

# Veröffentlichungen ARCO

2014

-ARCO Newsletter no.09-

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## Progress in the development of our Turtle Rescue & Conservation Centre

### What happened during last months.....

Antiescape tubes had been set up around the existing ponds using PE-tubes and



aquatic vegetation and wild growing native plants converted the artificially constructed ponds into natural independent habitats



Our triangular earthen pond had been equipped with underwater separation units (left) to receive bigger and more aggressive softshell turtles. And the TRCC dammed main lake has soon changed into a wonderful natural habitat to receive a variety of turtle species.



Early this summer the SUMMEF Recreation & Nature Park celebrated its inauguration to public and last month a police station had been installed to safeguard the park and surroundings.  
(photos: N.Bhattarai/ARCO)



**and what's going on right now .....**



In October took place the laying of the foundation stone for our TRCC - Building accompanied by a traditional Hindu ceremony after right day and time had been chosen carefully.



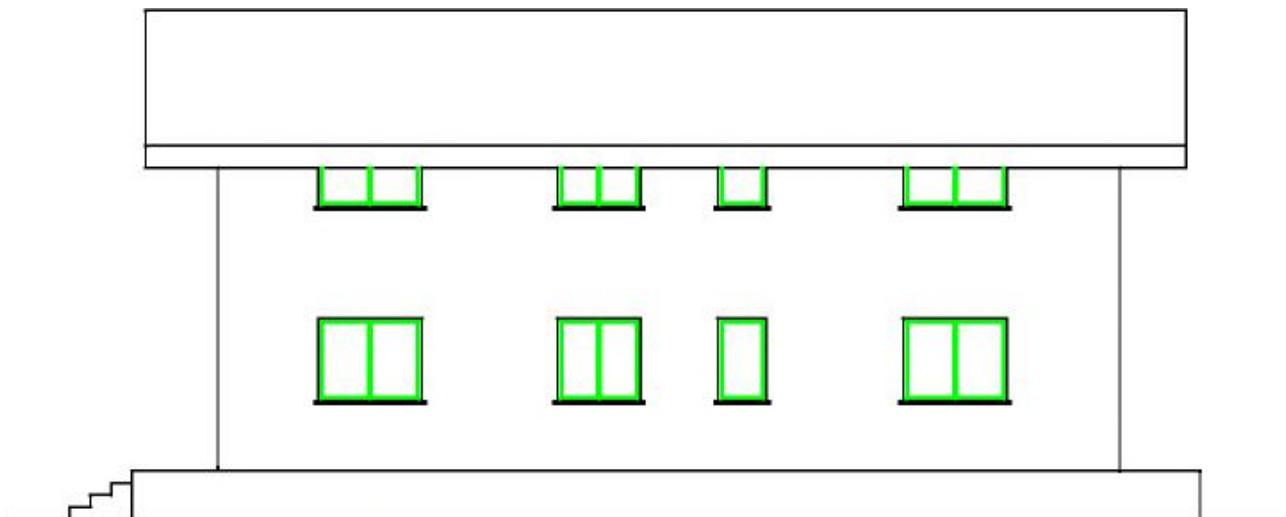
Basic works for the foundation and a view of the plan for finalization of the construction



**Drawn plans of the TRCC Central Building being under construction**



Front view



Rear view

Drawings kindly acknowledged by ARCO-Nepal: Diego Tovar, Roquetas de Mar/Almeria, Spain



## Basement

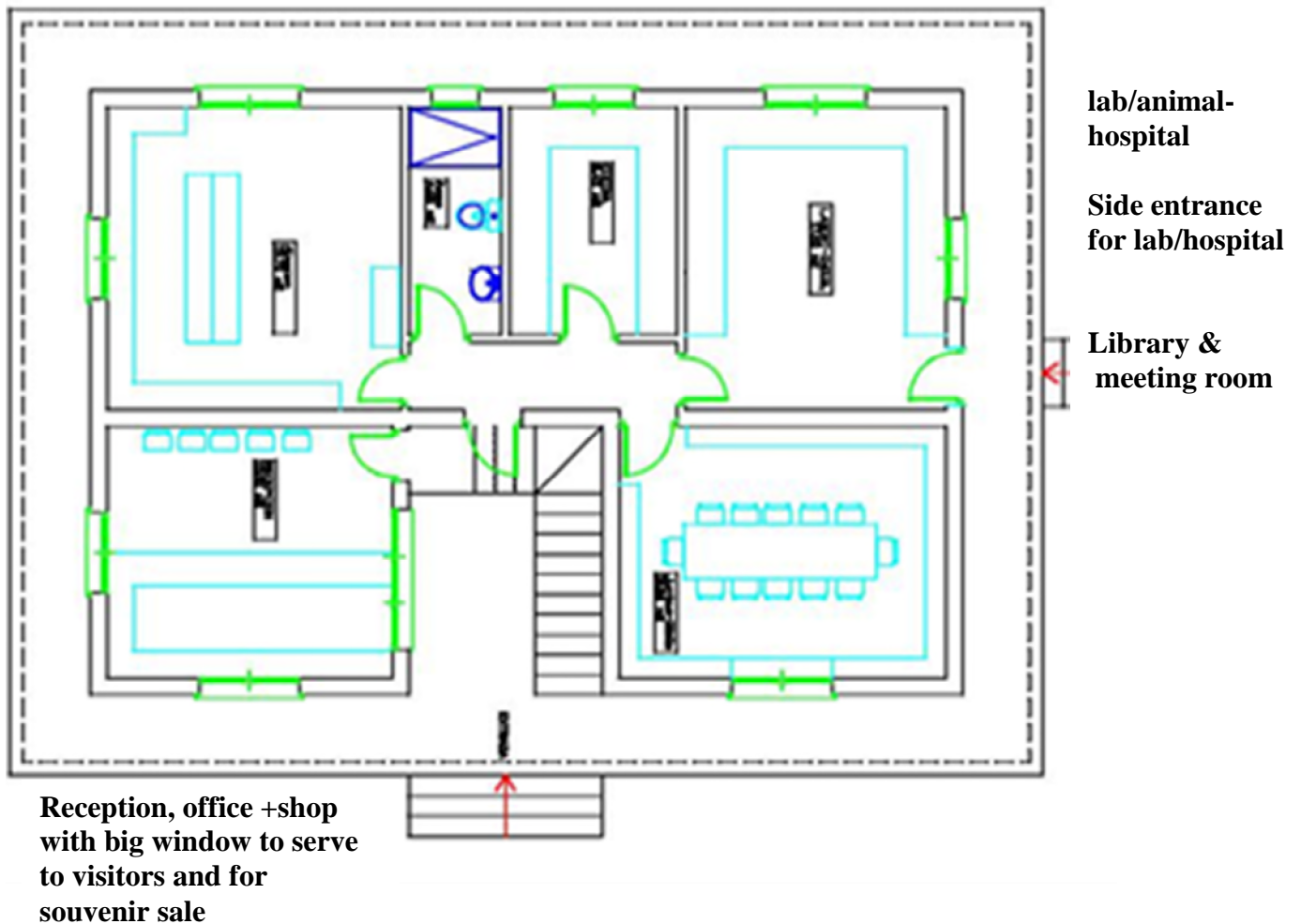
- Basement on an elevated platform of boulders or on a underground set up on beams and air chambers to avoid capillary humidity entering the house
- Dimensions are the same as those for which we have already received cost estimations
- and have been accepted as we requested months ago at the start of the construction

