II. LIVESTOCK FARMING SURVEY

1. Surveyed variables

(1) Type and number of livestock

Types of livestock found in the study area are as follows:

- (1) Sheep
- 2 Cow
- 3 Alpaca
- (1) Pork
- (5) Hog
- 6 Chicken

(2) Pasturage location

(3) Pasturage area (ha)

(4) Type of grasses used for grazing

2. Results

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The results of the survey ware summarized in the following tables.

Summa Estudio	ry of lives sobre el p	Summary of livestock survey in the microcuencas Estudio sobre el pastoreo en las microcuencas	cas				Huaje (No.1)	(o.1)		€.¥1.288		Not necessary to entry	entry
			Ð,	assificati	Classification and Number of Livestock	mber of 1	ivestock		Name of pasturage zone	Pasturage area		Distance from	Sort of grasses
°Z	Date	Location		Especies y	cies y No.	No. de Cabezas	8		Nombre de la zona pastoreo	Area aprox, de 1 zona pastoreo	pasturage zone to microcuenca	microcuenca to lake	Especie de pasto
	Fecha	Localidad	Sheep Ovino	Sheep Cow Alpac Ovino Vacuno Caneli	Alpaca Canelidd F	Pork E	ca Pork Equine Chicken idd Porcino Equino	nicken				(m)	
P-HU-01	13-Feb-99	Huaie	-		 			m					Pasto natural. Totora
P-HU-02		Huaie	10	00		3		ð	Chultuni orillas del Titicaca	0.050			Totora
P-HU-03	13-Feb-99	Huaje	-					4					Totora
P-HU-04	13-Feb-99	Huaie											Totora
SO-UH-4			8	10				ŏ	Orilla del Lago Titicaca	0.050			Natural-Totora
90-'UH-4	13-Feb-99 Huaie	Huare		4				Ηſ	Huaje				Natural-Totora
P-HU-07		Huaie	- S			0		H	Huaje orilla del Lago Titicaca	0.300		27 (k 2014) 2015 2015 2015 2015	Natural
	13-Feb.00	H1:510											
	13-Feb-99	Huaie	SS	9				ð	Orilla del Lago Titicaca	0.300			Natural. Totora, Avena Heno
	13-Feb-99	Hunie	33	12	25		5	Ha	Hacienda dueñas	7.000			Natural, Forraje Avena
P-HU-11	13-Feb-99	Huaie	4					ਸੇ	Huaje	0.500		16 X 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 2	Natural
P-HU-12	P-HU-12 13-Feb-99 [Huaic	Huaic	25					Ĥ	Huaje	0:500			Natural-Totora
P-HU-13	13-Feb-99	Huaie	15					<u> </u>	Orilla del Lago Titicaca	0:050		変換ない	Natural-Totora
P-HU-14		Huaic		-			:	2 Huaje		0.005			Totora
P-HU-15	E C	Huaie	80	7		3		3 0	Orilla del Lago Titicaca	0:700			Natural, Totora, Pasto cultivado (alfalfa)
P-HU-16	13-Feb-99	Huaje	6			2		ð	Orilla del Lago Titicaca	0.010			Natural-Totora
P-HU-17		14-Feb-99 Huaie Sector San José	12					Sa	San José	000'1			Pasto natural, totora
P-HU-18	14-Feb-99	P-HU-18 14-Feb-99 Huaie Sector San José	9	-				3 Sa	San José	0.500			Natural-Totora
61-UH-9	14-Feb-99	Huaje Sector San José	2			ia Disc	in an	Sa	San José	0.500			Natural
P-HU-20		14-Feb-99 Huaje Sector San José	10	2		. 6		Sa	San José	1.500			Pasto natural, Forraje totora
		14-Feb-99 Huaie Sector San José	8					2 Sa	San José	0.040		185 187 193 193 193 193	Pasto natural, totora
		14-Feb-99 Huaje Sector San José	9			-		Sa	San José	0:050		語の語	Natural, Forraje
	Sub-total		213	48	25	25	5	11		13.055			

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Huaje (No.2)

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Summary of livestock survey in the microcuencas Estudio sobre el pastoreo en las microcuencas

