

ASSESSMENT OF LKA 027 PROJECT 250/3:

**CONSERVATION ACTIVITIES
IN BLOCK IV OF YALA NATIONAL PARK AND
ELEPHANT CONSERVATION CONFLICTS IN
HANDAPANAGULA,
Sri Lanka**

NORAGRIC
BIBLIOTEKET
Postboks 2
N-1432 AS-NLH

By

**Professor Per Wegge (Team Leader), Harshana Rajakaruna (Project Officer),
M.M. Wijayasena (Asst. Director), W.A.R. Asoka (Planning Officer)**

June 1996

ASSESSMENT OF LKA 027 PROJECT 250/3:

**CONSERVATION ACTIVITIES
IN BLOCK IV OF YALA NATIONAL PARK AND
ELEPHANT CONSERVATION CONFLICTS IN
HANDAPANAGULA,
Sri Lanka**

By

**Professor Per Wegge (Team Leader), Harshana Rajakaruna (Project Officer),
M.M. Wijayasena (Asst. Director), W.A.R. Asoka (Planning Officer)**

June 1996

CONTENTS

	Page
Executive Summary	1
1.0 General Methodology	5
2.0 Evaluation of Block IV	6
2.1 Project history and objectives	6
2.2 Project organization	7
2.3 Implementation	7
2.4 Recommendations	10
a) Tourist development	10
b) Training and research	10
c) Elephant management	11
d) Road construction	13
3.0 The Handapanagula Conflict	14
3.1 Land use and the Pelwatte Sugar Company	14
3.2 Status of elephants and habitat	15
3.3 Alternative solutions	16
a) Linking the Handapanagula herd with Yala NP through a permanent corridor	16
b) Drive the Handapanagula herd to Yala or Lunugamwehera NP and contain it there	17
c) Elephant sanctuary at Handapanagula	18
4.0 General Recommendations	19
Appendices	20

**ASSESSMENT OF LKA 027 PROJECT 250/3: CONSERVATION ACTIVITIES
IN BLOCK IV OF YALA NATIONAL PARK AND ELEPHANT CONSERVATION
CONFLICTS IN HANDAPANAGULA**

Per Wegge, Professor, Agricultural University of Norway
(Team leader)

Harshana Rajakaruna, Project Officer, Ministry of Transport,
Environment and Woman Affairs, Colombo

M.M. Wijayasena, Asst. Director, Integrated Rural Development
Programme, Moneragala District

W.A.R. Asoka, Planning Officer, Department of Wildlife
Conservation, Colombo

Executive Summary

The activities carried out under NORAD LKA 027 project 250/3 in Block IV of Yala National Park were assessed by a four man team in December 1995. In addition to assessing the work carried out under the NORAD project, the team also evaluated the conflict between elephants and local communities near Handapanagula. The assessment was based on a four day field visit consisting of inspection of the construction works carried out in Yala block IV and interviews with local government authorities, representatives of the Pelwatte Sugar Company and affected local villagers. Information was also gathered through meetings with central DWLC authorities in Colombo and staff at Peradenya University, and from project reports and relevant published material on the Handapanagula elephant conflict. Because senior DWLC staff responsible for implementing project activities were not available in Moneragala, the team may not have received a complete picture of all activities accomplished.

The main findings and recommendations are as follows:

Block IV

1. Except for six elephant drives and elephant captures and construction of a DWLC sub-office, the other activities specified in the project document had been carried out. No explanation was available for not constructing the sub-office, whereas the elephant drives and captures had been suspended by agreement.

2. By the end of 1993, about 83% of the total allocated budget of 11.6 Mill.Rs had been spent on project activities. According to non-audited project reports, expenditures were generally in accordance with proposed costs, except for the circuit bungalow which had been overspent by >20 percent.

3. Except for the procurement of one vehicle and one tractor, none of the major activities had been implemented successfully to fulfill project expectations. The reason for the poor result was probably a combination of unprofessional planning, delegation of implementing responsibility to inappropriate local authority (DEA), alienation of local and central professional DWLC staff from active participation, and insufficient monitoring by the designated central authority (M/TEWA).

4. Five out of seven water tanks reported to have been developed, were found. None of these were well constructed and only one or possibly two held water during the dry season.

5. Although not confirmed by exact field assessment, much less than the 120 km of jeepable roads had been built. The roads were well designed with minimal negative impact on the forested environment. With proper maintenance, the simple standard adopted is appropriate and adequate for the purpose.

6. A 25 acre plantation of woodapple (and possibly other palatable food plants) reported to have been prepared according to project progress reports, was not found. If the site shown to the team was the correct one, then it is incorrectly located on the map and no evidence of planted seedlings could be found.

7. Pasture improvement through the supply of reportedly 200 lorries of beru grass and distribution of Brakaria seeds to the new water tanks and water holes have largely been a failure. Little grass was found and one tank was contaminated with Salvinia weeds brought in with the beru plants.

8. A circuit bungalow had been built in an ecologically inappropriate location appr. 1-2 km from the western park boundary (Kataragama-Buttala highway). Besides being of poor architectural design (as was the entrance portal near the highway) the bungalow did not have any form of power supply, and it was suffering from poor quality construction and maintenance.

9. It is recommended that:

- Yala block IV not be developed and managed for commercial tourism, but rather be prepared for low volume, largely self-sustained ecotourism. The main reason is that the densely forested block is not suited for regular tourist visitation, and that disturbance from large-scale tourism is not compatible with preservation of the particular forest type found there.

- the circuit bungalow be modified and used as a regional training and research station for park management needs and for biodiversity studies of the particular forest ecosystem which characterizes this part of Yala NP. Administered and supervised by the DWLC, operationally the implementation should be a joint undertaking between the DWLC and Peradeniya University. The departments of zoology and botany at PU are well prepared to offer relevant field training and to undertake research in Yala blocks III, IV and V that are needed by the DWLC. Other institutions may also be invited to use the facilities, which through appropriate cover charges would generate enough funds for maintenance.