**Working & rest room**

**Bathroom**

**kitchen**

**laboratory**



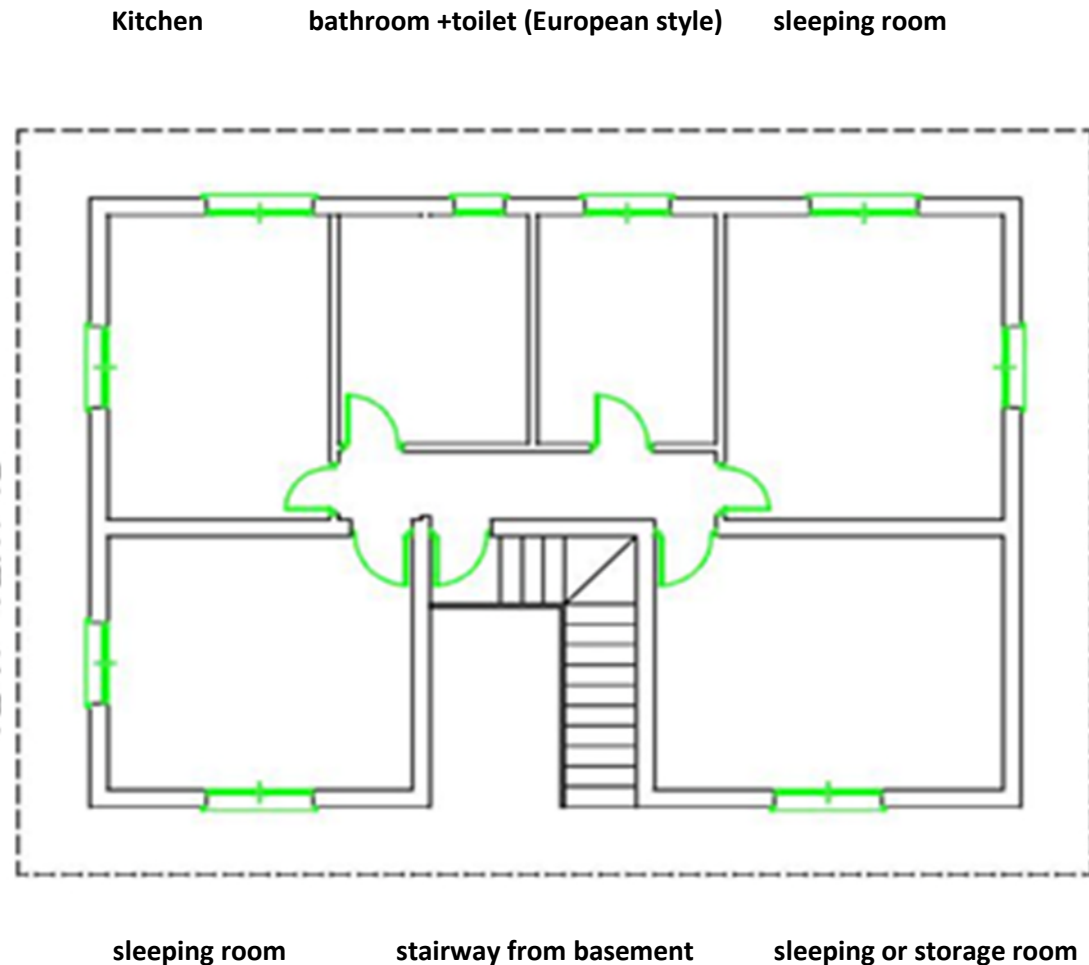
**Principal entrance with stairs leading to 1<sup>st</sup> floor**

The basement construction has to serve for all the logistics necessary to run the TRCC at BudoHoli/Sanichare SUMMEF Recreation & Nature Park.

The building shall be constructed on an elevated platform to avoid capillary humidity during the monsoon rains to enter the house. A wide entrance situation also shall allow visitors to approach, give some shelter and access to reception+ office + sale room. There is also a meeting room and library as one common unit, a toilet, small kitchen, laboratory +hospital and one restroom.

## First floor

- Having same dimensions as basement and also the basement walls are carrying the 1<sup>st</sup> floor walls.
- The middle part is highest due to the inclined roof, the outer peripheral area is just on a height of approx. 150 cm, places high enough for beds, shelves etc.