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	Date	Location		Cias	Classification and Especies y N		Number of Livestock Io. de Cabezas	uvestock 25		Name of pasturage zone	Pasturaçe area	Distance from	Distance from	Sort of grasses
ź	Fecha		Γ∞o	Sheep V	Cow Alpaca Vacuno Canelido I	Npaca 1 melidd Pc	Pork E	ine	Chicken N	Nombre de la zona pastoreo	zona pastoreo (ha)	microcuenca (m)	lake (m)	Especie de pasto
P-HU-23	1	14-Feb-99 Huaje Sector San José							4		-	astatication and		
P-HU-24		Huaje Sector San José		6	2				Š	San José	0.300		5 8 8 2 8 9 8 9 8 9 8 9 8 9 8 9 8 9 8 9 8	Natural, Heno, Cebada
		14-Feb-99 Huaje Sector Llavim			ہ				1	Llavimi	0.500		11 N N N N	Pasto natural. Fortaje avena, Totora
P-HU-26		14-Feb-99 Huaje Sector Llavirri			7		2 		S L	S Llavimi	0.500			Natural, Forraje, Heno, Avena
P-HU-27	1.00	14-Feb-99 Huaje Sector Llavirri					7		<u>_</u>	Unión Llavirri	0.010	200 E 200 E 20		
P-HU-28	14-Feb-99	Hunje Sector Llavitri		12		 -			4	4 Llavirri	0,100			Pasto natural y Forraje
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ucrocuencas ventua ve	Classification and Number of Livestock Name of pasturage zone Pasturage area Distance from Distance from Ereceive v No de Cabrase Number de la zone	Sheep Cow Alpaca Pork Equine Chicken pastoreo ia zuna Artea aprov. u to Ovino Vacuno/Canelide Porcino/ Equino Ana azoreo (microcuenca	22 10 12 Cuesta Blanca	Blanca) 120 8 1 1 Cuesta Blanca 10.000 6 6 7	300 50 50 Ventila, Cuesta Blanca 50.000 Second Natural, Formije de Cebada y Avena	Blanca) 60 9 1 Cuesta Blanca 10.000 Control of Cuesta Blanca	pirhuani) 5 5 6 7 Natural 0.300 56 56 5 1 Natural	6 5	pirhuani) 7 2 Natural. Heno y Cebada	pirhuani) [110] 15] [Anuali Forraje Avena	4 6 Pirhuzpirhuani 0.060 0.060	4 2 Pirhuapirhuani 0.100 2 2 2	a 10 10 Natural. Forraie Cebada	10 2.500 2.500						
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re area Distance from rox, pasturage zone to	1.1	0.500	0.020	0.800											
Name of pasturage zone Pasturage area Nombre de la zona de zona		9 de Octubre	4 Barrio 8 de Octubre												
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ö	Sheep Ovino	4		10											
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Summary of livestock survey in the microcuencas

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Summary of livestock survey in the microcuencas Estudio sobre el pastorco en las microcuencas		Location		Santa Rosa (Barrio Villa Hermoza)	Santa Rosa (Barrio José Carlos Maniátegui)	17-Feb-99 Santa Rosa (Barrio Manto Central)	Santa Rosa	21-Feb-99 Santa Rosa												
ary of livest o sobre el p		Date	Fecha	17-Feb-99	17-Feb-99			21-Feb-99												Total
Summ: Estudi		QX X		P-SR-01	P-SR-02	P-SR-03	P-SR-04	P-SR-05						_						

Summary of livestock survey in the microcuencas Estudio sobre el pastoreo en las microcuencas

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			Ū	assification	Classification and Number of Livestock	ber of Li	vestock	Name of pasturage zone	Pasturage area	22	Distance from	Sort of grasses
Ž	•	Location	•	Especies	cies y No. d	y No. de Cabezas	S	Nombre de la zona pastoreo	Area aprox. de	from pasturage	microcuenca to	Especie de pasto
	Fecha	Localidad	Sheep Ovino	Cow Vacuno (Cow Alpaca Pork Vacuno Canelido Porcino		Equine Chicken		zona pastoreo (ha)	zone to (m)	lake (m)	
P-SM-01		21-Feb-99 San Martín										
P-SM-02		21-Feb-99 Alto San Martín	:							A CONTRACTOR		
P-SM-05		21-Feb-99 San Martin	1 .		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		an the second				数にまた	
P-SM-04		21-Feb-99 Alto San Martin	12				· · ·	Manto Central	· · · · 1.250			Natural y Forraje de cebada
P-SM-05		25-Feb-99 Alto San Martin	3					Alto San Martín	0.050			Natural y Forraje de cebada
P-SM-06		25-Feb-99 San Martin William Commence		1	*			Manto Central	0.200			Natural y Forraje de cebada
P-SM-07		25-Feb-99 San Martin						3				
P-SM-08	-08 25-Feb-99 San	San	. 6		-			Manto Central	0.100			Natural y Fortaje de cebada
P-SM-09		25-Feb-99 San Martín				5		Manto Central	0.010			
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P-SM-11		San Martin	9	2				Manto Central	0.500			Natural y Forraje de cebada
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			Area aprox. de par zona pastoreo		S.S 2.S	3.5	0.8	2.0	0.3		3.5	1.0	4,0	6.0							<u>NYX</u>	00 YOU
		c zone	Nombre de la zona pastoreo		Cancharani	Alto Manto	Alto Manto	Cancharani	2 Cancharani	and the second secon	Cancharani	Cancharani	Cancharani	Cancharani	and the second	and the second						· · · · · · · · · · · · · · · · · · ·
Alto Manto				Equine Chicken	ter en en	/			3													 (
		nd Number of L	y No. de Ladezas	idd Porcino E	a de la companya de l	· 3 · · · · · · · · · · · ·		- 20	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					.3				a an an a a a a a a a a a a a a a a a a				
)		Classification and Number of Livestock	- F	Cow Alpaca Pork Vacuno Canelido Porcino			6				2			4				 				•
in Cas				Sheep Ovino		30		20		ing and the second s	21	9	· · · · · 15	30								0 8
Summary of livestock survey in the microcuencas	Estudio sobre el pastoreo en las microcuencas		Location	Localidad	Aanto	danto	danto	Alto Manto (Sector Cancharani)	Alto Manto (Sector Cancharani)	Aanto	Alto Manto (Sector Cancharani)	Alto Manto (Sector Cancharani)	Alto Manto (Sector Cancharani)	Aanto		a a sur a sur a sur a sur a sur			an a state a state a state a st			
of livestock su	bre el pastore		Date	Fecha	17-Feb-99 Alto Manto	17-Feb-99 Alto Manto	17-Feb-99 Alto Manto	17-Feb-99 Alto N	17-Feb-99 Alto N	17-Feb-99 Alto Manto	17-Feb-99	17-Feb-99 Alto N	17-Fcb-99 Alto N	17-Feb-99 Alto Manto								TT
Summary	Estudio sc		°Ż		P-AM-01	P-AM-02	P-AM-03	P-AM-04	P-AM-05	P-AM-06	P-AM-07	P-AM-08	P-AM-09	P-AM-10								