- DWLC management capacity be increased through allocation of more field staff to blocks III, IV and V and through advanced technical training of medium and senior level staff members, and infrastructural development. Plans for enhancing institutional competency will be outlined in the forthcoming report from the ongoing GEF project and should therefore follow these recommendations.

- more roads, of the same quality and design as prepared in block IV, be constructed in blocks III, IV and V. The road network should not be excessive, but designed so as to provide for more effective law enforcement.

- habitat improvement with the objective of increasing the carrying capacity for elephants - or more precisely: to hold more elephants within park boundaries during the dry season - should proceed as planned. Recently built tanks in block IV should be repaired and re-enforced to all-year water capacity. Any new tanks in that block and in block III should be built in the interior to draw elephants away from cultivation along the western boundary. Promoting the production of palatable grass and browse should proceed more cautiously. Non-indigenous plants should not be introduced. Manipulation of the density of the natural forest canopy and understory to promote grass may be conducted on a small-scale, experimental basis prior to wider application.

- to assure proper implementation of any conservation project in the future, a different organizational structure is needed. The decentralized mode of operation with implementing responsibility delegated to the GA in Moneragala (former DEA) and monitoring centralized in Colombo (lately by M/TEWA) has not functioned well. A much more active role should be played by the GA which is the beneficiary of the project (in this case the DWLC) in order to nurture self-interest and develop professional responsibility in that department.

- a buffer zone management programme be designed and implemented without delay in a 1-3 km wide strip around the park boundary (blocks IV and V in Moneragala District). The organizational structure and mode of implementation should be discussed with local government authorities and representatives of the affected local communities. The

programme requires careful planning and identification of priorities. Initial funding may come from external sources supplemented by government support, but the programme should in the long term be self sustained. The ongoing GEF project at the DWLC may propose plans on how to proceed with this important component of park management.

Handapanagula Elephant Conflict

The conflicts which the elephants now pocketed at the Handapanagula water reservoir cause to the local villagers have reached a proportion which requires remedial action without delay. The conflicts between conserving elephants, economic development of poor local communities and safety of people and their property are quite complex, and any solution will be a compromise between largely incompatible options.

Recommendations

- The priority recommendation is that all 120-140 elephants currently pocketed near the tank be driven into Yala block V or Lunugamwehera NP just before the start of the rainy season. If to Yala, the animals should be driven along the perennial Kudu/Menik river into block V. Preferably, some if not all animals should then be driven further east across the highway into block III.
- To prevent animals from leaving the Park, the boundary should be closed with electric fencing. The new fence should extend from the Kataragama-Buttala highway westwards around block V and across the northern boundary of Lunugamwehera national park, a total distance of approximately 25 km. At critical locations along this fence, trenches should also be built.
- In connection with the drive, or as a separate exercise, the tuskered males should be captured and transported for release deeper into the Yala park or to another protected area where the probability of breaking through electric fencing is less. Removing the tusks by sawing them off near the base will also reduce the risk of the tuskers breaking through the fence and returning to Handapanagula. Although the animals will be behaviorally affected initially, such removal is not expected to have adverse long-term effects.
- After the elephant exodus, the forest area next to the tank should be declared a forest reserve and managed as a catchment area principally for water conservation. This means that excessive number of livestock which now occupy the area illegally, need to be relocated elsewhere.
- An alternative, but lower priority solution, is to establish a permanent elephant sanctuary in Handapanagula. This calls for relocating the livestock and driving most of the elephant herd at Handapanagula to Yala but leaving about 20 animals behind. The current area of forest habitat would have to be enlarged

to roughly 2200 hectares by including blocks 3 and all or parts of blocks 4 and 5 of Palwatte Sugar Company, a smaller section of Neluwagala village and the state forest northwards to the Wellawaya-Buttala road. The whole area should be sealed off by effective electric fencing and trenches where needed. Management of the "Handapanagula elephant herd" would also require regular culling or removal of individuals to keep numbers within the carrying capacity of the habitat and the occasional importation of males from other herds to maintain genetic variability. This option is feasible, as the settlers in block 3 and 5 of Pelwatte S.C. have already been offered alternative land elsewhere and the people of Neluwagala were positive to this solution if all families (71) could be relocated.

- Even if agreeable to the local residents and effective measures against crop depredation are installed, establishing a small elephant sanctuary at Handapanagula is not considered a good option for the following reasons:

- a) The drive will have to be done anyway
- b) It is, at this stage, uncertain if the food and habitat quality of the ca 2000 hectare sanctuary will be adequate for maintaining approximately 20 elephants in good physiological condition on a permanent basis
- c) Confining large mammals in a small area disrupts the social organization and spatial distribution pattern, which may lead to abnormal and aggressive behavior, especially among males
- c) Management will be quite expensive (building and maintaining electric fences and trenches, capturing, transporting and/or culling of tuskered males and excessive numbers, and general monitoring)
- d) Even at reduced density, elephants in the sanctuary will contribute to continued siltation of the water reservoir (which already is excessive)
- e) Keeping elephants at Handapanagula contributes little if anything to the overall objective of conserving elephants in Sri Lanka.

1. GENERAL METHODOLOGY

The TOR were quite ambitious considering the short time available. Therefore, the team split the tasks with Mr Rajakurna and Mr Wijayasena being mainly responsible for collecting information on the socio-economic aspects of the Handapanagula conflict, and Wegge and Asoka dealing with the Block IV development works and the elephant management problems. The provision of a second vehicle made this possible and greatly facilitated the completion of the field assignment.

Information was mainly collected through interviews with relevant district and central authorities, local leaders/grama niledaris and villagers (see appendix), and through field inspection of construction activities in block IV. Unfortunately, the DWLC Ranger in Moneragala who is

responsible for management of block IV was not available. The assistant ranger accompanied the team instead. He had experience with the elephant conflicts in Handapanagula but limited knowledge about the NORAD project activities in block IV. Supplemental information was sought from other DWLC staff stationed at the bungalow and at Galge, but this information was also incomplete, especially regarding the water tanks and the plantation. Reports submitted by the District Environmental Authority (DEA) provided information on implementation and costs of the project until and through 1993.

