



OFFICE MEMORANDUM

TO: Crocodile Research Group - Members

DATE: March 27, 1980

FROM: *f* *SD* Dr. H. R. Bustard

SUBJECT: Wildlife Development in Rural India

CIRCULAR - 1

1. The Andhra Pradesh Forest Department *with* association with the Andhra Pradesh Agricultural University and FAO are conducting an International Symposium on "Wildlife Resources in Rural Development".
2. This meeting, which will have international attendance will be held in Hyderabad during the last week of June 1980.
3. The main topic of the meeting will be given in the next circular. However, I will be interested:
 - a) to hear from those of you who may wish to present a paper at this meeting, and,
 - b) to have an abstract of the proposed paper (approximately 100 words) as soon as possible and preferably by return post. All such papers should be *in* the lines with the main symposium topic and there is no place for straight crocodile or ecological papers.



OFFICE MEMORANDUM

TO: Crocodile Research Group - Members

DATE: March 27, 1980

FROM: Dr. H. R. Bustard

SUBJECT: Suggested Topics

Wildlife Development in Rural India

Circular - 2

1. I have decided to offer the topic on crocodile farming in rural India (which is expected of me!).
2. Binod Choudhury is offering the topic:
"Reptile ^{Resources} ~~Research~~ and their Management in Rural India."
3. I had thought that Singhlet might like to get a topic along the lines of:
"Sanctuary Management as a Tool in Rural Development."
This with stress on return available to the rural section from a well managed sanctuary could include associated farming and cropping activities as well as recreational and tourist and other uses of the sanctuary area.
4. For Sudhakar I had thought of a topic along the lines of:
"A Saltwater Crocodile Project and Sanctuary Development in Rural Orissa - A case history."
5. For Chandrasekhar the obvious topic would be:
"The Role of the Pacific Ridley Sea Turtle in Rural Development."
6. These are suggestions only. You may send in your comments in due course.
7. The third circular will follow shortly.



OFFICE MEMORANDUM

TO: Crocodile Research Group - Members

DATE: April 25, 1980

FROM:

H. R. Bustard
Dr. H. R. Bustard

SUBJECT:

Wildlife Development in Rural India

Circular - 3

1. Kindly refer to my circulars 1 and 2 on the above topic.
2. The official closing date for receipt of papers for the above workshop is 15th May.
3. Till date I have not received any positive response from any of you and I am most disappointed indeed.
4. Papers should be sent to the Convener of the Workshop, Mr. Pushp Kumar, Conservator of Forests, Office of the Chief Conservator of Forests, Forest Department, Government of Andhra Pradesh, Saifabad, Hyderabad, with a copy to the Liason Officer, Mr. A. K. Mathur, Addl. CCF Forest Department, Government of Andhra Pradesh.

From:

B. C. Choudhury
Andhra Pradesh Crocodile
Conservation Project
Nehru Zoological Park
Hyderabad 500 264

To:

Mr. Pushp Kumar, IFS
Conservator of Forests
Convener
International Seminar on Wildlife
Resource and Rural Development

Dear Sir,

Sub: Submission of Abstract of the paper
"Reptile Resources in India - their
Conservation and Utilization for
Rural Development".

Enclosed please find two copies of the abstract of
the paper "Reptile Resources in India - their
Conservation and Utilization for Rural Development"
which I intend to present at the International
Seminar on Wildlife Resource and Rural Development
being organised by the APAU/AP Forest Department/FAO.

The completed paper will be submitted before 15 May
1980 the due date for all papers meant for this
symposium.

Thanking you,

Yours faithfully,

(B. C. Choudhury)

cc: Mr. A. K. Mathur,
Dr. H. R. Bustard

REPTILE RESOURCES IN INDIA - THEIR CONSERVATION
AND UTILIZATION FOR RURAL DEVELOPMENT

by

B. C. CHOUDHURY
Andhra Pradesh Crocodile Conservation Project
Nehru Zoological Park
Hyderabad - 500 264

ABSTRACT

Several species of Indian reptiles are in the 'endangered' list because of the continued exploitation for their meat, skin, shell, venom etc. bringing their wild population to critically low numbers. This industry controlled by a few businessmen with vested interests often ignore the conservation aspect. Instead of harvesting rationally, this renewable resource has been mined. To save the existing wild population and to create a healthy industry a substitute Rural Captive Reptile Propagation Programme (RCRPP) has to be developed. Such a network of RCRPP's would reduce pressures on the wild stock while providing substitute material for the industry and ensure the survival of the endangered Indian reptiles. Most important of all, this would help develop an industry in the rural India.