N.	vasto	:		cha														4			Ì
Sort of grasses	Especie de pasto		Natural y cebada	Natural, Forraje Avena		Natural	Natural											the second s			
Distance from	microcuenca to	(m)																			Provided to construct on the construction
Distance		zone to (m)	Same and the second																		
Pasturage area	Area aprox. de	(ha)	0.1.0	1.0		0.2	2.0									, ¹	 · · · · · · · · · · · · · · · · · · ·	المعادية والمحادثة			
Name of pasturage zone	Nombre de la zona	puscorco	Punanagui	Punanagui	a su	Punanagui	Huayna Pucara						and the second			and the second	a and a second	and the second		ne - Anna - A	
	Z	Chicken		<u>P</u> .	4		Ŧ				,			¥ .						ine in the second second	
of Livestock	oezas	Equine Equino				-	• 4: 4:					~~~~								n or the successful of	
Number	No. de Ca	a Pork to Porcino	N 2010 101 101 101				1													· · · · · · · · · · · · · · · · · · ·	
Classification and Number of	Especies y No. de Cab	Cow Alpaca Pork Vacuno Canelido Porcino		-		4													. . 		
Classifi	ш			4		5	10		 					7	-		 -			and and the second second	
		Sheep																		and property and	
	Location	Localidad	Huavna Pucara Sector Punanagui	Huavna Pucara Sector Punanagui	Huavna Pucara Sector Punanagui	Huavna Pucara Sector Punanagui	ucara	-	the second s	non-search and the search and the se										and a grant of the state of the second state of the second state of the second state of the second state of the	
																				and the second second second	
•	Date	Fecha	20-Feb-99	20-Feb-99	20-Feb-99	20-Feb-99	20-Feb-99							an a				A		a na sa	
	o Z		10-Hd-d	P-PH-02	P-PH-03	P-PH-04	P-PH-05					:									1

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Capullani

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Summary of livestock survey in the microcuencas Estudio sobre el pastoreo en las microcuencas

Ŀ	Sort of grasses	Especie de pasto	•	ıral	Natural Heno Cebada	Pasto natural H en o Cebada	Iral	Natural y Forraje avena		Natural y Forraje avena	ural	Natural y Forraje avena Cebada		Natural y Fortaje avena	Natural y Forraje avena	Natural Heno de Cebada							
. Not necessary to entry	c Distance from	1 N.	n) (m)	Natural	and Nature	Paste	Natural	Natu		Natu	The Natural	nten States and a states and	Natural	Nature Nature	Nature Nature Nature	RIFN					်းစည်း ကို ကို ကို ကို ကို ကို		
	Pasturage area.	Area aprox. de pasturage	zona pastoreo zone to (ha) (m)	3.0	15.0	15.0	15.0	15.0		1.0	0.5	700.0	2.0	3.0	0.7	0.8							771.000
	Name of pasturage zone	Nombre de la zona	pastoreo	Capullani	l Jaruma	Jaruma	Jaruma	Jaruma		Capullani	Capultani	Fundo Jaruma	Capuliani	Capullani	Capullani	Capullani							
	×	A CARLER OF	Chicken Aver du cerrul	4	1					: 4	an and a second			2	-	5 - -		-	 	 			0
Capullan	id Number of Livestock	Especies y No. de Cabezas	Equino								and the second			2	· · · · ·						2 1		2 0
	Number	Vo. de Ca	aca Pork lido Porcino	5	2	7 : 23	2 L				2	2						-			•		
	ttion and	pecies y'	Cow Alpaca Vacuno Canelid	6				6		2	ود المردية م	0 15	- - -	4	2								5 35
	Classification an	Es	V Cow		92 22	50 50 10	0			7	5	0 0 20		22	5	20			 			1	3 86
ncas	ļ		Sheep Ovino		6	5	001	100					15		· · · · · · · · · · · · · · · · · · ·	1 3						-	573
Summary of livestock survey in the microcuencas Estudio sobre el pastoreo en las microcuencas		Location	Localidad									and the second secon											
ock survey astoreo en l				Capullani	Capullani		Capullani	Capullani	Capullani	Capullani	Capullani	Capullani	Capullani	Capullani	18-Feb-99 Capullani	Capullani					-	1 4 - - - -	
ry of livest sobre el p:		Date	Fecha	18-Fcb-99	18-Fcb-99	18-Fcb-99	18-Feb-99	18-Feb-99 Capullani	18-Feb-99 Capuliani	18-Feb-99 Capultani	18-Fcb-99	P-CA-09 18-Feb-99 Capullani	18-Feb-99 Capullani										- Total
Summa Estudio		Nc		P-CA-01	P-CA-02	P-CA-03	P-CA-04	P-CA-05	P-CA-06	P-CA-07	P-CA-08	P-CA-09 ب	L	P-CA-11	P-CA-12	P-CA-13				- - - -			