2. EVALUATION OF BLOCK IV

2.1. Project history and objectives

The LKA-027 project 250/3 document presents the main objectives and the underlying rationale for undertaking construction activities in Yala block IV:

- a) provide for increased tourism in this part of the Yala protected area system with the ultimate goal of generating revenues and employment to Moneragala District,
- b) reduce the elephant conflict outside Park boundary in Moneragala District.

Both of these objectives are linked to the long-term Integrated Rural Development Project (IRDP) which NORAD has supported for a number of years in Moneragala. A survey among the local communities within the district had disclosed that crop damage and human harassment by elephants were considered a main problem and obstacle to the ongoing rural development efforts by IRDP.

The project proposal was prepared by the Central Environmental Authority (CEA) in collaboration with the Department of Wildlife Conservation (DWLC) and was approved by NORAD in late 1991. With a total budget of 11.9 Mill. Rs over a three year period, the approved project specified the following objectives:

- Construction of 120 km of jeepable roads inside block IV
- Construction of a circuit bungalow inside the block
- Construction of 6 water tanks (old wewas) and 9 water holes in block IV
- Habitat improvement through planting/seeding of palatable grasses around the new water tanks and water holes, and planting of fodder species on 25 acres of forest land after clearing
- Construction of a DWLC sub-office at Devalamankada
- Procurement of 1 double cab pick-up and 1 4-wheel tractor and trailer
- Conduct six elephant drives to drive elephants out of two conflict areas

- Execution of an elephant capturing programme

2.2. Project organization

According to the approved project document, the DWLC was to be responsible for project implementation under the supervision of the the District Environmental Authority (DEA), Moneragala. When administration of NORAD's Environmental Programme was established in the new Ministry of Transport, Environment and Women's Affairs (MTEWA), this Ministry took over the supervision and monitoring of the project. This organizational structure has not functioned well (see assessment).

2.3. Implementation

Written accounts of project implementation were available for the period up to end of October 1993. At this time, ca 83 percent (Rs 9.6 Mill) of the total allocation (11.6 Mill. Rs) had been spent (see Table). Two proposed activities (elephant capture and elephant drives, totalling 2.3 Mill) were suspended. Instead, it was agreed that some of the funds allocated for elephant drives should be used for additional water tanks and solar electric lightening in the circuit bungalow. This has not been completed. The status of the water tanks is quite obscure: only 5 tanks could be shown to the team, but according to written reports a total of 7 tanks have been constructed. Also, the DWLC sub-office had not been implemented. No explanation was given for this.

The table summarizes the achievements in block IV. Due to lack of adequate guiding in the block (see 'methodology' above), the team may not have received a complete picture of the status of roads, water tanks and fodder plantation. However, accompanying DWLC staff who had been there for several years could not clarify the inconsistency between reported achievements and what we could find during our visit. The team had no access to audited accounts. However, as there were also inconsistencies in some of the figures and information provided in the reports from the DEA office, it is clear that both the reporting and monitoring of this project have been unsatisfactory.

It is unclear whether the project was actually implemented by the Wildlife Department as specified in the original approved project document. Rather it appeared as if the project had not only been supervised by the DEA office in Moneragala but that this office had also implemented it with rather passive participation of the DWLC. Whatever the case may be, it seems clear that the local DWLC office failed to communicate project activities with DWLC headquarters in Colombo or with Yala Park HQ in Kataragama, as these offices had virtually no information on the NORAD project in block IV. Similarly, there has been little monitoring of project progress and achievement by the MTEWA from Colombo.

Status of approved and implemented activities under NORAD LKA-027 project 250/3 project as of December 1995. Accounts as of November 1993 (Mill. Rs)

Activity	Funds Appr	Actual Expend.	Diff %	Remarks
6 water tanks	1.8	1.8	0	Only 5 tanks could be located. Most tanks poorly constructed with insufficient capacity
1 water tank	?	0.431	?	Palugas wewa constructed for unspent funds for elephant drives. Costs inconsistently reported
Circuit bungalow	1.2	1.449	+21	Poor location and design. Poor construction and maintenance
Solar panels	yes	0		Not installed
DWLC suboffice	0.4	0		Not implemented
Habitat improvement	0.8	0.843	+ 5	Unsuccessful. Salvinia contamination in at least one tank from introduction of Beru grass. Little grass regeneration at water sites and no browse regeneration in cleared forest patch.
120 km roads	2.5	2.561	+ 2	Roads constructed, but distance less than 120 km. Well designed and maintained.
Elephant drives	1.8	0		Agreed to suspend 6 drives
Elephant captures	0.5	0		Agreed to suspend captures
Vehicles	1.3	1.286	- 1	As approved
Implem.	0.555	0.543	- 2	Within approved budget
Conting.	0.793	0.760	- 4	Within approved budget
TOTAL	11.649	9.618	-17	As of November 1993

A circuit bungalow has been constructed in the forest about 1 km distance inside from the Buttala-Katagarama highway. A total of 5 water tanks and 9 water holes have been developed in strategic locations in the western part of the block. The sixth water tank was not found. The local guides - employees of the DWLC stationed in block IV - did not know about this tank, but we were later informed that this was a natural rock

tank that had not been modified through any construction activity. According to available documents, a 7th tank - Palugas wewa- should also have been constructed; however nobody could confirm that this tank had ever been built.

None of the tanks were in good condition. Due to poor construction work, most of them contained little water. Failure to perform according to projected capacity was due to excessive siltation from bank erosion, weak bunds containing woody debris which inevitably become erosion spots leading to bund breakage, and eroding and wrongly placed spillways. Another problem with the tanks was that many of them, due to shallow water levels and gently sloping embankment, were excessively used by wallowing buffaloes. In none of the inundated water pools had the trees been salvaged and removed. When waterlogged, trees die. The standing dead snags in the water tanks are not an attractive sight and they should probably have been removed if the block was to receive regular tourists. However, ecologically the dead trees provide habitat for woodboring insects and a wide range of birds, including nesting sites, and they will therefore increase local biodiversity.

