

**PC – II**

**ESTABLISHMENT OF ZOO AT MULTAN**



**1<sup>ST</sup> REVISED**

**WILDLIFE & PARKS DEPARTMENT  
GOVERNMENT OF PUNJAB**

**SEPTEMBER, 2015**

## **REASONS FOR REVISION OF PC-II “ESTABLISHMENT OF ZOO AT MULTAN”**

The PC-II was approved by PDWP in its meeting held on 22.4.2014 at a total cost of Rs.7.700 million with its gestation period starting from 01.5.2014 to 31.10.2014. The selection of consultants could not be finalized during the fiscal year 2014-15 due one reason or another. The selection of consultants has been finalized and proposed cost of the project raised upto Rs.9.904 million. M/s Engineering General Consultants (EGC) (Pvt) Limited, Lahore has been selected as consultants for the establishment of Multan Zoo. The period of PC-II was expired on 31.10.2014 and its cost was also revised, so the PC-II has been revised and extension in its gestation period has been proposed upto 30.6.2016. The cost of project has also been revised from Rs.7.700 m to Rs.9.904 m.

### **2. Financial Allocation**

|  |   |
|--|---|
| ADP Allocation for 2015-16                                   | <b>Rs.6.700 m</b>   |
| Funds will be diverted from adjustment from Wildlife Sector. | <b>Rs.3.204 m</b><br>An amount of Rs.1.850 m from PC-II “Establishment of National Safari Park in Salt Range” and an amount of Rs.1.354 m from PC-II “Public Private Partnership Initiatives for Development of Wildlife in Punjab” |

**PC-II PROFORMA**  
**Government of Pakistan**  
**Proforma for Development Projects**  
**(Survey & Feasibility Studies)**

1. **Name by which survey will be identified.** : Establishment of Zoo at Multan
  
2. **Authorities responsible for**
  - (i) Sponsoring : Government of the Punjab, Forest, Wildlife & Fisheries Department.
  
  - (ii) Execution : Punjab Wildlife & Parks Department.
  
  - (iii) Operation and maintenance : Punjab Wildlife & Parks Department.
  
3. **Central Ministry concerned with**
  - a) Sponsoring
  - b) Execution
  - c) Operation and Maintenance } Not Applicable

4. **Details of survey and feasibility study :**

**a) General Description**

The province of Punjab hold 60% of the population of Pakistan. Lahore, Rawalpindi, Faisalabad, Multan, Gujranwala, Bahawalpur and Sargodha are major cities of Punjab. There are only three Zoos in Punjab at Lahore, Bahawalpur and D.G. Khan. Multan (Madinatul Olya) has importance in southern Punjab for agriculture land, growing specifically Cotton and Mangoes garden. Population of the city is increasing by migration of people from adjoining villages and towns for urbanization facilities i.e. education, health services, business and industrial area development. In such populated city only Cantonment park and Shah Shamas children park are providing some recreational facilities to the public but no site for awareness and amusing with wild animals and birds has been developed. Therefore, the Establishment of Zoo at Multan is need of population of Multan and adjoining towns / villages.

Historically Multan was rich in variety of wildlife when the habitat was existing in riverine area of two rivers Ravi and Chenab used to flow around Multan. During the ancient times the wildlife was in abundance. But due to urbanization, modern development, the wildlife was deflected and became extinct. Wildlife is an integral part of the environment and important natural resource. The Punjab Wildlife & Parks Department being custodian of wildlife in the province is doing utmost efforts for its survival. Punjab province has unique wildlife species such as Black buck, Chinkara, Hog deer, Urial, Blue bull and bird variety in their relevant habitats. On other hand ruthless hunting, environmental degradation, extensive spray of pesticide / insecticides and rapid increase in human population have lead to decrease the wildlife habitat in the province. Some beautiful animals / birds are near to extinct which must have to be saved for the next generation and as a beauty of our land.

In order to save and further propagate the indigenous as well as exotic wildlife species, the Punjab Wildlife & Parks Department is playing its vital role by establishing Zoos, Wildlife Parks and Breeding Centres throughout the province which are source for breeding of the rare local and exotic wildlife species as well as providing the recreation for all walks of life and research facilities to the research workers and students. Establishment of Zoos / Wildlife Parks is a need of the time for conservation of wildlife and enrichment of environment.