ummar Sstudio s	y of livesto iobre el pa	Summary of livestock survey in the microcuencas Estudio sobre el pastoreo en las microcuencas	S			Ja	Jayllihuaya (No.1)	(No.1)			. Not necessary to entry	entry	
	ſ		Clav	sification	and Nur	Classification and Number of Livestock	'estock	Name of pasturage zone	Pasturage area			Sort of grasses	
Ň	Oate	, Arstian		Especi	Especies y No. o	de Cabezas		de la zona	~	Distance Irom pasturage zone	Distance from	Especie de pasto	
24	Fecha		Sheep V	Cow A Vacuno 3	Alpaca 1 anclidd Po	Pork	Equine Chicken Equino Amarum	pastoreo	zona pastoreo (ha)	to microcuenca (m)	lake (m)		
P-JAY-01	22-Feb-99	Javllihuava (Sector Alto Javllihuava)	2	7		-		Alto Javllihuaya	1.500			Natural	
	22-Feb-99	Javliihuava (Sector Alto Javlihuava)		 	 .	4							
	22-Feb-99							Alto Jayllihuaya	0.200			Natural Heno Cebada	
P-JAY-04	22-Feb-99	Javliihuava (Afto Javilihuava)			 								• .
P-JAY-05	22-Feb-99	Jayllihuaya (Alto Jayllihuaya)	 	 					-				
P-JAY-06		Javilihuaya (Sector Alto Javilihuaya)			 -								
P-JAY-07		Javllihuava (Sector Alto Javllihuava)											
P-JAY-08	ł.		8	 .				Alto Jayllihuaya	0.500			Natural	· . .•
P-JAY-09				17			- 1	Alto Jayllihuaya	1,000			Natural	
P-JAY-10		22-Feb-99 Javliihuava (Sector Pantine)		-	-			and the second					
LI-YAL-4	22-Feb-99									23 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	8.2.5.8 A		
P-JAY-12	23-Feb-99	Jayllihuaya (Sector Yanamirre)					· · · · · · · · · · · · · · · · · · ·		e toda - en en en				
P-JAY-13						-							
P-JAY-14			01				100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100	Alto Yanamirre	000.1	a success and a success of the succe		Natural	•
P-JAY-15	23-Feb-99	Jayllihuaya (Sector Yanamirre)	s	1		1	- 	Alto Yanamirre	000.1			Natural	
	23-Feb-99	23-Feb-99 Jayliihuava (Sector Yanamirre)	2	 	 		1	Alto Yanamirre	1.000			Natural	
	23-Feb-99	Jayllihuaya (Sector Yanamirre)	50	п			: 	Alto Yanamirre	4.500			Natural	
P-JAY-18	23-Feb-99	Jayllihuaya (Sector Yanamirre)									19 2 2 2 2 C		
P-JAY-19	1 :		15	4				Alto Yanamirre	1.500		N S N S S	Natural, Fortaje	•
P-JAY-20	23-Feb-99	Jayllihuaya											
P-JAY-21	23-Feb-99	Jayllihuaya (Sector Yauruyo)											*. •
P-JAY-22	i !			Ci				Alto Yanamirre	1.000			Natural, Forraje Cebada	
	Sub-total		118	14	0	· · [[]	6	0	13.200				· ·

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Jayllihuaya (No.2) Summary of livestock survey in the microcuencas Estudio sobre el pastoreo en las microcuencas

Estudio	sobre el pas	Estudio sobre el pastoreo en las microcuencas					•				New	_
			Classific	Classification and Number of Livestock	Number of	(Livestoc		Name of pasturage zone	Pasturage area	Distance from	Distance from	Sort of grasses
SN N	Date		ш	Especies y No. de Cabezas	lo, de Cab	ezas		Nombre de la zona			microcuenca to	Especie de pasto
	Fecha	localidad	Sheep Cow Ovino Vacuno	/ Alpaca	Alpaca Pork anelido Porcino	Equine Equino	Chicken	pastorco	ZORA PASOTCO	to microcuenca (m)	(m)	
P-JAY-23	23-Feb-99	Javilihuava (Sector Incapujio)	:		•					10.00 C	1. S. S. S. S. S.	
P-1AY-24		23-Feb-99 Javliihuava (Sector Incapuiio)									日本の必要	
P-JAY-25		Javliihuava (Sector Incaputio)	10	6				Incapujio	005.1			Natural y Forraje Cebada
P-JAY-26	1.1											5
P-JAY-27	Į	23-Feb-99 Javilihuaya (SectorPueblo)		-								
P-JAY-28		23-Feb-99 (Jaylihuava (SectorPueblo)								的复数感觉	後後を学会	
P-JAY-29	ļ	Javliihuaya (Sector Aziruni 111)										
	.								-			
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									and a second second		1990 (M. 1990)	
			-	- - -		:					a second	
	ъ.				•.							
	Sub-total		10 miles	5		0	0		1,500			
	Total		128	16	2 J	6	0		14.700			