Habitat improvement had been attempted by supplying 200 lorries of beru grass from Lahugele and planting this along the newly constructed tanks and water holes. Some seeds of Brakaria were also said to have been distributed to revegetate the bunds of the tanks. Lastly, a large forest patch had evidently been cleared for planting of woodapple and possibly other browse species. However, all these "fodder enrichment" activities have failed, as only a few spots of beru grass were present at some of the water sites. One tank was contaminated by Salvinia weed, presumably brought in along with the beru grass. No evidence of woodapple could be found; instead the forest clearing was overgrown with a dense cover of unpalatable brush species.

The team did not get an opportunity to check all roads that had been constructed under the NORAD project. However, the team was left with the clear impression that much less than the proposed 120 km had actually been built. But the roads that had been established were well constructed with seemingly little negative impact on the natural environment. The bungalow, (and an entrance portal built for the inauguration and opening ceremony of this block, not part of the NORAD project), on the other hand, were not appropriate for a national park. Besides being of tasteless architectural design, the bungalow is situated in an ecologically sensitive spot too close to a grassy depression which is frequently used by wildlife. The depression has been excavated and made into a water hole within viewing distance of the bungalow. The new bund surrounding this hole is eroding, causing siltation of the hole and presenting an ugly scar in the natural setting.

More important, the bungalow has been poorly constructed, as all plumbing in toilets/bathrooms were leaking and/or handles broken. A serious leakage was also discovered in the concrete flooring of one of the rooms on the second floor, seeping through the wall below. Windows were rather small which prevents good ventilation. Presumably, lack of ventilation was also the reason why one of the original rooms was later modified into an open balcony with beds under the open roof - a solution which appeared practical under the circumstances of no electric fan ventilation. Another potential construction problem was the location of the septic tanks. The discharge is emptied into two 7 m deep tanks located within 5 meter distance of the fresh water well. Although the water level during the dry season was at a depth of >20 meters, during the rainy season it is probably much closer to the level of the septic tanks. Due to the close proximity, the water well may sooner or later become contaminated from the septic tanks.

The bungalow has no electricity. This is a major drawback, as such is needed for accomodating visitors, both for providing light and ventilation, and for kitchen duties. According to project documents, electricity was supposed to be installed with solar panels in 1993, but this has not been done.

2.4.Recommendations

a) Tourist development

The original idea of opening up block IV for tourism development was not based on a management plan for the Yala system of Protected Areas. Such a plan is now being developed under the ongoing GEF project. Available information indicates that the Yala block IV contains the largest continuous tract of natural and largely undisturbed dry, evergreen forest in Sri Lanka. Presumably, this particular forest type is now quite rare and contains unique fauna and flora that have not yet been properly described. Hence, it has a very high priority for biodiversity conservation. Commercial tourism may not be compatible with preservation of this particular forest ecosystem. Moreover, the dense forest which covers more than 90 percent of the area of block IV offers little opportunity for viewing wildlife - the most important factor for tourist visitation to national parks. Block IV should therefore not be developed for such tourism. Instead, the undisturbed jungle with its particular features and unique ecology is well suited for low impact ecotourism. Visitors under such a scheme should be largely self-sustained but provided with simple camping facilities at designated camping grounds. Trails for walking safaris may also be cleared, but the overriding consideration should be to minimize physical impact and disturbance.

b) Training and research

Ideally, the two physical structures - the circuit bungalow

and the entrance portal - should be removed, as they serve no needed function if commercial tourism is not going to be developed. However, the bungalow may be put to some good use: it could serve as a training and field research center for DWLC and university staff and students. The fauna and flora of the northern blocks of Yala NP are not well known, and the recent "discovery" of the uniqueness and rarity of the dry evergreen forest type with its associated biodiversity makes block IV a particularly important and attractive site for ecological research. No such facility is available elsewhere in the region. After some minor modifications and repairs, the bungalow can accommodate 8-10 visitors. Informal discussion with Peradenya University (Dr. Charles Santiapillai and Dr. Gunnatillake) showed that such a facility was in great demand and would provide an attractive opportunity for initiating field studies by staff and students. When coordinated by the DWLC, such research should be designed to provide specific information needed by park management. In addition to serving as a field site for university and DWLC collaborated research, the facility could also be used for organizing periodic training and demonstration for DWLC technical field staff and other interest groups. The forest ecosystem of northern Yala is quite different from the better-known southern part and therefore requires different skills and monitoring techniques by park staff.

c) Elephant management

The ongoing efforts to improve the habitat of block IV for elephants should continue, especially if the elephants of Handapanagula are relocated to Yala. However, actions should be coordinated with similar objectives in blocks III and V and be based on an overall management plan now being developed under the GEF programme. When developing a habitat management plan for northern Yala, the following points should be considered:

- If preserving the dry evergreen forest type is the highest conservation priority for this part of Yala, any habitat modification should be designed so as to have minimal impact on the naturalness of this forest type.
- Lack of perennial water (and not food) is probably the main reason why elephants traditionally move(d) out of block III and IV during the dry season
- The high ratio of tall and dense forest to grassland dictates a relatively low carrying capacity of elephants irrespective of water supply. Hence, even if perennial water is made available at various points within the two blocks, these northern parts of Yala will not sustain as high a density of elephants as the southern blocks.
- If water is made readily available, elephants will become more sedentary. Combined with increasing numbers, this may lead to impact on the forest vegetation, especially in the

vicinity of the watering points. If so, the forest will be structurally and floristically modified; thus the "naturalness" of the forest type will be affected.