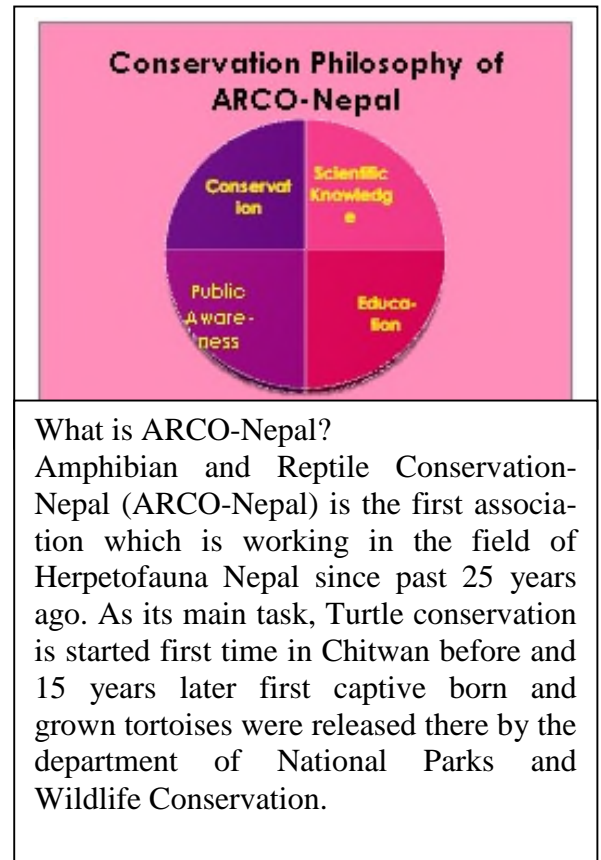
The first floor shall have an independent stairway for guests, to avoid entering through the basement.

There is a small kitchen, a bathroom (shower + sink, lavatory) and an European styled toilet.

Two sleeping and one storage room shall offer possibilities for VIP guests, Researchers, Advisory Board Members to stay at TRCC when the need arises.

## First awareness and sensitivity seminar on Turtle Conservation at Budo Holi –TRCC .....“Drop-Drop can make an Ocean”

CONSERVATION' although challenging is not such an easy task although this word sounds nice and promising. This term becomes even more difficult when trying to apply it for protected flora and fauna within limited and endangered populations. Awareness and sensitivity is one of the first and most important steps for serious conservation efforts – a principal philosophy in the four columns of ARCO's policy: Create basic scientific knowledge, contribute to education, try to save endangered species by conservation issues and create awareness about the important needs to save species and natural heritage. All important steps to make aware local people as local communities can always be principal conservationists. We conducted a first sensitization programme on 30<sup>th</sup> August, 2014 at our new and developing Turtle Rescue and Conservation Centre (TRCC), Budo Holi, Sanichari municipality, Jhapa. The major objectives of this formal programme was to introduce the turtle and the important progress of construction at TRCC and future plan of SUMMEF-ARCO for turtle conservation.



The programme was chaired by chief of SUMMEF local management committee (SLMC) Mr. Birkha Pradhan, special guest Prof. Dr. KR Khambu, guest Mr. Arjun Rai and Hari Dahal and other invitees are Nabin Bhattarai, TRCC representative and Kamal Sangraula. More than 100 people participated in the programme who are residents of surrounding of TRCC area.

Hari Dahal, member of SLMC has started the programme with his welcome speech. Arjun Rai, vice-president of SUMMEF gave his speech on how ARCO-Nepal and SUMMEF jointly run this TRCC project. Prof. Rai focused on turtle species in Nepal, scientific value, necessity of conservation, status of turtle in Nepal and the expectation of TRCC to local communities. TRCC representative explained the infrastructure made at TRCC as well pipeline construction work for turtle rescue and sustainable conservation of turtle in SE Nepal. Interactive session was the core part of the programme where participants raised their query and shared their experience. We, Nabin Bhattarai and Prof. Rai, responded to their query. Also, at this session, we collected comments and compliments about the TRCC and turtle conservation. Representative voices are presented below translated into English.





Written votes from the auditory (translated into English):

"I am Dambar Puri, resident of Sanjarjun-7. I am ready to help and support if TRCC needs. I want to congratulate to dedicated committee."

— धम्बर पुरी —  
संजार्जुन-७ जहापा  
मुद्दा : — पाल्पा जाने पर्छे । गर्दोले हाम्रो पाल्पा  
हुन्छ । पाल्पा जाने गर्दा सल्लाही छ  
सार्थ संरक्षण गर्ने प्रयत्नमा जानु पर्छ ।  
२०७४

Kiran Bantawa Rai, Sanjarjun-9, Jhapa: "Turtle conservation is good. This conservation can add the value of this beautiful places. In my view, a proper place for conservation of turtle is nearby big lake than existing TRCC area. My support goes to turtle conservation. This type of awareness programme is necessary in future too."

Dambar Biswas Tharu, Sanjarjun, Salbari, Jhapa: "Thank you to K.R. Khambu. I will hand-over one turtle if I can. Awareness programme is very important to conserve the turtle."

डिम्बी दास भास्कर  
संजार्जुन-९ जहापा  
मुद्दा : जसुकै पाल्पा जाने पर्छे त्यसो कुरा हो ।  
भर्खै गर्दा यस क्षेत्रको बेलाभो ठेको छ ।  
असलमा हाम्रो संरक्षण गर्नुपर्छ ।

Bharat Chaudhary, Sanjarjun-9, Jhapa: "Suggestion: Turtle conservation activities always and my dedication always goes to conservation of turtle"

Himlal Sitaula: "I will stand against the illegal trading and poaching. I will support this conservation activities as I can"

हाम्रो जहाँसो कसैले गर्दा  
जस्तो गर्दा हुन्छ ।  
मैले जसुकै जाने गर्दा  
सल्लाही छ । जाने हाम्रो  
यो सल्लाही छ । जाने हाम्रो  
हाम्रो जहाँसो कसैले गर्दा  
हाम्रो जहाँसो कसैले गर्दा

Dilliram Bharati, Sanjarjun-9, Jhapa: "Suggestion: Turtle conservation is good. This park increases the economic activities as well natural beauties. We have to join hands."

हाम्रो जहाँसो कसैले गर्दा  
जस्तो गर्दा हुन्छ ।  
मैले जसुकै जाने गर्दा  
सल्लाही छ । जाने हाम्रो  
यो सल्लाही छ । जाने हाम्रो  
हाम्रो जहाँसो कसैले गर्दा  
हाम्रो जहाँसो कसैले गर्दा

हाम्रो जहाँसो कसैले गर्दा  
जस्तो गर्दा हुन्छ ।  
मैले जसुकै जाने गर्दा  
सल्लाही छ । जाने हाम्रो  
यो सल्लाही छ । जाने हाम्रो  
हाम्रो जहाँसो कसैले गर्दा  
हाम्रो जहाँसो कसैले गर्दा



Mr. Pradhan closed the session with word of thanks to participants, guests, chief guest and other who helped the turtle conservation in Budoholi and this programme.