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o entry	Sort of grasses	Especie de pasto		Totora, Forraje de Cebada (Ovino, Vacuno)	Totora	Raices de Totora	Raices de Totora	Totora, Forraje Cebada	Totora, Forraje Cebada	Totora	Totora	Totora. Forraje Totora	Totora	Totora	Market Totora, Forraje Cebada	Natural y Totora	
Not necessary to entry	Distance from	microcuenca to	(m)										Totora				The second se
	Distance		zone to	Sector Sec						10 00 00 00 00 00 00 00 00 00 00 00 00 0	100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 100 - 100				10-2010-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-		and the second se
	Pasturage area	Area aprox. de	Contra presioner	0.1	1.0	0.1	0.1	0.2	0.5	0.1	0.5	0.5	0.1	0.2	1.0	1.0	
	Name of pasturage zone	de la zona	puscorco	Orillas del Lago Titicaca	Orillas del Lago Titicaca	Orillas del Lago Titicaca	Orillas del Lago Titicaca	Orillas del Lago Titicaca	5 Orillas del Lago Titicaca	Orillas del Lago Titicaca	Orillas del Lago Titicaca	Orillas del Lago Titicaca	Orillas del Lago Titicaca	Orillas del Lago Titicaca	Orillas del Lago Titicaca	Orillas del Lago Titicaca	
	×						******		S	1							
Chimu	and Number of Livestock	CZ3S	Equine Chicken							-				,			
	umber of	o. de Cab	Porcino			8	v,			1		1. 1. No.					
	on and N	Especies y No. de Cabezas	Cow Alpaca Pork Vacino Canelido Porcino		-		* : :										
	Classification	Espe	Cow	6	- - -		4 	5	3		1	2		. 2			
S	Ū ,		Sheep Ovino	с С С	S		:		7	2		'n	2	5	15	10	
Summary of livestock survey in the microcuencas Estudio sobre el pastoreo en las microcuencas		Location	Localidad	24-Feb-99 Javilihuaya (Villa San José)	24-Feb-99 Chimú (Sector Villa San José)	24-Feb-99 Chimú (Sector Villa San José)	24-Feb-99 Chimú (Sector Villa San José)	24-Feb-99 Chimú (Sector Villa San José)	24-Feb-99 Chimú (Sector Villa San José)	24-Feb-99 Chimù (Sector Villa San José)	24-Feb-99 Chimú (Sector Villa San José)	Chimú (Sector Villa San José)	Chimú	Chimú (Burrio Central)	Chimú	24-Fcb-99 Chimú (Vallecito)	
y of livesto sobre el pa		Date	Fecha		L							· 24-Fcb-99	24-Fcb-99	24-Fcb-99	24-Fcb-99		
Summar Estudio s		No.		P-CHI-01	P-CH1-02	P-CHI-03	P-CHI-04	P-CHI-05	P-CHI-06	P-CHI-07	P-CH1-08	P-CH1-09	P-CHI-10	P-CHI-11	P-CHI-12	P-CH1-13	

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							ប	Classification and number of Livestock	und brie ni	nber of L	ivestock								Pasturage Area	Vrea
								Espec	Especies y No. de Cabezas	de Cabez	SG									
Chence of Milcro		Sheep			Cow			Alpaca			Pok		Ч	Equine		Ч С	Chicken	Arca ap	Area aprox. de zona pastoreo (ha)	pastoreo (ha)
		Ovino			Vacuno			Canelido		đ	Porcino		E	Equino		Aves (Aves de corral			
	Survey	Survey Percentage Number		Survey	Survey Percentage Number		Survey Percentage		Number S	Jurvey Pe	Survey Percentage Number		Survey Pe	Percentage Number		Survey Percentage	centage Number	er Survey	y Percentage	Arca
l Huaje	231	92.4%	250	54	83.1%	65	25	83.3%	30	27	48.0%	56	2	25.0%	8	30 7:	75.0%	40 14.5	5 67.8%	21.0
2 Dos de Mayo	44	\$\$.0%	50	4	66.7%	9	10	83.3%	12	4	20.0%	20	0			30] 54	50.0%	60 6.5	5 51.3%	13.0
3 Ventilla	657	93.9%	700	4	61.3%	153	12	24.0%	50	9	12.0%	50	5	20.0%	10	12 2	24.0%	50 101.2	2 39.2%	258.0
4 Orkopata	14	70.0%	20	0			0			6	20.0%	30	0			4	40.0%	10 1.3	3 21.7%	6.0
5 Pucamayo	10	10 14.3%	70	4	40.0%	10	0			8	32.0%	25	0			ò		2.6	6 14.4%	18.0
6 Chacarilla	65	92.9%	70	0			0			0			0			0		6.0	0 15.5%	39.0
7 Santa Rosa	52	86.7%	. 60	0			0			5	33.3%	15	1	50.0%	- 2	0		2.9	9 28.3%	10.0
8 San Martin	27	77.1%	35	3	60.0%	5	0	-		2	8.0%	25	0			3		2.1	1 24.2%	9.0
9 Alto manto	178	89.0%	200	6	22.5%	40	13	52.0%	25	0			0			2 2	20.0%	10 24.6	6 30.6%	80.0
10 Huayna Pucar	36	80.0%	45	1	10.0%	10	2	40.0%	5	2	8.0%	25	0			4 2(26.7%	15 4.2	2 27.5%	15.0
I Capullani	573	36.2%	1583	86	43.0%	200	35	20.8%	168	2	13.3%	15	0			15 SI	50.0%	30 771.0	0 27.2%	2.833.0
12 Jayllihuaya	128	8.5%	1500	16	5.3%	302	0			7	35.0%	20	6	60.0%	10	0		14.7	7 18.1%	81.0
13 Chimu	49	3.0%	1633	12	15.0%	80	0			12	40.0%	30	0			5 2:	25.0% 2	20 4.5	5 13.8%	33.0
1																		at mark		
Total	2,064		6,216	283		871	67		290	18		311	11		30	105	235	5 956.1	1	3416.0