- The above scenario is, at this stage, based on qualified guesswork. It is also possible that even in the presence of

perennial water throughout the northern blocks, elephants will roam widely and redistribute themselves in other parts of Yala and adjoining Lunugamwehera national park, thus minimizing and postponing localized impact on the forest habitat. However, with restrictions imposed on their natural dispersal in the form of electric fencing and no prescribed culling, numbers will inevitably increase to the point that they will modify their forest habitat. Hence, in a longer time perspective, the natural dry evergreen forest type that may now have highest priority for biodiversity conservation, is apt to be changed by elephant impact if elephant numbers are not controlled through culling inside the northern blocks in the future.

From above, it follows that habitat improvement should not be concentrated to block IV only, and it should not be excessive. Furthermore, provision of pasture - or fodder - should not be a priority. In general, non-endemic plants should not be introduced into a national park, and even if propagation of local and palatable species could be done successfully, this would mean modifying the natural forest through land clearing which is not compatible with preserving the continuous forest type. Elephants are large mammals which require large quantities of food; hence in order to contribute as a food source, relatively large patches are needed. Also, provision of nutritious and palatable beru and Brakaria grass around the water tanks is questionable, as this may lead to more concentration of elephants and buffaloes which again accelerate adverse animal impact on the vegetation there.

If the forest type mapping project now being done by the Forest Department should disclose that the dry, evergreen type is more widespread and not confined mainly to block IV, then the DWLC may consider to "sacrifice" more of this type in block IV in order to accommodate more elephants. This would imply converting mature forest into patches of plantations of mixed, palatable browse through land clearing and burning. Unlike the water points, the man-made food patches should not be too large (<5 hectares each) and be widely distributed throughout the block in order to minimize concentration of elephants. In order to promote more grass - which is the minimum factor in terms of food - experimental forest cutting should be carried out on a small scale to develop techniques whereby palatable grass is promoted in the understorey. The park staff already has some experience with this as seen in block IV. Here, along the forest roads and around the bungalow, the forest had been thinned and the understorey brush cleared, presumably to facilitate game viewing by tourists. Opening the canopy and removing the brush to a

certain density level evidently stimulated vigorous growth of one grass species which is palatable to several wild herbivores, including elephants. Grass may also be promoted around the water tanks to reduce erosion of the bunds, but before large scale planting and seeding is done, methods of propagation should be carried out on a smaller scale with different indigenous species.

At the moment, five or six old wewas have been opened up in block IV. Most these are relatively close to the western boundary of the park, only two are some distance from the highway. In block III there are two tanks, both in the far south. There are currently plans to develop three more tanks in block IV and two additional tanks in block III. Because provision of water is the most important requisite for holding more elephants in these blocks, these plans should be realized. However, it is questionable if as many as three more tanks are needed in block IV. In any case, all new tanks should be located in the interior of the blocks, away from the accesspoint to cultivated land along the western boundary: the two new tanks in block III should be constructed near the northern boundary against block IV and the new tanks in block IV as far east/south east as possible near Kambukken oya. Also, all tanks should be constructed with the sole objective of providing water throughout the dry season. This means that they should be relatively large and deep and solidly constructed. Preferably, the embankments should be steep enough to discourage wallowing by buffaloes. By distributing the permanent water points among fewer and larger tanks, elephants will probably be induced to move more inside all the blocks and therefore cause less localized impact on the vegetation around the tanks. Fewer tanks also means less disturbance to the natural environment in terms of construction and access roads.

d) Road construction

According to reports, the new roads have proved effective for law enforcement in block IV. In the northeast, illegal gemming have been better controlled and encroachment and poaching are more easily monitored. Although a complete picture of the current road network was not obtained during the short field visit, it appeared as if the total length of roads was far less than the projected 120 km, and also less than the 80 km reported to have been completed. Also, due to lack of resources, roads were not adequately maintained. It is recommended that a network be completed that links all peripheral parts of the block to provide a circuit from the bungalow/the access road at the highway. However, roads should be as widely spaced as possible, as the objective is not to provide for maximum motorable transport but rather to provide access to various parts of the block mainly for patrolling purposes. Most likely, some 30-50 km of jeepable roads still need to be constructed in block IV. There are no roads in block III, except for the boundary road eastwards from Galge. In block V, there is only one short (<2km) access road to a

large renovated water tank. More jeepable roads need to be constructed in both of these blocks, the exact distances and locations to be outlined in the upcoming management plans for these blocks.

3. THE HANDAPANAGULA CONFLICT

3.1 Land use and the Pelwatte Sugar Company

In 1984, Pelwatte Sugar Company (PSC) leased (for 30 years) large tracts of land immediately west of block IV of Yala national Park. Subsequently, the forests were cleared for sugar cane cultivation. A factory was established in 1986. Currently, the annual production is appr. 50 000 tons which is roughly 30-35 % of the total national production or 1/10 of the national requirement. PSC has about 1250 permanent workers, but also employs 20-30 000 casual labourers. 400 workers are employed to guard the plantations against elephant damage. Within the plantation blocks, **settlers** have 4.5 acres for exclusive sugar cane cultivation and 0.5 acres for own production (home garden) and housing for which they pay a yearly rent. PSC extends credit to settlers but claims 24% interest on all advance payments. Settlers are guaranteed a market for the cane they produce (to PSC) at a fixed price. PSC may sell their cane to other sugar factories for a higher price.

Suger cane is also cultivated outside the PSC plantation blocks by **outgrowers**, estimated at about 7500-8000 people. More than 50 % of the total PSC intake of cane comes from the outgrowers. They may sell their cane to any company of their choice, and they have some bargaining power regarding price, as they are also union organized. They get fertilizers and herbicides at whole-sale rate and seeds, machinery and technical advice on directs payment from PSC. However, outgrowers do not enjoy the security of a market for their cane to PSC like the settlers do, and are not eligible for advance payments or loans from PSC.

Sugar production is based on extensive use of fertilizer (urea) and herbicides (Grammoxone). Although not conclusively confirmed, more than prescribed dosages are used, which may pose environmental hazards and land degradation in the long term.