REPTILE RESOURCES IN INDIA - THEIR CONSERVATION
AND UTILIZATION FOR RURAL DEVELOPMENT

by

B. C. CHOUDHURY
Andhra Pradesh Crocodile Conservation Project
Nehru Zoological Park
Hyderabad - 500 264

ABSTRACT

Several species of Indian reptiles are in the 'endangered' list because of the continued exploitation for their meat, skin, shell, venom etc. bringing their wild population to critically low numbers. This industry controlled by a few businessmen with vested interests often ignore the conservation aspect. Instead of harvesting rationally, this renewable resource has been mined. To save the existing wild population and to create a healthy industry a substitute Rural Captive Reptile Propagation Programme (RCRPP) has to be developed. Such a network of RCRPP's would reduce pressures on the wild stock while providing substitute material for the industry and ensure the survival of the endangered Indian reptiles. Most important of all, this would help develop an industry in the rural India.

REPTILES RESOURCES IN INDIA - THEIR CONSERVATION
AND UTILIZATION FOR RURAL DEVELOPMENT

by

B. C. CHOUDHURY
Andhra Pradesh Crocodile Conservation Project
Nehru Zoological Park
Hyderabad - 500 264

ABSTRACT

Several species of Indian reptiles are in the 'endangered' list because of the continued exploitation for their meat, skin, shell, venom etc. bringing their wild population to critically low numbers. This industry controlled by a few businessmen with vested interests often ignore the conservation aspect. Instead of harvesting rationally, this renewable resource has been mined. To save the existing wild population and to create a healthy industry a substitute Rural Captive Reptile Propagation Programme (RCRPP) has to be developed. Such a network of RCRPP's would reduce pressures on the wild stock while providing substitute material for the industry and ensure the survival of the endangered Indian reptiles. Most important of all, this would help develop an industry in the rural India.

Lymphosium - Last-Weeks of June

Wildlife Resource & Rural Development -

Topics (to be seen)

- Crocodile farming in Rural India
HRA

(1976-77 Special week)
in India/Nepal

● Skin - not
Paris - large male - SW - after
for ~~exhibitional~~ purposes

Value of Meat

Price as 1/10 ^{per} number - as good meat -
as Lym

Products

a. Skin
b. Meat - in food
c. other products - medicinal / magical

B.C.C

Reptile Resource ^{& their} management - in
Rural India

J. Kar

Saltwater crocodile project - & similar
development - in Rural areas

C. S. Kar

The role of the Pacific Rolly Sea-turtle
~~Controlled~~ Law in ~~their~~ development

Reptiles, Fish & Conservation

Reptiles - from water to land. Diverse 300 to 200 million years ago. Dominant from till 140 to 120 million years ago. Dinosaur etc. Modern living reptiles are on the rise since 70 million years ago. as are represented by 6000 species.

Marine Turtles

- 1 Hawkbill
- 2 Leather
- 3 Loggerhead
- 4 Green
- 5 Olive ridley

140 years over 500 species in India. M.A. Smith.

Key size
Paddle like legs
Dorsally flattened shell

egg laying on shore & problems 1st year etc.

turtle meat & shell
conservation measures. defense service role

Freshwater Terrapins - Generally hardshelled

stumpy walking with swimming legs also known as mud turtles. huffing on the water. hardshelled to avoid dehydration.

Freshwater softshelled turtles. Flat like the marine ones, softshell, paddle like legs. partly to eat & problems.

Role of Turtles - Scavengers

Consumption of turtles
Land Turtle - Stump. Giant Aldabra extra Indian form

Lizards

- ① Varanus myths
- ② Calotes myths
- ③ Rock lizard
- ④ Skink - myths. Redtail poison etc
- ⑤ Geckos (House, ground, tree etc).
poison etc etc.

Snakes

Snake worship

love & hate snake

burrowing snakes & myths

Pythons - & myths

Tree snakes & myths

Water snakes & sea snakes & myths

Bois fane & King Cobra

Cobra & Snake charmer (no char)

Albino Royal snakes

Rat snake & its utility

Snakes & men usefulness

Rodent control

medicine

Appendix

58 Slides

1. Phythology slides
2. Three Indian ^{crows}
3. Gharial - ^{habitat} - habitat & problems
4. S.W. Crow - ^{habitat} - habitat & problems
5. Merganser - habitat & problem

~~Common problem - killing for, skin
nest robbing
habitat destruction~~

Conservation strategy -
egg collection from two types of nest -
hole nest -
mound nest -

~~Nest identification in ^{hatchery}~~

hatching.