By: K.R. Rai & N. Bhattarai, ARCO-Nepal reg. soc.



## Turtle identification and species approval - ? how reliable is information from locals

Not only completely wrong so-called scientific literature or publications lead to a big amount of misinterpretations of the local native herpetofauna (own experiences during former lecture programs) of Nepal but also information that was only tentative or to believe what local people may tell one – without having ever seen the species or it being documented by at least proper voucher photographs or museum specimen. See in lit.: “Amphibians and Reptiles of Nepal” by Schleich & Kästle, 2002:68ff

“Even among zoologists and conservationists a lot of confusion existed concerning records and the existence of various turtle species in Nepal. One example is a “university teaching book“ on zoology entitled “Wildlife of Nepal” and used over many years, which contained a mere compilation of data from neighbouring India. Even species restricted to America or Europe such as “*Hyla arborea*, *Hyla versicolor*, *H. arenicolor*, *H. crucifer*, *Rhacophorus rhacophorus* (sic), *Bufo bufo*, *B. viridis*, *Rana temporaria*, *Rana pipens*, *Rana esculenta*, *Eumeces fasciatus* (sic), *Uromastix* spp., *Python reticulatus*“ were enigmatically mentioned among many others (SHRESTHA, T. K., 1981) as occurring in Nepal. Still worse was the fact that school and university courses were supplied with herpetological material imported from India and even America. Thus, it is no wonder that 15 years ago there was still a strong belief among Nepalese zoologists that *Uromastix* or *Chamaeleo* must occur in Nepal as these taxa were used for teaching purposes throughout the country (see also following article by K.R. Rai, this newsletter!!).

My own experiences during many years field work and also just recently from last spring, shall give some more examples.

Turtles are commonly kept in wells in Nepal as people believe that they prevent them from drying out. Such a well we were happily allowed to inspect, supported by its local proprietor in March 2014.

This well was about 6 m deep and big enough for a slim person to crawl down to water level within it. But before taking out the specimens, we showed the owner of the local property all nepali species on proper photographs – and received, –for them the convincing- information based on those photos, that they were keeping 2 big sized roofed turtles (*Pangshura* sp.) in their well. It sounded surprising and astonishing and what came out at the end were two Indian flapshell turtles (*Lissemys*).



Finally this owner gratefully promised us that he will handover those two adult *Lissemys* to our new TRCC when it is inaugurated.

This particular day and event was a great experience for all of us! And we like to thank those kind persons for the great hospitality.



Similar information we received when searching for turtles keeping in mind that the common name is “Kachuga” in Nepali and formerly also was in use as a generic name for several species. Thus, also receiving the first verbal information more than 25 years ago, of Kachugas (*Batagur* sp.) living in the rivers of South Central Nepal and at Chitwan National Park. So far, we do not see evidence for proven records of these big growing highly endangered terrapins and in the publication of CARON exactly these particular species are shown with a wide distribution in Nepal but only by using photographs authored by I. DAS, a serious scientist colleague dedicated to herpetology from S-Asia for his whole life. Similarly, first records of the Indian eyed or ocellated turtle *Morenia petersi* which after years turned out to be that its shell had been received from a petrol station on the way to India’s border and was never recorded in the close by mentioned lake.

Another misleading publication is a book “Herpetology of Nepal: A study of amphibians and reptiles of Trans-Himalayan Region of Nepal, India, Pakistan and Bhutan” by T.K. Shrestha (2004). We reprint (in part) the book review on Amazon by Smoochy:

“I’ll come right out and say it - the captions for the pictures in this book are the greatest I’ve ever seen. Get this book just for them. The language barrier allows for great one liners such as “Rock agma basking on the sun”, “Wild and Acenic Arun River Chutes Down in to deep gorge near Golga village with terrific roar and the thunder.”, “Ready for sucking spermatophores”, “Snake man wearing cobra blowing his flute semi-terrestrial”, and my favorite “Its tail is brown with black mark, which made the snake quite dreadful.” .....

.....As far as formatting, this book is difficult to use. There are no page headings Names are a bit strange, and strange murals and diagrams are found in the text. Pictures change from color to black and white halfway through the plates, and follow a completely different format like two books were stuck together. Species accounts are punctuated by sidebars like “Ranching Crocodiles in Himalayan Waters” and sections on how to build a turtle breeding pond. (By the way, you’ll notice that the turtle park and crocodile park diagram are the same, with different cartoon animals drawn in over top)”.

Focusing still on the turtles again,

FRAZIER (1992) confirmed that there were neither *Agrionemys horsfieldii* nor *Geochelone elegans* originally occurring in Nepal. Thus, as a result of my own experience in dealing with Nepal’s local herpetofauna, especially the turtles, I agree and fully support the statements by FRAZIER & DAS (1994):



“The present day distribution records of turtles in the Indian region must be interpreted with caution.

- Firstly, many locality records - reported here or elsewhere - are based on specimens (or parts of specimens) that were not examined in situ, but found in middens or brought in by villagers.
- Secondly, visual descriptions - especially when they are not supported by photographic evidence at least - are contestable but not resolvable. **These two classes of records, particularly the second, serve mainly as indicators of places for further investigation - and not as confirmed records.**
- Thirdly, the degree of habitat perturbation in India and the region (deforestation, industrial development, pollution of soil and rivers, hydroprojects, etc.) has tremendously altered vast areas of “original” habitat during the last few decades. As a result, some species (both terrestrial and aquatic) are certain or have been completely exterminated, or so reduced in numbers that they cannot now be found where they formerly occurred.”