PSC has built electric fences around most of the blocks and the southern part is now completely sealed off. Damage due to elephant crop depredation was claimed by PSC to have been Rs 80 million since 1988, with total damage in 1994 being Rs 4 million. PSC expenditures on protection was reported (by PSC) to be ca Rs 50 million/year (including building a trench for Rs 10 million). Construction cost for electric fencing was reported to be ca Rs 150.000 per km.

The power source for the electric fences was apparently not adequate and trenches filled up with water during the rainy

season. Since 1992, the Department of Wildlife Conservation (DWLC) has maintained a small office in Handapanugula to assist in preventing elephant damage. Besides operating a tractor with night spot lights, fences are regularly checked and maintained. Total expenses over the last 3.5 years have been roughly Rs 3.3 million. The DWLC has also helped to establish an insurance policy for people in Handapanugula (since 1992).

Compensation for elephant damage is restricted to deaths and damage to houses. So far, 20 people have been killed of which only one family has been compensated (with Rs 30.000). 162 houses have been damaged, of which 12 have received compensation in the range of Rs 400 to 2000 out of an estimated average damage of Rs 10.000/house. Processing time for compensation claims is long and bureaucratic and may take up to four years.

Besides sugar cultivation, most of the land around Handapanugula and adjoining block IV of Yala NP is now cultivated by subsistence farmers that have moved in both legally and by encroachment. Common crops are cowpeas, pigeon peas, paddy, banana, ground nuts, maize, tobacco, coconuts and mangoes. Experiments with sericulture and dairy farming conducted by the IRDP have shown promising results. In recent years, a large number of livestock (between 2.000 and 8.000, exact number impossible to obtain) have illegally immigrated and taken up permanent residence in the small degraded forest north of the reservoir where also the elephants occur. Together, the grazing and trampling by all these herbivores are contributing to significant erosion and sedimentation of the water tank.

3.2 Status of elephants and habitat

The Handapanugula water tank was constructed in the 1950s. It collects water from a large catchment area in the north. The remaining forest of roughly 6 square miles now contains more than 100 elephants and a large number of livestock. Most of the area is enclosed by electric fences; only in the north and NW is movement still unobscured by fences. The exact number of elephants is unknown. A census in 1993 gave a figure of 120 animals. Numbers were said to have increased since then to about 140. During the last four years, 40 elephants have died from injuries inflicted by the local villagers; 18 in 1995 alone. Due to the constant threats and damages caused by the elephants, locals are using all possible means (including firearms) to protect themselves and their properties. Thus, a large number of animals are physically injured, and the harassment is said to have increased their aggressive behavior.

The composition of the population is probably heavily biased in favor of females, otherwise the large number of deaths would have reduced total numbers. Reports confirmed that the population is breeding well and producing offspring. Compared

to other elephant herds in Sri Lanka, the Handapanagula population was reported to have the largest proportion of tuskered males: 14 such individuals were said to be contained in the forest patch north of the reservoir.

According to interviews, most of the damage and crop raiding is performed by the tuskered males, mainly during night time. By using their tusks, the animals can break down the electric fences without self-inflicted pain. Presumably, other non-tuskers and family groups then get access to the plantations.

Prior to the establishment of the Pelwatte Sugar Company, the then more sparsely inhabited forest area around Handapanagula was used by elephants which seasonally roamed over a much larger area, including Yala national park. During the dry season, water is scarce in this region of the country and occurred naturally only in the Kuda/Menik and the Kambukken oyas. With the establishment of the water reservoir and then later the sugar plantations, key elements needed by elephants - water and palatable food - became available in a localized area. This probably contributed to elephants becoming more sedentary. Later, when electric fences were constructed and more people moved in and settled, the elephants became trapped in the remaining forest north of the reservoir. According to local informants, no elephants now occur in the vicinity south of the tank because the electric fences and guards effectively prevent them from moving southwards. Also, elephants from Yala do not move all the way up to the reservoir, as they find water in the perennial Kuda river nearer blocks IV and V. Hence, the conflict area is mainly confined to the settlements west and east of the tank. North of the tank the degraded natural forest is not effectively fenced, but merges with middle aged teak plantations which extend almost continuously to the Wellawaya-Buttala road. With the high number of elephants pocketed north of the tank, damage to these tree plantations is now reaching significant proportions.

3.3 Alternative solutions

The conflict at Handapanagula has now reached a level where remedial action can no longer be postponed. In brief, the following solutions have been considered:

a) *Linking the Handapanagula herd with Yala NP through a permanent corridor:*

This has been proposed for a long time. An electrically fenced corridor would cross Pelwatte Sugar Company and the plantation to Yala NP. PSC would give up parts of their plantation in exchange for land elsewhere, and a section of the plantation has already been put fallow in anticipation of this solution. A proposal to establish the corridor outside PSC through natural forests has also been made. A recent decision at high governmental level against this corridor solution leaves this option no longer viable. The team also agrees that this

option should not be pursued further.

b) *Drive the Handapanagula herd to Yala or Lunugamwehera NP and contain it there:*

This seems to be the best compromising solution. Two alternative drives are being considered: 1) along Kuda Oya to Yala Block IV/V or 2) directly to Lunugamwehera NP. Both have advantages and disadvantages. Drive 1 is approximately 16 km, has water throughout the year, but is densely settled by farmers. In 2, fewer people will be affected, but this drive is longer (ca 20 km) with no permanent water. When completed, the border should be sealed with effective electric fencing and trenches where necessary. To contain the animals within the protected areas, a distance of approximately 25 km westwards from the Kataragama-Buttala road along the northern border of Lunugamwehera NP needs to be fenced at an estimated construction cost of nearly Rs 4 million.