Rearing - ^{hatchling} hatchling part
feeding part.

sexing
sawdust clipping
Releasing

IN INDIA --
REPTILE RESOURCES ~~IN INDIA~~ CONSERVATION AND UTILIZATION

FOR RURAL DEVELOPMENT=

Being a tropical country India is bestowed with a rich reptile fauna. Over two hundred species of Snakes, three species of Crocodilians five species of sea-turtles, over species of terrapins and tortoises and species of lizards and agamids occur in India. ~~Naturally~~ With so many reptiles an image of Snakes/crawling the streets ~~and lizards~~ naturally comes to the minds of most foreigners, at least those who are initiated to think of India in the eyes of Rudyard Kipling or Jim Corbett. Perhaps the situation was so at least five decades ago when traditional snake charmers roamed the streets with their snakes and one was sure to see the world most unique crocodilian the long snouted crocodile Gharial and its related Mugger and Estuarine crocodile in Indian waters as well as the numerous lizards and ~~tu~~ Chelonians. The situation has changed dramatically now and all the three species of Indian crocodiles are in the ' Endangered ' list of IUCN red data book along with all the five species of sea-turtles, one species of lizard and two species of snakes. This has happened because of the large scale commercial exploitation of the reptile resources for their excellent hides, meat, eggs and above all alienation of their habitats. While the reptile resources were depleting ~~the~~ huge profits were being made by a few businessmen by employing means beyond ethical bounds, Indian reptiles have been used as food, for their skin, as medicines, as pets, in show business, for biological research and also for the pharmaceutical uses. For all these uses the consumers depend on the natural population even now. Though the naturally occurring population is now endangered ~~their~~ end to their use is nowhere in sight. What is surprising is the lack of thought of providing (catering) the requirements by captive propagation of reptiles. It is high time to think in these lines and to create an infrastructure in rural India ~~so that~~ ~~for~~ captive propagation of reptiles: ~~cater the needs~~ Besides diminishing the strain from the wild stock and ~~there~~ by assuring the survival of the endangered reptiles such efforts will improve the lot of rural India.

Snakes as food:

Not many people in India will eat snakes though perfectly safe and nutritious. However, the Chakmas and Mizos and other tribals in north east India will kill and eat any large snakes they encounter. Common or not

Traditional:
Snake catchers are basically from local areas.
Traders from Tamil Nadu & AP
Chapurhis - Bengal
Kerka or Keka (Orissa)
Mahra (Meharashtra)
Mal & Sangis &
Turbirwallahs.

CRCRP

for one ^{or two} species depending on ^{local} availability & ^{a the same to some} price
Cobra - J.W. Co. / Ward (North India)
Snake - Ward (All over)
Tutu -
Python -
Vermorel Snake - Ward
Rat Snake & Ward
Other Snake skin Ward
Co-operatives

Caution:

Breeder buying should be supervised by Ward
It should be supervised by Ward
projects -

Breeding references

UROSAURIA

✓ Hoffmann
Mehner & Brabant
David Reuben
W. Zuber R
✓ Burtus H. R.
Yaffner & Reuben

Pythons
Snakes
Acharjyo

Grady

Swif

International Zoo garden W. R.

Sea turtles

Davis
A. S. G.
Whitaker
~~De Witt~~

Reptile names

Smith
Whitaker
Drown

Reptiles as food

- SNAKES -

Whitaker () -

"not many people in India will eat snakes though perfectly safe and nutritious. However the Chakomas and Huzars and other tribes in North-East India will kill and eat any large snake they encounter, venomous or not."

Deoras ()

"Snakes, more especially pythons, are eaten as food in China and Burma. Some people in these areas consider a delicacy. ~~In fact now, even in America and Mexico wild tribes in Madhya Pradesh and NEFA areas also eat snakes.~~" ~~Deoras~~

- CROCODILES -

Bollards - p. 128

Gharial flesh eaten by tribals along Mahanadi
Gokawri
Krisna
Cauvery,

Exploitation

crocodiles

Shales

Turtles

izards.

Jack

Madreya

Whitaker
program

Ashley

Daniel

Bush

Lee

Wiley

Shatney

Proposal for RCRPP

Primate Utilization

FAO (1974)

de Ward (1975)

1978

PIRG (report)

Utai Zangpangakomi 1000 paper

Reference

1. Smith
2. De Ward (1975)
3. De Ward (1978)
4. Burdard (1974) — Operation Glacial.
5. Chappin.
6. Hovaggh
7. Bhatnagar.
8. Primate V.H.
9. Lawson.
10. PNG report
11. Whitaker (book)
12. De Ward (Sudwest India)
13. Mahendra Prasad
14. David Rubin } Growth breeding
15. Whitaker & (comparative study - males)
16. Burdard H.R. (AP book)
- 17) Wildlife (Protector) Act 1972
- 18) IUCN Red Data book Reptiles.
- 19 Whitaker (1975) MSPT publication
21. Bhatnagar S. (1980) JB NHPs publication
See further survey in the
Anderson and McBurn 1970
Karnataka (Mammals and Birds)

Reptile resources in India - their conservation & utilization for Rural Development

B. C. Chandhury
 Andhra Pradesh Crocodile Conservation Project,
~~Abstract~~ Nehru Zoological Park
 Hyderabad - 500 264, India.

Several species of reptiles are listed in the 'Endangered' list - because of their critically low wild population and continued exploitation for their meat, skin, shell, venom etc. This industry controlled by a few rich businessmen often ignores the conservation aspect. Instead of harvesting rationally, the renewable resource have been mined. To save the existing wild population and to create a healthy industry ^{and} a substitute captive reptile propagation programme ^(RKRPP) has to be developed. Such network of RKRPPs would reduce pressure on the wild stock and ensure the survival of the endangered Indian reptiles. Importance of all this, could help develop a rural based industry in the rural India.

