinsatz, der geschätzte Einsatz von Maschinen, Betriebs- und Unterhaltungskosten sowie Baumaßnahmen ist in den Tabellen zu Punkt 2 enthalten)

Planning of activities for the next report period is provided in annex 2, plan of operation.















Plan Operativo del Proyecto Agroforestal CATIE/GTZ, 1990-1992, Pagina 7. Version Preliminar.

Resultado / Sub-Resultado / Actividad	1991												1992													
	R	P1	P2	P3	P4	1Feb	Mar	Abr	May	Jun	Jul	Ago	Set	Oct	Nov	Dic	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	hasta	
SR 7.6 Mejorar la infraestructura del Proyecto																										
7.6.1 Comprar Mitsubishi Montero Diesel y tres Motos Bocas	AB																									
7.6.2 Comprar 2 motos para Bocas y reemplazar motos de Talamasca	AB																									
7.6.3 Comprar 4 Computadoras (2 Laptop, 2 Desktop)	ES																									
SR 7.7 Preparar una eventual proxima fase V del Proyecto																										
7.7.1 Preparar CAP y ZOPP V para la Fase V	AB	HVP																								
7.7.2 Control de Avance de Proyecto y ZOPP V	CE																									

FALTAN (segun oferta GTZ - BMZ)

Estudio 'Socio-economico/Antropologico'  
Estudio 'Metodos de evaluacion participativa'

Actividad	Responsable	Financiamiento	Participantes
A = Actividad			
AB = Arnie Bonneann	JG = Juan Guvera	FE = Financiamiento Externo	P1 - P4= Participantes
AS = Asistente	JH = Jeremy Haggar	FD = Francisco Dixon	PP = Presupuesto pendiente
BU = Bustamante, Estudiante	JS = Jean Segleau	GK = Gerald Kapp	R = Resultado/Responsable
CAP= Control de Avance de Proyecto (GTZ)	JV = John Vandermeer	HH = Heriberto Hernandez	RH = Reinhold Muschler
CE = Consultor externo	LD = Lazaro Domiguez	HVP= Henning von Platen	SA = Sandro Anderson
CK = Cornelius Krekau, Estudiante	LM = Luis Melendez	INR = INRENARE	SAF= Sistemas Agroforestales
DSF= Direccion General Forestal	MP = Maxwell Pitti	IUCN	SC = Silvana Comino
E = Estudiante	O = Entrega de Informae	JA = Jorge Alvarez	SR = Subresultado
ES = Eduardo Sommeriba	ONG= Org. No-Gubernamental	JB = John Beer	TE = Tecnicos del Proyecto
	DV = Omar Villas	JC = Jorge Challette	WC = Wilbert Campos
			X = Tiempo de preparacion de informae