The main argument against driving the elephants to Yala or Lunugamwehera has been that these areas cannot sustain that many elephants, and that they will break out of the park(s) and return to Handapanagula. These concerns deserve attention. Regarding the question of carrying capacity, it is undoubtedly true that the northern blocks of Yala NP (and probably also Lunugamwehera) has a rather low carrying capacity for elephants due to a predominately dense forest cover and little and patchily distributed water (northern Yala). However, with habitat and water improvement to be implemented in these blocks and the low current density of elephants (roughly 500 animals spread throughout an area of ca 150,000 hectares, or < 0.4 animals/sq.km), density is not expected to be raised to unsustainable levels, especially if animals distribute themselves and move regularly throughout all blocks and into Lunugamwehera. However, it should be recognized that if no control measures are adopted to maintain numbers at a certain density level, total numbers will increase with inevitable impacts on the environment within the parks in the future.

With respect to the fear of elephants returning to Handapanagula, two factors should be considered: 1) With effective electric fences and trenches, females and family groups will be deterred from breaking through, even with their habitually strong homing instinct. 2) If the reports from Handapanagula that tuskered males have "learned" to break through fences by using their tusks is correct, then such males do indeed present a risk factor. In order to safeguard against these animals from returning (their homing instinct known to be quite strong), it is recommended that the tuskered males be captured and de-tuskered before relocation to Yala or Lunugamwehera (or to other protected area). If not de-tuskered, the males should be driven deep into Yala block III to minimize the probability of their attempting to return.

After the relocation of the Handapanagula elephants, the forest north of the reservoir should be declared a forest reserve and managed principally as a catchment area for water conservation. The domestic stock that now occupy the area illegally should be evicted in order to halt the ongoing sedimentation of the reservoir.

c) *Elephant sanctuary at Handapanagula*

Instead of driving all the pocketed elephants from Handapanagula, an option of leaving a certain number there has been considered. This alternative must be seen in conjunction with the idea of promoting tourism in the area. Tourists are already now visiting Handapanagula through guided tours, and rumours indicated that PSC had already made plans of building tourist facilities nearby. This option may be feasible, but at substantial costs. In order to establish suitable habitat for a largely self-sustained small population, the present elephant area needs to be enlarged. By including the whole of block 3 and parts (or all) of blocks 4 and 5 of PSC and the state forest up to the Wellawaya-Buttala road, an area of roughly 2200 hectares could be secured. Considering the forage and habitat quality in this area, the total number of elephants to be contained here should not exceed 20-25 animals, i.e. a density of approximately 1/sq.km. All tuskered males should be removed along with most of the other elephants, which means that the drive would have to be implemented anyway.

The sanctuary option would also require substantial electric fencing along the northern boundary (mainly along the Wallawaya-Buttala road), relocation of the illegal domestic livestock, relocation of 71 families from Neluwagala village, and close control of elephant numbers to keep them within the carrying capacity of the sanctuary. This means removal of excess number as the herd increases. Lastly, in order to safeguard against detrimental effects of inbreeding, males from other protected areas would have to be introduced periodically. Management cost would certainly be quite high, and the ongoing sedimentation of the reservoir would only be partly reduced.

The positive element of the sanctuary option is that it could possibly provide for some tourist development with local employment and income generation, *if designed in an appropriate way*. Local people indicated that they were interested in such a management plan, provided they were guaranteed that the remaining elephants would not present any kind of threats to their daily lives.

The team concluded that the disadvantages and costs of the sanctuary alternative far outweigh any foreseeable benefits. Besides, this option is not expected to contribute to better conservation of elephants in the country.

4. GENERAL RECOMMENDATIONS

In closing this report, two main considerations should be emphasized:

a) Any follow-up of NORAD funding for conservation in Yala NP and/or Handapanagula should be planned carefully to avoid the problems experienced so far. The structure followed in the LKA 027 project 250/3 has not functioned well. In order to achieve agreed objectives, a different organizational structure and a clearer and more transparent auditing and reporting procedure is needed. Spreading responsibility among different central and district GA institutions should be avoided. If, or whenever, the Department of Wildlife Conservation is the main partner and beneficiary of NORAD support, then this GA needs to be mobilized and actively involved in all phases of project execution. A more active role of NORAD in monitoring of project activities is also recommended.

b) In the recently published booklet "Yala National Park" (by Fauna International for which NORAD extended generous support), most of the whole Yala system of protected areas is supposed to be surrounded by a 1-3 km buffer zone. Recent wildlife legislation has recognized the need to extend management outside the boundaries of the parks and reserves. This is in tune with the modern approach to conservation: local people's needs and their participation are integral parts of an holistic management strategy. However, buffer zone management has not yet been started in Yala national park, in spite of the overwhelming needs to do so. The problems of land use immediately adjacent to block IV (and in Handapanagula) are acute. It is recommended that any assistance that NORAD may consider in the future should be linked to this important task of extended protected area management. The forthcoming report from the current GEF/DWLC project will probably outline priorities for activities to be implemented within this field of conservation and sustainable use of natural resources.

Ås, March 1996

Appendices:

1. References
2. Terms of reference
3. People consulted
4. Itinerary

Appendix 1

References:

- Cox, J.A. 1988. Remote sensing and land evaluation for planning elephant corridors in Sri Lanka. ITC Journal 2:172-177.
- DWLC. 1990. National policy for wildlife conservation. Colombo, Sri Lanka.
- Greller, A.M. and Balasubramaniam, S. 1993. Physiognomic, floristic and bioclimatological characterization of the major forest types of Sri Lanka. In: Ecology and landscape management in Sri Lanka, Margraf Sci. Books, Weikersheim
- Jayewardene, H.W. 1993. Yala national park. Fuana Int. Trust, Aitken Spence Printing Ltd., Sri Lanka.
- Karunanayake, M.M., Abhayaratna, M.D.C., Dayaratna, M.H.S., Padmalal, U.K.G.K. and Tantrigama, G. 1995. Natural area conservation in south east dry zone of Sri Lanka. Draft report, UNDP project SRL/89/001.
- Kuruvita W. and Munaweera D.P. 1994. Rapid appraisal of the human-elephant conflict at Handapanagala and recommendations to mitigate the same. Report to DWLC (In Sinhalese with English tables).
- Santiapillai, C. Dissanayake, S.R.B. and Wijeyamohan, S. 1995. Habitat enrichment in blocks III and IV of the Ruhuna national park, Sri Lanka. Gajah 14:32-43.
- Sayer, J. 1991. Buffer zones in rain forests: facts or fantasy. Parks 2:20-24.
- Sukumar, R. 1989. The Asian elephant: ecology and management. Cambridge Univ. Press.
- Wells, M.P. and Brandon, K.E. 1993. Principle and practice of buffer zones and local participation in biodiversity conservation. Ambio 22:157-161.