Abstract

Several species of Indian reptiles are in the 'Endangered' list because of the continued exploitation for their meat, skin, shell, venom etc bringing their wild population to critically low numbers. This industry controlled by a few rich businessmen often ignores the conservation aspect. Instead of harvesting rationally, this renewable resource have been mined. To save the existing wild population and to create a healthy industry ^{and} a substitute captive reptile propagation programme ^(RKRPP) has to be developed. Such network of RKRPPs would reduce pressure on the wild stock and ensure the survival of the endangered Indian reptiles. Importance of all this, could help develop a rural based industry in the rural India.

Table xxx Used ~~for~~

Rabbit Species used	Meat	As food	As food	as Medicinal	venom	for skin	for skin	skin	As biological and research specimen	As photo	on head and show bones other use
		As food	As food	as Medicinal	venom	for skin	for skin	skin			

As charms

Snake S

- 1. Snake skin
- 2. Snake venom as food only in East
- 3. Snake meat - Snake charmer, stem business

Discards - as biological specimen and for record - as ²507.

Chameleon -
 Monitor - Skin
 meat -
 Liver -
 fat -
 Monitor of calotes in laboratory - ~~Snake charmer~~ ^{dissection material} stem business

Chelonians
 skin
 meat -
 Eggs -
 medicinal use
 charms - Teeth, Scales etc

Sea turtles -
 Eggs -
 Meat, Blood, Shells

Turtles -
 Tortoise -
 Testudin -
 dit material, research, Pets (Haw)
 Food medicine

1- example of how exploitation has brought Giant tortoise to extinction - Ref. Lanwoon & A - Ban
 captive breeding has been then lack of oversight -
 again Ref -

Reptile resources in India - their conservation
& utilization for Rural Development

memorandum
This refers to your letter of 27th March 1960
on the International Symposium on
"Wildlife Resources in Rural Development"
and the discussion we had on this subject
before earlier.

We came to the conclusion that I
should prepare a paper with the tentative
title "Reptile resources & their
management in rural India".

Abstract
resources

1. Major Indian reptiles & their current status.
2. Their ~~present~~ ^{exploitation} use & records - Part & Poisoned.
3. Potaka &
current ~~present~~ knowledge on Indian biology & ~~and~~ their
application to develop a substitute reptile population
network in rural India.
5. ~~Part~~ ^{Present} concept in reptile production / utilization ~~and~~
for the betterment of rural life linked to reptile
conservation.
6. Discussion

(970)

Reptile resources in India - Their Conservation and Utilization for Rural Development.

B. C. Choudhury

INTRODUCTION

v. confined *no regular*
The relative abundance, a general hatred and a great demand for the durable hides of the reptiles in India, has made them one of the most extensively & widely used wildlife resources. Traditionally, reptiles in India were mostly used for medicine (reptile fat), food (sea-turtle, tortoises) and to a very limited extent - for their skin (monitors, crocodiles and snakes). The post-war period saw a sudden increase in the use of reptilian resources, foremost reasons being:

- a. Good demand for the durable hides in the export market
- b. Being relatively abundant in the wild, it was easier and cheaper for exploiters to harvest reptiles (in most cases they were doing a favour to the people removing the hated reptiles).

This commercial exploitation combined with ^{general} wasteful exploitation of reptiles and lately their habitat destruction, brought several species of Indian reptiles on the verge of extinction. (Mishra (1970), Jani (1970), Sen (1964), Sethadri (1969), Whitcher (1979), Pao (1979) etc.) By 1972 all the three species of Indian Crocodiles, all species of sea-turtles occurring in India, three species of turtles and several species of snakes have already been declared 'endangered' and enlisted in the IUCN Red Data Book and also the schedule list of the ~~1972~~ ^{Indian} wildlife (Protection) Act of 1972.

Hundreds percent of the reptilians used for various purposes were/are being harvested from the wild. Even with protection to present populations may not sustain the present exploitation unless a substitute supply is provided.

Reptile resources in India and their present status -

The diverse climatic conditions and physical feature of tropical India has helped India in possessing a wide variety of ~~reptiles~~ animal life in ~~general~~ ^{and} reptiles in particular. ~~Except Rhynchocephalia~~ all other orders of other reptiles are represented in India. ~~A detail account of reptilian distribution in India can be found in~~ Smith (1931) in his three volumes. ~~of the~~ Testudines, ~~found~~ out of the seven species of sea turtles, occur in India. Terrapins and tortoises are also present in considerable number. ~~order serpentes~~ is represented by ~~over 250 species of~~ snakes ~~are found~~ in India. (Ghering, 1952) Goran (1965) and Chakrabarti (1970), The ~~order~~ ^{order} Crocodylia is represented by three species; ~~the~~ ^{the} ~~order~~ ^{order} Cheloniat. There are over 150 species of lizards representing the order Lacertilia.