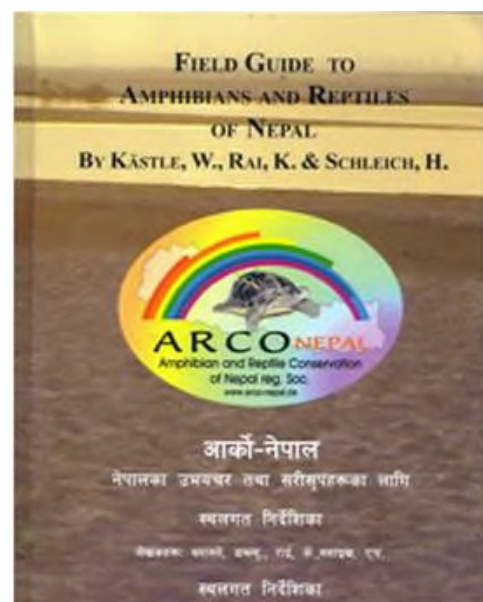
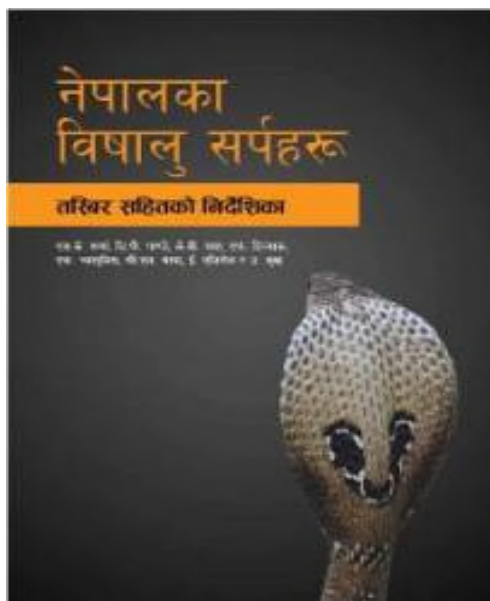
Final note: In July this year we received the photograph (to the right) from a Nepali biologist with tentative identification of *Hardella thurjii* what in reality is the **globally invasory North-american species *Trachemys*** sold in petshops and when outgrown often released into wild and **being harmful to local fauna!**

Schleich, H. Hermann, Arco-Nepal



Found recently in Belbari, SE- Nepal

Free electronic copies of the book on “Venomous snakes of Nepal” (4.1 MB) are available for download: [http://www.bik-f.de/root/index.php?page\\_id=77&projectID=55](http://www.bik-f.de/root/index.php?page_id=77&projectID=55)



The ARCO-NEPAL Field Guide (2013) about reptiles and amphibians in Nepal - with identification keys and distribution maps, Size A 5, 625 pages, 52 pl./156 color photographs, 177 maps, over 1000 black/white illustrations, Nepali & English Published by ARCO-Nepal reg.soc.

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## **Anthropogenic impacts on the herpetofauna with special reference to the science education in Nepal**

By  
Kalu Ram Rai

### **Abstract**

Conservation and development are co-conflicting terms of the modern age. From the environmental point of view, the anthropogenic activities are often considered a leading factor for the depletion of wildlife. In the name of development and practical work in the educational institutes, the loss of a large number of frogs, lizards and other animals for dissecting, went either unnoticed or ignored. Previously the required specimens were imported into Nepal from India. This caused no effect on the local species. When India banned export of specimens into Nepal (1999) for biological utility, local collection increased leading to a dwindling population of commonly found species. Nepal has felt an immediate need for conservation. Unavailability of specimen in many Government and private educational institutes created an alarming situation. Concerning the environmental aspects, there is an urgent need to control the injudiciously commercial collection of the specimens from their natural habitats. Keeping this view in mind, an attempt has been made in this paper to analyze the problem and to draw the attention of conservationists towards wildlife farming and breeding for scientific research, to fulfill the crucial educational necessities in the country.

**Keywords:** Anthropogenic impacts, herpetofauna, dissecting material, educational institutes, wildlife farming, Nepal.

### **Introduction**

Geographically, Nepal lies in the subtropical region but it has diversified climatic belts. It has rich biodiversity which includes 177 species of herpetofauna (SCHLEICH & KAESTLE, 2002, KÄSTLE, RAI & SCHLEICH, 2013). Throughout the history of civilization, human activities have been harmful to the natural biota (DUELLMAN & TRUEB, 1986). Since the 1960s the physical condition and productivity of forest resources have been gradually deteriorating due to the excessive pressure of over population, overgrazing, and other natural and manmade calamities (BAJRACHARYA, K.M., 1999). Therefore, only a few remnants of natural forests have survived where most of the rare wildlife was found and many species have now become endangered. For example the declining frog populations have caused a heavy economic strain, not only due to the tremendous rise in purchase of insecticides but also due to the damage to the ecosystem (SHRESTHA, 1990). Rapid urbanization and industrialization occurs with wide scale deforestations and also is radically changing the indigenous traditions, whereas science and technological education is bringing an inevitable progress in everybody's life. In Nepal, most of the scientific research activities are carried out in government laboratories, different institutions under the universities and Nepal Academy of Science and Technology. While the history of education in sciences goes back to almost 80 years, the history of scientific research in teaching institutions of our country is relatively recent (BAJRACHARYA, D., 1999). Introduction of dissertations at post graduate levels in early 1970s contributed significantly to the promotion of research activities in the teaching departments of T.U. (ibid). But now, with the expansion of universities, research centers, medical institutes and private teaching institutes, where a large number of dissecting animals (mainly earthworms, cockroaches, molluscs, fishes, frogs, lizards, birds, rats etc.) are here still needed for morphological and physiological tests and experiments. Recently, the education system of Nepal has introduced +2 programme at Higher Secondary level, where the biological education is offered as a pre-university syllabus. This being developed as a multi-university concept (fig. 1) during the last decade. Besides Tribhuvan University (TU) there is Kathmandu University (KU), Purvanchal University, Pokhara University and affiliated medical colleges established. These universities have introduced several biological research courses in their curriculae from the levels of intermediate to Bachelor and Master (tab. 2), where, the locally available perianthropoc species of amphibians and reptiles are chosen for dissections. Such unexpected high demand is causing and creating problems not only at procurement level for the research institutes but is decimating the species and seriously affecting nature conservation.



## Methodology

Data were collected from different campuses like T.U., K.U., Higher Secondary Schools and medical institutes including private technical institutes (fig. 1). The sampling of the dissecting specimens was done directly by surveying the Zoology Department of various campuses like Mechi, Morang, P.G., Biratnagar, Dharan, Rajbiraj and Siraha (fig. 2) with the identification of used species. From others such as Janakpur, T.R.M., Birganj, Bharatpur, Butwal, Nepalgunj and Siddhanath, Mahendra Nagar from Terai Region, and Palpa, Pokhara, as well as Science Campuses from Kathmandu Valley and Dhankuta from the Mountain Region of Nepal, the data were estimated with reference to the student quota. In addition, records were collected from K.U. Campus and science streams of Higher Secondary Schools from East, mid and West Regions. While discussing with the authorities of those relevant campuses regarding the availability of dissecting specimens, it was learnt that previously it had not been a problem since all specimens were imported from India. But presently, due to erratic supply of the specimens by local dealers, they were facing complaints from the students. They were unable to provide optimum number of specimens in practical classes to the students.