The project is included in the Chief Minister's Special District Package for Multan. The land covering area of 58 acres situated in Mouza Baleel Tehsil Multan Sadar, District Multan, 23km from Multan City to Shujabad Road acquired by the City District Government, Multan stands allocated to Punjab Wildlife & Parks Department for **Establishment of Zoo at Multan.**

### **Aims & Objectives**

1. Propagation of indigenous and exotic wildlife species in semi natural settings.
2. Captive breeding of wild animals / birds in an environment friendly manner.
3. Recreational facilities for local population as well as people of adjoining areas.
4. Public motivation / education regarding importance of wildlife in ecosystem.
5. Research opportunities / facilities to the students, research scholars & scientists.
6. Employment opportunities for public.

## Scope of Works --Responsibilities of the Consultant

### A) Planning, Designing and PC-I Document

To develop a workable Master Plan that shall include the following:

- 1) The layout & designs / plans of proposed animal facilities highlighting their proper habitats, barriers types, enclosure size, den placement in a natural settings and a list of the animal species to be displayed.
- 2) The layout & designs / plans of public infrastructures such as car park, entrance plaza, toilets, educational facilities, food and beverage (F&B), retail outlets, tram systems and other utilities etc.
- 3) The layout & designs / plans of reticulation of service roads and footpaths, security systems, electrical and fiber-optic systems, potable and recycled water, drainage, waste water and sewerage lines. Also the sources of electrical power (both conventional and alternate to be considered), potable water (ground water) and sewerage treatment (oxidation, reed beds or septic tanks).
- 4) The Detailed Feasibility Study shall include the following:
  - Topographic survey, contour mapping and preliminary soil investigation.
  - Environmental impact assessment.
  - Economic & financial impact and evaluation / analysis, cost benefit ratio and internal rate of return.
  - Identify legal, institutional and regulatory framework.
  - Assumption and risks.
  - Land use plan, study various international models, best practices and proposed practical viable option.
  - Total area of the Zoo.
  - Area to be developed.
  - Location of infrastructure.
  - Location of bus stops, taxi stands and public parking.
  - Location of animal medical-care center and other management buildings.
  - Location of public toilets.
  - Sites for security posts, view decks and visitors shelters.
  - Location of fire fighting and disaster management systems.
  - Identification and development of interventions / initiatives.
  - Identification of transport facilities for visitors, adjoining communities and stakeholders.
  - Location of public call offices.(public phones)
  - Preparation of PC-I Document alongwith cost estimates & designs of interventions based on the approved Master Plan.
  - Any other activity required for successful completion / commission of project.

## **B) Strategic Business Planning and Feasibility Study**

To develop the following in a strategic capacity in order to develop a realistic Business Plan:

- The recommended corporate structure and organizational structure of the Multan Zoo, reviewing possible ways to be autonomous from Government.
- The recommendations to establish an independent Management Board under overall control of the Wildlife & Parks Department.
- Exploration of possible models for out sourcing the operation of the Zoo through Public Private Partnership or through a Zoo Management Committee on the pattern of Lahore Zoo.
- Strategic recommendations for the Marketing Communications of the project.
- The strategic recommendations for HR management required to maintain the project in professional management.
- To develop a realistic model for the size of the visitor market segments and their respective spending power which will translate into admission pricing and discounting, types and price ranges of F&B and retail.
- Estimate sources of revenue: admission charges, F&B, rides, photography, retail, donations, Government subsidies etc.
- Estimate the capital as well as operating costs of the Multan Zoo.
- Develop a 10-year Profit and Loss projection for Multan Zoo.

## **Justification**

The project initiated on the directions of Chief Minister, Punjab. The District Government, Multan has allocated 58-acres of land to Punjab Wildlife & Parks Department for Establishment of Zoo at Multan.