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Estimation of pollution load generation by livestock

Oreanic Matter (BOD)

	S	beep	6	ow	Al	208	1	^о в	Total
	(head)	BOD (kg'd)	(bead)	BOD (kg/d)	(head)	BOD (kg/d)	(head)	BOD (kg'd)	80D (kg'd)
1 Huaje	25	15.0	65	3.9	30	1.8	56	3.9	24.6
2 Dos de Mayo	54	3.0	6	0.4	12	0.7	20	. 1.4	· · · · S.
3 Ventilla	70	42 0	153	92	50	3.0	50	3.5	57.
4 Orkopata	2	0 - 12	0	0.0	0	0.0	30	- 2.1	3.
5 Pucamayo	. 7	42	10	0.6	0	0.0	- 25	1.8	6
6 Chacarilla	7	0 . 42	0	0.0	0	.: 0.0	O	0.0	4
7 Santa Rosa	6	0] . 3.6	· · · · · · · · ·	0.0	0	0.0	1 5	· · · 1.1	- 4.
8 San Martin	3	5 21	1	03	0	0.0	25	1.8	4
9 Alto manto	20	0 120	40	24	25	1.5	0	0.0	15.
10 Horyea Pocara	4	5 27	10	0.6	5	03	25	1.8	5.
11 Capullani	158	3 95.0	200	12.0	168	10.1	15	1.1	118.
12 JayBibuaya	150	0 3 90.0	302	18.1	C	0.0	20	1.4	109.
13 Chimu	163	3 93.0	80	4.8	0	0.0	30	21	104
ભર્ય	621	6 373	871	52 3	290	17.4	8 - 8 3 11	22	46-
itrezen (T-N)					1111	1 2 2 7	1.1.1.1		

Nitropen (T.N)

	She	ep	Co	w i	Alp	362	- H	og	Total
	(head)	T-N (kg/d)	(head)	T-N (kg/d)	(head)	T-N (kg/d)	(head)	T-N (kg/d.)	T-N (ke'd.)
l Heaje	250	6.8	65	0.8	30	0.8	56	1.0	9.4
2 Dos de Mayo	50	1.4	5. and 6	0.1	12	0.3	- 20	0.3	21
3 Ventilla	700	18.9	153	1.8	50	1.4	50	0.9	23.0
4 Orkepata	20	0.5	0	0.0	0	0.0	30	0.5	1.0
5 Pucamayo	70	19	10	0.1	0	0.0	25	0.4	2.4
6 Chacanilla		1.9	. 0	0.0	0	0.0	0	0.0	1
7 Santa Rosa	60	1.6	0	0.0	0	Ò.0	15	0.3	1.9
8 San Martin		0.9	5	0.1	0	0.0	25	0.4	1.4
9 Alto manto	200	5,4	40	0.5	25	0.7	0	0.0	6.0
10 Huayna Pucara	45	1.2	10	0.1	5	0.1	25	0.4	1.
11 Capullani	1583	42.7	200	2.4	168	4.5	в	03	49.9
12 Jayfahuaya	1500	40.5	302	3.6	0	0.0	20	03	44 (
13 Chimu	1633	44.1	80	1.0	0	0.0	30	05	45.6
Total	6216	167.8	871	10.5	290	7.8	311	5.3	191

Phesphorus (T-P)	 •

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· · · · · ·	Sh.	cep	C	ow	Alç	aca	H	18	Total
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(head)	T-P (kg'd)	(head)	T-P(lg'd)	(bead)	T-P (kg'd)	(head)	T-P(kg'd)	T-P (kg'd)
1 Huaje	250	18	65	0.5	30	02	56	0.4	2
2 Dos de Mayo	50	0.4	6	0.0	12	0.1	20	0.1	² 0,
3 Ventilla	700	4.9	153	2 2 1 4	50	0.4	50	0.4	. 6
4 Orkopata	20	0.1	0	0.0	0	0.0	30	02	·. 0
5 Pucamayo	70	0.5	10	0.1	0	0.0	25	0.2	· · 0
6 Chácarilla	70	0.5	0	0.0	0	0.0	0	0.0	C
7 Saraa Rosa	60	0.4	0	00	0	0.0	15	0.1	1 · · · 0
8 San Martin	35	0 2	5	0.0	0	0.0	25	0.2	
9 Alto manto	200	1.4	40	0.3	25	02	0	0.0	1.1
0 Huayna Pucara	45	0.3	10	0.1	5	00	25	02	(i i i i i i i i i i i i i i i i i i i
H Capullani	1583	11.1	200	L4	168	12	15	0.1	1.10.13
2 JayBihuaya	1500	10.5	302	21	0	0.0	20	0.1	1
3 Chimu	1633	11.4	\$0	0.5	0	0.0	30	0.2	់រះ
Tetal	6216	43.5	871	62	290	21	311	2 2	