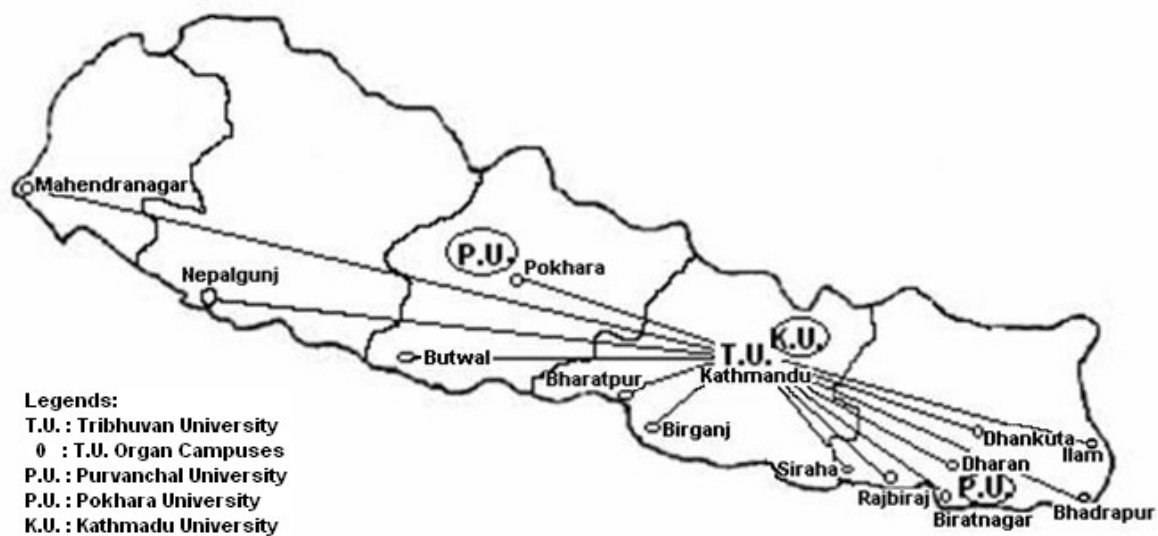


Fig. 1: Science Campuses of T.U., K.U., P.U. and Purvanchal University in Nepal

Institutes/Universities/HSS-HMG	Levels			Total students
	Intermediate	Bachelor	Master	
T.U., Sc. & Tech. T.U. (1997)	7,366	3,378	1,283	12,047
T.U., Science and Technology (2001)	6,539	4,921	1,159	12,619
Eastern Development Region "	1,236	669	70	1,972
Middle Development Region "	3,726	3,247	1,029	8,002
Western Development Region "	1,095	607	46	1,748
Midwestern Development Region "	183	121	-	304
Far Western Development Region "	302	277	14	593
K.U., Science Faculty (1997)	378	192	14	581
K.U., School of Science (2001)	439	245	14	698
HMG, Higher Secondary Ed. (10+2) (2001)	24,368			24,368

Table 1: Survey on Enrolment of Students at T.U., K.U. and HSS in 1997 and 2001  
Source: T.U. Special Bulletin (2002) & Four Monthly Statistical Bulletin, CBS-HMG 74:2002

## Data Collection

The data of the enrolment of the students in the higher secondary levels and Universities in the academic year of 2001 was found to be 37,685 (tab. 1). During the random survey of the stored specimens at the biology laboratories of East Terai Campuses (e.g., Mechi, Biratnagar, Dharan, Rajbiraj and Siraha), especially four frogs species were being used and identified as *Hoplobatrachus tigerinus*, *Hoplobatrachus crassus*, *Limnonectes* sp., and *Euphlyctis cyanophlyctis* (tab. 3). Although protected by CITES, *Hoplobatrachus tigerinus* was found to be collected (40.2%) in laboratories without any conservation knowledge. As random samplings

were done on the campuses of East Nepal, the stored specimens found were *Hoplobatrachu tigerinus* 40.2 %, *Limnonectes teraiensis* 39.0 %, *Euphlyctis cyanophlyctis* 15.6 %, and *Hoplobatrachus crassus* 5.2 %, respectively (tab. 3). In this way, in Higher Secondary Levels, *H. tigerinus* 9.0 %, *H. crassus* 4.8 %, *E. cyanophlyctis* 42.7 %, and *Limnonectes spec.* 43.5 %: were also recorded, too (tab. 4).

In the capital city Kathmandu, a survey on the suppliers of dissecting material was done for some government and private campuses. First to be contacted was the proprietor of Suman enterprises (R. BAJRACHARYA), where data on preserved frogs were collected. Another was EUREKA enterprises (Science house) who supplies 10 thousands frogs (sic!!) per year (GORKHAPATRA, 2003). According to Mr. Gautam (Eurica Enterprises), suppliers have to pay 36% tax to the custom office, even though there is no provision of direct entry in its original name. It is allowed by substitution of dead organisms such as murex, clams etc. According to the official record of Custom Office in the financial year of 2001/02 (2058/059 BS): such items were imported amounted to 85523 kg, which cost approx. NRs. 13,00,000.00 (approx. USD 17,333.00). Therefore, the minimum cost of one frog could be NRs. 25.00 (GORKHAPATRA, 2003). Such data showed us the actual quantity of consumption in Nepal.

In Kathmandu Valley, the requirement of Amrit Science Campus (organ campus of T.U.) are 1,000 to 1,500 frogs, being needed in each academic year for zoology practical classes. In this way, one sampled private campus, the National School of Education, allocates in its budget NRs 2000.00 for buying the frogs (REGMI, C. pers. comm. 2004) in every academic year.