The mere number of reptilian species in India is not an indicator of their abundance, as many of them are restricted to particular localities with specific habitats and adaptations - for instance - the Gharial ~~species~~ ^{species} ~~is~~ ^{has} a limited distribution range in the ~~northern~~ Himalayan fold rivers and Mahanadi, The Hyacin ~~tree~~ ^{tree} of Draaco in the western ghats. The

Estuarine crocodiles Crocodylus porosus is restricted
to the coast line. ^{and go on} ~~the~~ ^{life will go on}
increasing ~~of~~ ~~and~~ ~~when~~ we consider ~~the~~
~~British~~ range.

However, of the commonly occurring reptiles
several ~~are~~ species are now in the endangered
list and needs ~~to~~ be reviewed here. The
following ^{important} reptiles are now considered endangered
~~and~~ ~~total~~ ~~legal~~ ~~protection~~ ~~has~~ ~~been~~ ~~given~~ ~~to~~ ~~them~~ -
1972 wildlife

~~in the~~ 1972

1. Gharial -
2. S.W. crocodile
3. Muggler
4. Common Python
5. King cobra
6. Water Monitor lizard
7. Common lizard
8. Star tortoise
- All ~~sea~~ turtles.
9. Lepid olive rollers
10. Hawksbill
11. Green turtle
12. Leatherback
13. Loggerheads

All these reptiles are now in this list because of
survival factor (outlined below) operating individually or
collectively at one time on a particular species. As such it
is important to discuss the pattern of use of reptiles
in India -

Use of reptiles in India: —>

The use of reptiles in India are mostly, ^{used} for these purposes (Table XIX)
~~the following reasons.~~

- 1) as food
- 2) for medicinal purposes
- 3) for skin & hide
- 4) for exhibit purpose (Traditional snake charming)
- 5) ^{as} ~~for~~ laboratory supply (Live & preserved).
- 6) as pets

Though the quantities of reptiles that have been harvested from the wild for the above purposes at any ~~one~~ ^{single} ~~time~~ ^{time} ~~are~~ ^{are} not ascertained ~~to~~ ^{figures} ~~are~~ ^{are} given here. ~~are~~ ^{are} given by Bhanotkar ~~et al~~ (1975) ~~that~~ ^{have} ~~been~~ ^{been} ~~given~~ ^{given} ~~about~~ ^{about} the ~~rate~~ ^{rate} of exploitation (Table XIX)

~~It would give the ^{readers} better idea better to discuss separately the pattern of use of reptiles in India. It is important~~

1. Reptiles as Food.

Snakes — In most part of the country snakes are not eaten, except in a very limited zone and by a few tribesmen. There ~~are~~ ^{is} ~~not~~ ^{is} much of information on this as well. ~~DeKoster~~ (1965) write ~~on~~ ^{on} this

"Snakes more especially pythons are eaten as food in China and Burma. Some people in these areas consider them a delicacy. Many wild tribes in Madhya Pradesh & NEFA areas also eat snakes."

Indian Reptiles and Their Use

Table I

Species Commonly used	As food Meat & Eggs	As medicine Venoms included venoms	For skin & shell	as pets	Laboratory animals	Research Other Substance
<u>Crocodylians</u>						
Gharial	✓	✓	✓	-	✓	
Mugger	✓	✓	✓	-	✓	
S.W. crocodile	✓	✓	✓	-	✓	
<u>Lizards</u>						
W. Monitor lizards	✓	✓	✓	-	-	
Common monitor	✓	✓	✓	-	✓	
Bengal monitor	✓	✓	✓	-	-	
catotes	-	-	-	-	✓	
chameleon	-	-	-	-	✓	
<u>Chelonians</u>						
Sea turtles	✓	✓	✓	-	-	
1 Green	✓	✓	✓	-	-	
2 Ridley	✓	✓	✓	-	-	
3 Loggerhead	✓	✓	✓	-	-	
4 Leather	✓	-	✓	-	-	
5 Hawksbill	✓	-	✓	-	-	
Trionyx	✓	-	-	-	-	
Kachuga	✓	-	-	-	-	
Testudo	-	-	-	✓	✓	
<u>Snakes (Commonly used)</u>						
Kobra	x					
Kraits	x					
RV	✓					
Pythons	x					
R. snake	x					
Boas						

In most of the corollas distributed in
 however, corollas eggs are much easier
 after not only as food but - also for their use
 as medicine; ^{as in the river Mahanadi} ~~in the~~ ^{where other eggs}
 are difficult to get as in Andaman during the
~~corolla~~ egg laying season. There is a great demand
 for the corollas eggs. ^{(Chatterjee (1979) & Pillay (1975))} ~~(Chatterjee & Pillay (1979))~~
^{whitaker (1975) for the Tamil Nadu, (Pillay)}
 many tribes also eat corollas eggs just for
 their food value ~~in the~~ Tamil Nadu. ^{(Whitaker}
 Whitaker (1975) & ~~Whitaker & Chatterjee~~ Chatterjee (1978). ~~Good~~