Unit pollution load (ghead/day)

	BOD	1-22	1-1-12
Sheep	60	27	7
Cow	60	12	7
Alpaca	60	27	7
Beg	70	17	7

Questionnaires

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<u>C2</u>	tudio sobre el pastoreo en	.199 10101000000	ivad	2.5 1
	•			•
1.	No. <u>P-</u>			
2.	Fecha			
3.	Localidad			
4.	Especies y No. de Cabezas	Ovino	, Procino	· · · · · · · · · · · · · · · · · · ·
		Vacuno	, Equino	
•••		Canélido	, Aves de corral	
5.	Nombre de Propietario(a)			
6.	Distancia hasta la zona de pasto	reo	km	
7.	Nombre de la zona de pastoreo			
8.	Area aprox. de zona pastoreo		· · · · · · · · · · · · · · · · · · ·	
9.	Especie de pasto			

Estudio sobre área de cultivo y variedades cultivadas

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1. No. C-2. Fecha 3. Localidad Cultivo 4. kg No. de Sacos 5. Producción Arroba 6. Nombre de agricultor(a) <u>ha, m2</u> 7. Area total Area apta para cultivo ha m2 8. <u>ha. m2</u> 9. Area cultivada 10. Epoca de siembra y cosecha 11. Abono (Tipo y cantidad) 12. Insecticida (Tipo y cantidad)

4. DATA CONCERNED TO SOLID WASTE MANAGEMENT

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I. DATA CONCERNED TO THE COLLECTION AND TRANSPORTATION

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INTRODUCTION

The microbasin of Puno has a 5,699.6 has. Surface (PELT, 1999). It is located among the 3,809 m., the lacustrine coast level, and the 4,500 m. height, the highest point marked by Hill Putina's summit.

The water divide that marks the microbasin limit has 51.99 km. long, and the lacustrine coast line has approximately 16.5 km long. The total perimeter of the microbasin is 68.5 km. (values calculated by planimetric measure).

The hills surrounding the microbasin have very steep slopes which fluctuate among 25 and 37 slope degrees. The adjacent or near areas to the bay can reach a slope near to 0 degrees, being their average 5.2%, in some sites.

Puno City, located inside the microbasin, is an urban place with the largest population concentration in the Peruvian lacustrine coast. It is also the nodal center of the transoceanic way.

Activities generated by construction credits have encouraged the urban development in the city, and also the constructions of commercial centers and houses.

Nowadays, Puno bears the most important national and international tourist flow of the highland with approximately 120,000 tourists per year. This represents a 14% of the national tourism activity (in accordance with one Tourist Information Official from INEI).

This has caused a bigger demand of services, of specially those related to the environmental improvement and to the solid residuals treatment.

Due to the characteristics that presents this study area, solid residuals are spilled into the lake in a directly and indirectly way, which causes serious problems to the ecology, to the environmental health and to the landscape aesthetics with the consequent devaluation of cultural and landscape heritage of the highest navigable lake in the world.

1 CONCEPTUAL BACKGROUND

Cleaning Campaigns

These are the activities that are carried out apart from public cleaning normal service in areas where refuse collecting service do not work regularly. It includes refuse collecting in solid residual clandestine accumulation places.

Gathering Points

These are the places where sweepers, tricicleros (people who gather refuse inside trycicles) and wheelbarrow men accumulate street refuse in order to be collected and trasported to the sanitary landfill by collecting trucks.

Accumulation

It is the process for which tricicleros and wheelbarrow men collect refuse in a gathering point or dump.

Dump

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Places where refuse is accumulated in a free and direct way without any technical handling are called dumps. A dump is clandestine when municipal governments do not accomplish a regular collecting of accumulated refuse. Collecting in these clandestine dumps is accomplished by means of cleaning campaigns planned each 15 or 30 days.

Construction and Demolition Waste

Waste products of building industry. Construction and demolition waste is not considered a solid residual by public cleaning workers; for this reason it is not collected.

Refuse Dispersion

It is due to transport agents such as graveness, wind, water, animals and human beings. Dispersion is a process for which refuse extends its alteration in a natural or urban landscape.

Transport Processes

These are the ones originated as of transport agents such as: eolic process.- refuse transport by means of the wind.

Topographical Medium

In a microbasin, a topographical medium is a modifier of the acting form of agents and of processes manifestations.

Climatic Environment

Climatic crises have generated a resistant environment in this microbasin; therefore, current erosive processes originated by rains and superficial water flows are very violent.

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2 TIME AND MATION STUDY DESCRIPTION

It consists in determining the duration or time employed by a collecting truck during its run or route in a work day for collecting in gathering points and also for residual domiciliary collecting.