Previously, *Uromastix* and *Chamaeleo*. had been imported from India for dissection, but presently it is banned. Therefore, it has been substituted by locally available perianthropic species of lizards (*Calotes versicolor*, *Hemidactylus* spp., etc). According to this survey (RAI, 2002); these species are common in Nepal. From the data collection of the Campuses of Terai (fig. 1), 40% garden lizards (fig. 3) and 60% wall lizards were recorded as being used in dissection. *Hemidactylus* sp. are perianthropic species and easily available in or at the vicinity of houses. Whereas *Calotes versicolor* are found in wild scrubs and in forests and are more difficult to collect.



Figs. 2-5 clockwise: 2) Collection of frogs for dissection at Mechi Campus in East Nepal. 3) Collection of *Calotes versicolor* in Zoology Dept., P.G. Campus, T.U. at Biratnagar. 4) Displaying dissected frog in the Zool. Lab. of Mechi Campus, Bhadrapur, Jhapa. 5) Students at dissecting work in the Bio Laboratory of BHSS, Birtamod; Jhapa



## Results

The total enrolment of science students in the intermediate level at T.U. (2001) was 6539, at K.U. 439 and in 10+2 level, 24368. There is wide distribution of T.U. campuses. Out of the total number of science students; there are 1236 in the Eastern Development Region, 3736 in Mid-Development Region, 1,095 in Western Development Region, 183 in Mid-western Development Region and 302 in Far-Western Development Region respectively (table 1). According to the practical course, 5 specimens of dissecting material are needed per student to complete all sections. The necessary required number of frogs was calculated to be 32595 at T.U. Campuses, 2195 at K.U. and approx. 12000 at Higher Secondary Schools (table 2).

Campuses of Institute of Sc. & Tech. Tribhuvan University	Level	Used frogs/year	Used lizards/year
	I. Sc. (Biology)	6,539X5 = 32,595	-
	B. Sc. (Zoology)	-	600X5= 3,000
	M. Sc. (Zoology)	-	150X5 = 750
School of Science, K.U.	I. Sc. (Biology)	439X5 = 2,195	-
Higher Secondary Schools HMG	10+2 (Biology)	2400X5= 12,000	-
Approximately	Total specimens	<b>46,790 / year</b>	<b>3,750 / year</b>

Table 2: Survey on Estimated Number of Frogs and Lizards for Dissection in 2001. Source: Self (pers. comm. Campuses 2002)

In the course of biology, dissection work on frogs is compulsory (fig. 4 & 5). In the same way at bachelor and master levels of science, a zoology course needs vertebrates for dissection. Total enrolment of science students in bachelor and master level at T.U. was 4921 and 1159, and K.U. 245 and 14 respectively (tab. 1). About 10 per cent of total students of B. Sc. or M. Sc. would study zoology. Therefore, as per data, with a calculation of five lizards per student, the approximate consumption numbers were found to be 3000 lizards in Bachelor and 750 lizards in Master, in each year (tab. 2). Therefore, the result of data calculation showed that 46790 frogs and 3750 lizards are killed in schools and campuses in Nepal every year.

Stored Specimens	Mechi Campus	Biratnagar Campus	Dharan Campus	Rajbiraj Campus	Siraha Campus	Total	Species%
<i>Hoplobatrachus tigerinus</i>	140	75	70	30	40	355	40.2%
<i>H. crassus</i>	15	15	5	5	5	45	5.2%
<i>Limnonectes spec.</i>	69	130	50	50	45	344	39.0%
<i>Euphlyctis cyanophlyctis</i>	8	80	25	15	10	138	15.6%
<b>Total</b>	<b>232</b>	<b>300</b>	<b>150</b>	<b>100</b>	<b>100</b>	<b>882</b>	<b>100%</b>
<i>Calotes versicolor</i>	10	50				60	40%
<i>Hemidactylus spec.</i>	15	75				90	60%
<b>Total</b>	<b>25</b>	<b>125</b>				<b>150</b>	<b>100%</b>

Table 3: Survey of preserved Herpetofauna from the Campuses of East Nepal

Stored Specimens	Birta HSS	Damak HSS	Birat. HSS	Total	Species %
<i>Hoplobatrachus tigerinus</i>	45	30	35	110	9.0 %
<i>Hoplobatrachus crassus</i>	24	14	20	58	4.8 %
<i>Euphlyctis cyanophlyctis</i>	390	70	60	520	42.7 %
<i>Limnonectes teraiensis</i>	86	52	40	178	14.6 %
<i>L. nepalensis</i>	39	21	34	94	7.7 %
<i>Limnonectes spec.</i>	52	85	120	257	21.2 %
<b>Total</b>	<b>636</b>	<b>272</b>	<b>309</b>	<b>1,217</b>	<b>100 %</b>

Table 4: Data of Dissecting materials (frogs) stored in Higher Secondary Schools in East Terai (2003);  
References: Higher Secondary School (HSS)

## Discussion

Human activities modify natural environment and, hence, the physiological processes which have implications at local, regional and global levels (SETH, 2000). Wetlands are necessary for frogs and forests are necessary for lizards. The perianthropic amphibian species generally breed in stagnant water and are rather tolerant of pollution (MASKEY et. al., 2002). INGER (1999) cites the following Nepalese species, some of which are locally very common: *Bufo melanostictus*, *Kaloula (pulchra)*, *Microhyla ornata*, *Limnonectes* spp., *Hoplobatrachus tigerinus*, *Euphlyctis cyanophlyctis*, *Hylarana taipehensis*, *Polypedates leucomystax*. According to the present survey, apart from *Hoplobatrachus tigerinus*: *Limnonectes* spec., and *Euphlyctis cyanophlyctis*; *Hoplobatrachus crassus* was also found to be commonly used for dissecting purpose in East Nepal. Among the reptiles, geckos live in human dwellings and other constructions of stone, concrete, wood or bamboo—ranging from the lonely hut at the margins of the forest to large cities (SCHLEICH & KAESTLE, 2002; KAESTLE et.al, 2013). The common garden lizard (*Calotes versicolor*), originally a dweller of sunny forest margins, has widely profited from large scale deforestation and now lives around human habitations on bushes, small trees and hedges (MASKEY, et al., 2002). Therefore, these species of frogs and lizards were previously thought of as very common in herpetofauna, and nobody expected their early decimation. But it is true that once held simplistic views turn out to be complex later. Thus, to maintain the number of such disappearing species, only action taken now could ultimately protect these species from environmental disaster in future.