Chelonia

With ~~the~~ a vast coastline both on the east and
 west coast of India, the ^{fine species} sea-turtles are the mostly used
 reptiles as food. Sea-turtle eggs, and sea-turtle meat
 are ^{also} ~~also~~ ^{along} the east and west coast. Flourishing sea-turtle
 meat ~~business~~ ^{business} were ~~pre~~ operating till 1976 in Kerala, Tamil
 Nadu, Orissa, ^{as well} Bengal coast. A wild turtle ⁱⁿ
 Tamil Nadu and Orissa are famous. (See sea-turtle export
 journal 1976.)
 Tuticorin catches mostly the local users of sea-

turtle meat. In 1975, I carried out a sea-turtle
 marketing survey in Tuticorin and found the following

species used	Price of Meat/kg	Blood / 250 ml	Shell Egg/each
Green Turtle (<i>Chelonia mydas</i>)	Rs 8/- (pure)	Rs 1/-	10-25PS
Hawksbill (<i>Eretmochelys imbricata</i>) (not eaten)	Rs 7/- (mixed variety)		10-25PS
Ridley's (<i>Diplocheilus olivaceus</i>)			
Leatherback (<i>Dermochelys coriacea</i>)			

IWT,
Whitaker (1977) wrote

"Being large conspicuous animals with palatable flesh and commercially valuable skins monitors are heavily hunted in many areas"

while on a ^{S.W.} crocodile egg collection tour to the N. Andamans in 1978 the author has seen several ^{W. Monitor} lizards being killed by ~~people~~ inhabitants ^{very dogs} for ^{meat} and skin. In the Andamans, however, W. monitors still seem to be quite common.

Other lizards in India are not eaten because of the common belief that lizards are poisonous like snakes.

2. Reptiles for medicinal purposes:

Before large scale killing of reptiles for their hide started ~~after the 2nd world war~~ In India, Traditionally reptiles were ~~used~~ killed mostly with the purpose of using them as medicines. Though, the effectiveness of this use is still a ^{questionable} ~~subject~~ ~~of~~ the belief and exploitation still continues.

Snakes.

All over India snakefat is used as medicine particularly as a cure for rheumatism etc. It is not a very uncommon ~~thing~~ to see snakefat being sold by the snake charmers and tribals. Jeoras (1965) wrote in this

Thus "the use of snake oil has been formalized from ancient times and was quite widespread... Among the many uses of the oil are "to absorb tumours or swellings" "for relief of frozen

limbs," "for bruises, aches and sprains"

He also writes about the ~~shedding~~^{use} of milked skin of snakes for medicinal purposes. ~~These~~ on the other hand one use of snake for medicinal purposes is based on strict scientific ground and that is the use of snake venom to produce anti-venin. Snakes are 'milked' of their venom to be used in preparation of anti-venin. In India only two established institutes - Hartthine Institute Bombay and Central Research Institute Kharauli use snake venom for this purpose. Since the 'venom milking' operation is a technical and risky business and needs laboratory facilities such operations are restricted to research laboratories only. However in states like Karnataka are sent to their labs. from all over India. The present rate of venomous snakes ranges from Rs 15 - 30 each depending on the species and size.

~~Snake venom is also used for~~ ~~for~~ ~~the~~ ~~requirement~~ ~~of~~ ~~the~~ ~~state~~ ~~of~~ ~~Karnataka~~ ~~that~~ ~~during~~ ~~the~~ ~~year~~ ~~1965~~ ~~the~~ ~~requirement~~ ~~of~~ ~~snake~~ ~~venom~~ ~~is~~ ~~estimated~~ ~~as~~ ~~465~~ ~~gms~~ ~~/year~~ ~~(~~ ~~cost~~ ~~of~~ ~~present~~ ~~method~~ ~~)~~ ~~which~~ ~~will~~ ~~require~~ ~~several~~ ~~thousand~~ ~~snakes~~. The cost of cobra venom was Rs 120/gm and Rs 250/gm for Krait venom in 1965. (K. H. Kharauli)

Branchitis etc. ; Chandh & Barbo (1975)

Chelonians:

Not many chelonians are used for ~~them~~ with medicinal beliefs. However, deriving the cause of market survey of sea turtles in Tamil Nadu in the year 1975 the author has seen from green turtle bloody being sold at the rate of ~~one~~ one rupee for pound. on enquiry it was known that the blood is taken as a medicine for curing 'Asthma' and as a general Elixir.

Lizards: All monitors are killed to procure feet and several organs with the same medicinal belief as that of the crocodilians.

3 Reptiles for skin & hide

~~Section on reptiles for skins~~
Almost anyone who has written about the present status of Indian reptiles have pointed out that the major cause of decline of reptiles in India is ~~the~~ demand for their skins.