The objectives for being fulfill are:

- Establishment of the route accomplished by a collecting truck.
- Determination of the time employed by the collecting truck in accomplishing its work route.
- A speed measure by kilometers per hour record traveled in each route.

Participating personnel:

7 Economical engineering students from the Universidad Nacional del Altiplano. 1 Study Manager.

Materials and Methods

Materials:

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A survey format.

- Scale maps 1:10,000 and 1:50,000.
- Chronometers, boards and stationery.
- Transportation (double cabin station wagons, double traction station wagons).
- Information about routes provided by Puno's Municipal Government.

Method:

Among November 19th. and 30th. the participating student selection and training was carried out.

Procédure

Training consisted on imparting knowledge on:

- Objectives and characteristics of the study and its importance.
- General notions about projects. The project applied to solid residuals, solid residual concept, recycling, sanitary landfill. The collecting processes, transport and final disposal.
- Cartography notions, map management, thematic map, scale calculation.

The city, the urban morphology, its structure and configuration, vehicle flow and accessibility.

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Tasks assignment and organization

Work organization:

Due to the existence of 4 collecting trucks, it was constituted 4 work groups; 2 students for each vehicle. Each group had to copy the route accomplished by the assignated vehicle on Tuesdays. Wednesdays and Thursdays.

مربوعة والمراجع

On Saturdays 21st. and 28th. and on Sunday 29th. of November 1998 it was carried out travels to different places of the city by means of that area means of transportation. The students verified:

- Gathering points and clandestine dumps.
- Nomenclature and numeration of streets.
- Cartographic information provided by the municipal government.

On November 30th. 1998 at 3:30 it was started the training last stage which finished at 2:00 p.m.

Students guided by the Study Manager carried out the pursuit of the compactor vehicle Nº 1 testing a way of fill out the formats.

In the evening (from 7:00 p.m. to 10:00 p.m.) the work was discussed and doubts and disquiets were solved. The Project Manager suggested some strategies to obtain a good information.

On December 1st., 2nd., and 3rd. 1998 it was accomplished the respective work according to what is indicated on the given planes and formats.

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	CLIMATE CONDITION		GOOD	Good	GOOD	GOOD	CLOUDY	сгоиру	сголру	croupy	COOD	0 0 0 0 0 0
	DATE		01/12/98	01/12/98	01/12/98	01/12/98	02/12/98	02/12/98	02/12/98	02/12/98	03/12/98	03/12/98
	ral. Ues	TOTAL DISTANCE	48.0 Km	46.9 Km	48.8 Km	46.0 Km	45.05 Km	52.0 Km	60.0 Km	50.6 Km	49.4 Km	61.0 Km
	TOTAL	TOTAL	8h 02' 48"	. 7h 51' 39"	7h 29' 05"	8h 55' 28"	7h 55' 51"	8h 31' 15"	7h 38' 44"	9h 12' 09"	8h 57' 32"	8h 00' 10"
TIME AND MOTION STUDY		DISTANCE	25.0 Km	21.85 Km	21.2 Km	21.7 Km	23.0 Km	24.8 Km	33.8 Km	27.3 Km	21.9 Km	36.0 Km
	OND PERIOD	TRAVELED	3h 31' 13"	4h 16' 15"	3h 24' 40"	Sh 57' 44"	3h 43' 27"	3h 57' 58"	4h 14' 34"	5h 45' 09"	3h 41' 31"	4h 28' 39"
	ES:: IN THE SECOND PERIOD	END TIME	12h 29' 56"	11h 58° 20°	12h 03' 00"	13h 47' 55"	11ĥ 46' 00"	12h 53' 05"	12h 20' 14"	13h 49' 30"	13h 07' 47"	12h 14' 40"
θF	ANCE VALU	BEGENING	8h 58' 45"	7h 42' 05"	8h 38' 20"	8h 31' 05"	8h 02' 33"	27.2 Km 8h 55' 07"	26.2 Km 9h 34' 28"	8h 04' 21"	9h 26' 16"	8h 13' 03"
3 TABLE RESUME	TIME AND DISTANCE VALUES	DISTANCE TRAVELED	23.0 Km	25.05 Km	27.6 Km	24.3 Km	22.05 Km	27.2 Km	26.2 Km	23.3 Km	27.5 Km	25.0 Km
3 TABL	TI IN THE FIRST PERIOD	TRAVELED	4h 31, 35"	3h 35' 24"	4h 04' 25"	3h 57' 44"	4h 02' 24"	4h 33' 17"	3h 24' 10"	3h 27' 00"	5h 16' 01"	3h 31' 31"
	IN THE FIR	END	8h 43' 50"	7h 39' 45"	8h 17' 10"	8h 08' 22"	7h 55' 26"	8h 40' 47"	7h 35' 50"	7h 39' 20"	9h 21' 05"	7h 39' 32"
		BEGENING TIME	4h 11' 05"	4h 04' 21"	4h 12' 45"	4h 10' 38"	3h 53' 02"	4h 07° 30°	4h 11 [•] 40"	4h 12' 20"	4h 05' 04"	4h 07' 51"
	GARBAGE TRUCK	NUMBER	-	2	R	4	•• ••• •• •• ••	N	Ю		2	ę

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