## Feeding and feed management of Indian major carps in Andhra Pradesh, India











## Contents

Prepar	ation of this document	111
Abstract		
Abbre	viations and acronyms	vii
1. Intr	roduction	1
1.1	The Kolleru Lake	3
1.2	Water sources	5
1.3	Organic manures and inorganic fertilizers	5
1.4	Electricity	5
1.5	Sources of finance	6
1.6	Insurance services	7
1.7	Regulations	7
1.8	Feed and nutrition research capacity	9
1.9	The carp culture systems used in andhra pradesh	9
1.10	Semi-extensive polyculture of indian major and exotic carps (initial cultur	e) 12
1.11	On-growing semi-intensive polyculture (typical culture)	12
1.12	2 Semi-intensive polyculture fattening (zero point culture)	12
1.13	3 Semi-intensive juvenile polyculture (zero point stock culture)	13
1.14	Polyculture grow-out systems (semi-intensive polyculture and mixed)	13
	Nursery, juvenile and broodstock systems	14
2. Me	thods	17
2.1	Regional distribution of the farmer survey	17
2.2	Limitations of the study	19
2.3	Data analysis	19
3. Res	sults and discussion	21
3.1	Farm size	21
3,2	Farmers' experience	22
	Production characteristics	22
3.4	Manufactured pelleted feeds	28
3.5	The types of feed used by the farmers	30
3.6	Nutrition and feed management of indian major carps under practical semi-intensive pond culture conditions	32
4. Far	mers' perceptions	51
4.1	Feed quality related problems	51
4.2	Rope or pole feeding	53
4.3	Feeding and feed consumption	54
4.4	Feed wastage	56
4.5	Gut evacuation time	58
4.6	The contribution of natural feeds to fish growth	58
4.7	Growth retardation	61
4.8	Satiation or sub-satiation feeding	63
4.9	pellet types	63

4.10 M	anı	ires and fertilizer use	63
4.11 Co	ost	of production and net income	66
5. Conclusions and recommendations			
5.1 Cc	oncl	usions	69
5.2 Re	cor	mmendations	70
Referenc	es		73
Annexes			
Annex 1	0	Common and scientific names of fish species used in aquaculture in Andhra Pradesh, India	81
Annex 2	22	Antibiotics and other pharmacologically active substances prohibited for use in Indian aquaculture	82
Annex 3	e	Annual production capacity of the 11 largest commercial pelleted feed manufactures and local feed factories in Andhra Pradesh, 2010	83
Annex 4		Products of the pelleted feed manufacturers in Andhra Pradesh	84
Annex 5	-	Manure and fertilizer use in "typical culture (on-growing semi-intensive polyculture)" production system"	85
Annex 6	=======================================	Manure and fertilizer use in "zero point culture (semi-intensive polyculture fattening) and zero point stock culture (semi-intensive juvenile polyculture)" production systems	9.6
Annex 7	-	Manure and fertilizer use in a "polyculture grow-out (IMC and exotic carp)" production system	86
Annex 8	_	Manure and fertilizer use in "polyculture grow-out (IMC and tiger shrimp)" production system	88
Annex 9	-	Manure and fertilizer use in a "polyculture grow-out (IMC and giant river prawns)" production system	89
Annex 10		Input and fish sale prices used to estimate production costs and net incomes (july 2010)	90