Skins of crocodiles, lizards and snakes are most in demand and ~~manufacturing~~ ^{are still being} exploited (Snakes). Export data ~~of reptile skins~~ presented by Bhattachar, Bhattacharya and Thakur (1975) ~~includes~~ gives an idea of how ~~the~~ much of reptiles are being used. (Table XXX)

Snakes

Pythons, ratsnakes followed by Cobras, ~~snakes~~ ^{and} boas compose the bulk of exploitation for ^{snake} skin. Whitaker (1978) writes

"The snake-skin industry means employment for tribals, but - as there is no control on numbers and season and since the middlemen get the major profit at the end, it is both ecologically and economically unsound".

After the ban on export of ^{snake} ~~reptile~~ skins vide Export Trade Notice No 201/75 dated 22.12.75, it was believed that there will be stamp in the ^{exploitation} ~~export~~ of snakes, however it is now seen that ~~snake~~ luxury goods made of snake skin are being sold in Indian market at prices ranging from Rs 100 - 300 per ~~bag~~ ^{bag} of a normal size handbag.

Crocodilians

Of all exportable reptile skins from India a considerable lot ^{is} ~~most~~ ~~comes~~ from the three species of Indian Crocodiles and as it has been pointed out earlier this is one factor that has contributed ~~to~~ to the decline of the Indian Crocodilians in general and Gharial and estuarine crocodile in particular. The African crocodile skin is considered to be the best

The price of Hawksbill shell ranged from Rs 10/2 to Rs 150, where as other sea turtle shells were sold at a range of Rs 30/kg. #

Lizards

All lizards of the genus Varenius are exploited for their skin - especially the water monitor lizard V. salvator and the common lizard V. bengalensis. ^{Tanned & untreated} Lizard skins form a considerable quantity of the reptile skins that were exports between 1967 - 1973 (Sharma & Thapar (1975)). (See table XXX).

4. Reptiles as exhibits

Snakes India has been the land of 'Snakes and Snakecharmers' in the minds most foreigners. This is because, in every region of the country ^{professionally} ~~traditionally~~ 'snakecharmers' exhibit their snake collections ~~to~~ to ever interested public. This profession is handed down to generations. The most common use of snake is ~~of~~ - mainly because of its religious significance and the expanded hood that attract attention. There is also a certain amount of bravery or adventurous involved in this. Other than Cobra, Python (because of its

large size) Sandboars (with the common belief that these are two headed snakes) and Green whip snakes and Rat snakes are exhibited. King cobra also from the past.

~~Next to exploited~~
In eastern part of the country - particularly in Orissa & West Bengal Kingcobras are also exhibited by these professional snake charmers. Almost every state has its own community of professional snake charmers & catchers.

Other reptiles like Chelonians, Crocodilians & lizards are mostly exhibited in zoos and other such institutions. ~~but this has also not to some extent.~~ Indian zoos have not shown much interest in exhibiting reptiles - perhaps because reptiles were such a common sight - in India.

5. Reptiles as laboratory animals

Till recently Varanus bengalensis and Bramasrix were the two reptiles that were being used very extensively as model reptiles for purposes of zoological studies and as such large number of these two species have been killed. ~~the~~ Of late, however, the stem has fallen on the Common garden lizard Calotes variegatus due to unavailability of varanus sp. and Bramasrix. Most of these reptiles

are done by the rural masses.

~~Another lizard which is used~~

6. Reptiles and pets

Snakes

Barring the snakecharmers, very few people keep ~~reptiles~~ snakes as pets. However, Pythons, Boas are the main ~~reptiles~~ snakes that are kept as

Pets

Crocodylians

Crocodylians are not kept as pets, but are kept in village tanks and religious places because of the religious feelings towards them (Mukherjee (1975), IAS (1978)). Traditionally, ~~in India~~ used to keep crocodilian as pet.

Chelonians

only the Indian starry tortoise Testudo elegans is kept as pet but this also is very rare, ~~but~~

Lizards

The unique Indian chameleon, Chamaeleo zeylanicus is the only lizard that is fancied as a pet because of its ability to change color patterns of its body. Chamaeleo
~~many reptiles are kept as pets in India,~~
However, of late with the increasing awareness about the reptilian importance more and more reptiles are being kept as pets.

Proposal for Reptile production & Utilization for Rural Development.

We have seen so far that reptiles are used rather extensively in India and all reptiles are harvested from the wild. ~~Several~~ Despite of legislation the demand ^{for reptiles} ~~and~~ ^{their} exploitation ~~will~~ ^{continue} ^{in future} to provide an alternative to this ^{serious stress} ~~draw~~ on wild population. ^{Rural} Captive Reptile Propagation Programmes ^(RCRPP) are proposed. This argument is based on the following grounds

1. Sufficient technical knowledge to carry out rural captive reptile propagation programmes are available at present.

2. Since ^{direct} exploitation of reptiles in India is carried out by the rural mass with no direct benefit to them, such rural based programmes with sound scientific background would provide direct benefit to the rural mass and at the same time help conserve the

resources of breeding & rearing ^{of} several species of reptiles in India - ^{and elsewhere} ~~justicably~~ ^{justicably} the captive rearing of crocodiles in India, FAO (1975) which has brought back the endangered Indian crocodiles back from the brink of extinction ~~also~~ encourages to think in these lines.