The potential impact of human judgment and action on herpetofauna, are infrequently studied and, even when it is done, it attracts very little interest in the overall assessment of protected wildlife. The human populations increase dramatically, causing environmental destruction and eliminate the natural habitats, modifying the environment on such a large scale that many species are in danger of extinction (DUELLMAN & TRUEB, 1986). Still worse, is the fact that school and university courses were supplied with herpetological material imported from India (MASKEY et. al., 2002). Thus it is no wonder that from the very beginning the University courses of B.Sc. contained *Uromastix hardwicki* (a protected CITES species!!) for teaching, but “luckily” it has been replaced by *Calotes versicolor* (fig. 3) for dissection purposes throughout the country in Nepal.

After banning the import of dissection material from outside (India), the commercial suppliers started collecting these species from their natural habitats. As a consequence each year 46,790 frogs and 3,750 lizards are being killed for academic studies. Thus, another conservation problem has arisen in Nepal. If such wanton consumption by educational institutes is allowed to continue unchecked, it is foreseen that after several years only empty land will remain here.

## 5. Conclusion

Previously, it was very common to collect these animals in India without any conservation knowledge, but now its negative impacts are realized and stopped by law. Right now, a similar situation exists in Nepal, where collecting in the name of education is done frequently from Terai lowlands. Although not yet as serious, if collection is allowed to continue unchecked and without raising public awareness of conservation, then the future of such animals will be threatened. During the last four decades, education has played an outstanding role to rapid progress. This survey has found dissecting work for biology education is the main reason for causing the depletion in numbers of certain amphibians (Genera: *Hoplobatrachus*, *Limnonectes* & *Euphlyctis*) and reptiles (Genera: *Calotes*, *Hemidactylus* etc.). The direct impact on the number of frogs and lizards by educational activities is clearly seen. Therefore, for protection and conservation of these species, natural habitats should be protected by national law. Legal provision could be made to enable the interested individuals, organizations or groups to farm such species in captive breeding or at semi-natural habitats for ex-situ conservation to meet the demands of utility. If possible, each campus and institute could manage ponds for frog farming (and also for environmental education), and luxuriant gardens or old houses for gecko and lizard farming. Additionally, it could be said that an alarming situation is approaching here with a need to find other options for dissection of herpetofauna using electronic media (HS 2003, pers. comm.) for the students of educational and research institutes.

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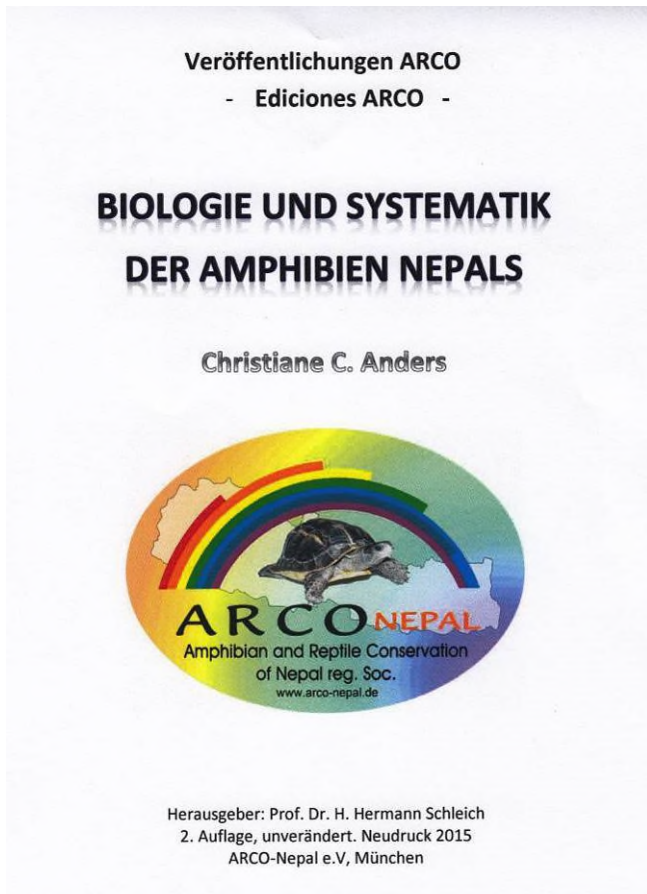
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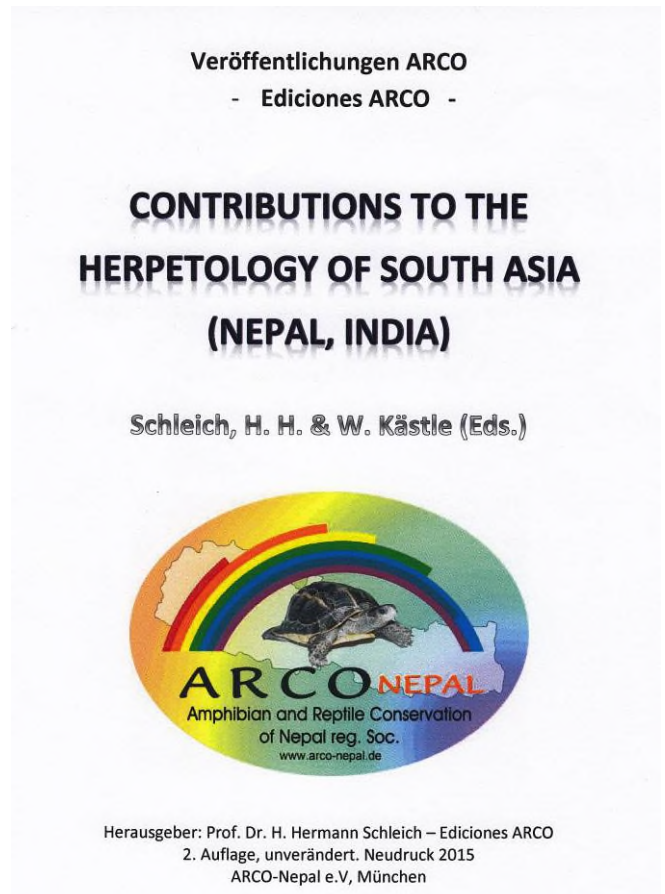
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