CONSULTANCY SERVICES OF PROF. PER WEGGE
REVIEW OF YALA BLOCK IV - NORAD SUPPORTED PROJECT
VIS-A-VIS HANDAPANGALA ELEPHANTS

Draft Terms of Reference
(Amended at Meeting of 12.12.95)

1. Review the documents at DWIC and project documents of NORAD Environment Programme Office, field surveys, field visits, discussions and economic analysis.
2. Review the NORAD funded project activities in relation to Yala Block IV and analyse the cost and benefit of the project.
3. Evaluate the project contribution to enhance the existing park resources and their availability and assess the sustainability.
4. Identify the intensity and magnitude through available data in the Wildlife Department and Divisional Secretariats of the Human-Elephant conflict in the area.
5. Study the elephant population in and out of the Yala N.P. Blocks III, IV and V.
6. Evaluate the water, food and space availability for elephants in the Yala Blocks III, IV and V and assess the need for increase of tank capacity.
7. Assess the suitability of the existing Evergreen high forest vegetation in Blocks III and IV with regard to suitability as elephant habitats and indicate the advisability of modifications.
8. Investigate the existence of old elephant corridors Handapangala-Yala and assess the viability of their restoration.
9. Assess the effects of the proposed elephant drive from Handapangala to Yala Blocks III, IV and V.
10. Recommend mitigation activities to be implemented in short, mid and long-term basis for the problem of Human-Elephant conflict in Moneragala.

W.S.Perera
December 13, 1995.

Appendix 3

People consulted:

Mr. C.P. Attanayake, Director DWLC and NPD-GEF, Colombo
 Mr. Samson, Asst. Director DWLC, Yala NP, Kataragama
 Mr. Panwar, Co-Director of NPD-GEF, Colombo
 Mr. Sumathisena, Asst. Ranger, Yala block IV, DWLC
 Mr. D.M. Aberatne, Asst. Ranger, Yala block III, DWLC
 Mr. Wijepala, Wildlife guard, DWLC/Handanagula
 Mr. D.P.L. Perera, Divisional Secretary, Buttala
 Planning officer, DS office, Buttala
 Mr. J.K.M.K. Jayasekara, Divisional Secretary, Wellawaya
 Mr. P. Jayamanne, Divisional Secretary, Moneragala
 Mr. N.K. Jayawickrama, Manager, Protection Div/Pelwatte S.I
 Mr. Bandara, Superintendent of Outgrowers, Pelwatte S.I.
 Mr. Gunadasa, Director IRDP, Moneragala
 Mr. Kulatunga, IRDP Moneragala/DEA Secretary
 Dr. C. Santiapillai, Zoology Department, Peradeniya University
 Dr. N. Gunatilleke, Botany Department, Peradeniya University
 Mr. B. Ranawana, Botany Department, Peradeniya University
 Mr. D.P. Munaweera, Deputy Director, Forestry Planning Unit
 Mr. E.W. Seneviratne, IUCN/Sri Lanka
 Mr. W.M. Leelasena, Senior advisor, NORAD/Sri Lanka
 Mr. W. Dissanayake, farmer and president of local NGO in
 Pahalauwa/Handapanagula: "Society of victims from elephant
 attacks"
 Mr. U.P.T. Silva, chairman of local rural development society,
 Anapallama
 Mr. B.K. Henry, secretary of rural development society,
 Anapallama
 Grama niladaris, Handapanagula (3 persons)
 Several farmers, outgrowers and settlers of local villages at
 Handapanagula, Nelugala, Anapallama and Neluwagala

Appendix 4

Itinerary:

- Day 1 (Monday): Departure from Norway (duty station) at
12.11 07:00 hrs
- Day 2 (Tuesday): Arrival Colombo 10:00. Meeting with MTEWA
12.12 for dicussion and adjustment of TOR
- Day 3 (Wednesday): Attended workshop by GEF/DWLC about
12.13 elephant management. Drove to Moneragala,
arrrrival 20:00 hrs
- Day 4 (Thursday): Meetings Divisional Secretaries in
12.14 Moneragala and Buttala and with IRDP
personnel. Visit to block 4 of Yala NP.
Arrival of additional vehicle from Colombo
during night
- Day 5 (Friday): Meeting with Protection manager of Pelwatte
12.15 Sugar Industries. Interview with villagers
in Handapanagula. Visit with Divisional
Secretary in Wellawaya. Visit to Moneragala
to be joined by additional team member from
IRDP. Inspection of construction works in
block 4.
- Day 6 (Saturday): Interview with asst. manager of Outgrowers
12.16 of Pelwatte S.I., grama niledaris and
villagers in Handapanagula. Visit to block
3, 5 and 2, interview with DWLC staff at
Galge.
- Day 7 (Sunday): Visit to Handapanagula for inspection of
12.17 elephant habitat and potential area of
extension (blocks 3 and 5 of PSI,
Neluwagala village and government forest)
and interview with local DWLC staff.
Meeting with asst. Director of DWLC in
Katagarama.
- Day 8 (Monday): Travel to Colombo with stop-over at
12.18 Peradeniya University for discussions with
professors Santiapillai (zoology) and
Gunatilleke (botany).
- Day 9 (Tuesday): Report preparation and debriefing at MTEWA.
12.19 Meeting with Director of DWLC and Director
of GEF project.
- Day 10 (Wednesday): Departure at 02:00 for Norway, arrival Oslo
12.20 17:00 hrs.