3. ~~Primarily~~ Initially such efforts ^{would} ~~should~~ embrace those species of Indian reptiles that have a promise of success and which are ~~not~~ ^{not} mostly commercialised.

5. Such ~~after proposed~~ RCRPPS' would be more profitable and present fewer problems than the wild harvesting of reptiles.

For This will involve only the rural ~~habitat~~ ^{and} ~~whose~~ traditional reptile harvesters of India.

Since such programmes would be in limited areas and circumstances greater management and control can be exerted.

Analysing each of these considerations:

1. Success of breeding ^{Rearing} Indian reptiles.

The present record of ^{captive} breeding of Indian reptiles is confined to mostly 2000 and such other

institutions ^{have been set up and in India} success in breeding the Indian crocodiles ^{have been successful in} ^{India, 2003, Hyderabad.} ^{Prabhakar ()}
^{Jaipur, Ahmedabad, Barode, Dilli, Madurai, Mysur, Prabhakar ()}
^{Jarvis ()} ^{Whitaker ()} and ^{S. W. Crocodile}

in Thailand Yangprocharak () and the Shervel

in Wendenhamm Zoo, ^{Germany}. Except for the Shervel neither much elaborate attempt has been made nor was necessary to breed these reptiles in captivity.

Similarly, Pythons have been bred in captivity, Acharya () ~~Tortoise~~ ^{in Mauritius} ^{by David}

() and Tortoises have also been bred in captivity.

Hatching sea-turtle eggs in captivity in

India is also a phenomena of the house Acharya (1973)

Whitaker ()

3. Technical knowledge in this field:

Though there is a real shortage of field experienced workers in this field, the available literature on the technical aspects of reptile rearing, and educated persons who with training might form the main ~~background~~ force of operating such RCRPPs may not be ruled out. However, this needs better consideration since the success or failure of RCRPPs would entirely depend on the technical capabilities of persons operating ^{performing} them.

The technical knowledge to maintain a RCRPP will involve a basic knowledge of the Biology of Reptiles, such persons, fortunately can be trained from the vast majority of

4. At least commercially valuable species like the crocodiles, pythons and monitor lizards whose breeding biology is sufficiently known can be attempted. Honeyeats () detail account of captive breeding reptiles and Burdick () work for breeding crocodiles are very helpful. Unlike, the European countries, India needs very little effort to breed the autochthonic reptiles in captivity.

Economic prospects of farming crocodiles at a village farming level has already been prepared by FAO. De Ward (1974) and this report was up dated by taking in to account only one species of crocodile ~~major~~ C. palustris later by FAO De Ward 1978. ~~The~~ At least an economic model exists for one species of Indian reptiles.

5. Since the proposed RERPS would concentrate on those species that are suitable for captive propagation with an economically viable proposition, and based on sound management-principles and plans, it is but natural that these would prove profitable. In contrast to this the present - wild harvesting (leaving aside the planned free-range farming) with uncertain population,

and unplanned, and diminishing resources
is in the long run unprofitable. ~~Added to this~~

There will be fewer problems in a cage
centre on harvesting since every ^{to be} harvested
animal is marked and is already a target. In
short quite a lot of uncertain and unknown
problems that usually crop up in harvesting wildfowl
(thereby increasing cost) is ruled out.

6. With limited number of stews on a
set suitable area, and backed with sound
management-principle will mean better management
and control which usually is ~~not~~ either not quite
possible (where possible needs more manpower
and ~~modification~~ money) in the wild.

7. Since the proposal of RERP is entirely
based on a rural background it should be
taken for granted that this will involve the
traditional raptor handlers (mostly rural people)
and the benefits gained goes to them just as
the middle man which is the usual practice with
wild harvesting.

Basic guideline for a RCRPP.

A Rural captive reptile propagation programme may ~~start~~ be started with the following guidelines.

1. The RCRPP centres should be established only in the natural distribution range of the species to be propagated in the centre other than being climatically suitable such areas will ensure on the natural diet of the species more vital for quick growth of the stock - most essential in ~~the~~ commercially oriented organisation.

2. Other considerations will include the total utility of the stock as a finished product. An example if a RCRPP centre is propagating pythons in an area where only the skin is used and the meat is wanted - the whole purpose is defeated whereas if a Python propagating centre is established in a region where python meat is relished (eastern India) then, both skin and meat will fetch money and will serve the purpose. This will however need a detail survey of utility of reptiles in various parts of the country.