The District Government, Multan had submitted a PC-I document costing Rs.625.475 million to the Planning & Development Department which was discussed in the PDWP meeting held on 19.2.2014. During the meeting, the Member (ID), Planning & Development Department has pointed out that the designs / drawings of different animal's facilities have neither been vetted by the Chief Architect, Punjab not prepared by any qualified Architect. Thus not fit for implementation as such. The Wildlife & Parks Department explained that the Architect Department was approached for vetting the drawings or prepare the design / master plan of Zoo but they refused on account of non-availability of technical expertise for this job.

Foregoing in view the PDWP decided that the department should develop a PC-II scheme to hire the consultants for the preparation of detailed feasibility study, drawings, designs, cost estimates, master plan and PC-I Document for Multan Zoo. Hence, the PC-II of the project has been prepared accordingly and was approved by PDWP in its meeting held on 22.4.2014 for Rs.7.700 million during fiscal year 2014-15. The process for the selection of consultants could not be finalized during the fiscal year 2014-15. Hence the period of PC-I expired on 30.6.2015. The selection of consultants was finalized in July, 2015 vide minutes of Consultants Selection Committee held on 01.7.2015 issued vide No.SOP(WL)1-2/2014-CSC dated 14.7.2015.

## Reasons for Revision

The PC-II was approved by PDWP in its meeting held on 22.4.2015 for the fiscal year 2014-15 at a total cost of Rs.7.700 million. The selection of consultants could not be finalized during the fiscal year 2014-15 due one reason or another. The selection of consultants has been finalized and cost of the project raised upto Rs.9.904 million. M/s Engineering General Consultants (EGC) (Pvt) Limited, Lahore has been selected for the establishment of Multan Zoo. The PC-II has been revised accordingly.

## Month of Commencement & Completion

- |     |                   |                          |
|-----|-------------------|--------------------------|
| I.  | Commencement date | 01.05.2014 to 30.06.2016 |
| II. | Completion period | 26-months                |

## Schedule of Services to be provided by the Consultants

| Stage | Scope of services  | Timelines    |
|-------|--|--------------|
| 1.    | Detailed feasibility study & master plan in accordance with the T.O.R.s  | 2-Man months |
| 2.    | Preparation of Strategic Business Plan on the basis of feasibility study | 1-Man month  |
| 3.    | Preparation of project proposal / PC-I document with costing             | 1-Man month  |

## Detail of Deliverables

| Stage | Scope of services   |
|-------|---|
| 1.    | Submission of draft detailed feasibility study & master plan in accordance with the TORs        |
| 2.    | Submission of final detailed feasibility study & master plan in accordance with the TORs        |
| 3.    | Submission of draft Strategic Business Plan on the basis of feasibility study                   |
| 4.    | Submission of final Strategic Business Plan on the basis of feasibility study                   |
| 5.    | Submission of project proposal / PC-I document & final presentation to the competent authority. |

## Estimated Cost

**Rs.9.904 million**

(Break-up of cost is attached as Annex-A)

## Personnel Requirements

### a) Professional & Technical

- a) Zoo / Wildlife Park Management Specialist with minimum 10-years experience in natural resource management / forestry, knowledge of issues & challenges related to conservation and management of wildlife resources and natural environment, understanding of sustainable natural resource management models and their implementation.
- b) Bio-diversity Conservation Specialist with minimum 10-years experience in conservation of biodiversity at par with best international practices, natural resource management / forestry, knowledge of issues & challenges related to conservation and management of wildlife resources and natural environment, understanding of sustainable natural resource management models and their implementation.
- c) Architect – Specialist in Zoo / Wildlife Park with minimum 10-years experience preferably in designing of wildlife parks / zoos and animal’s structures in a semi natural environment.
- d) Horticulturist / Habitat Development Specialist with minimum 10-years experience in horticulture, habitat development & enrichment, landscaping and provision of semi natural environment to exhibits close to natural settings and overall landscaping planning and implementation of agreed plan.
- c) Civil Engineer with minimum 10-years experience in civil engineering.
- d) Financial Expert / Economist with minimum 10-years experience in relevant fields relating to development of funding mechanism of projects preferably related to natural resources, experience of developing projects on PPP mode, due diligence of related financial implications & assurance, financial / cost analysis of projects including IRR, BCR, NPV, cash flow etc.
- e) Environmental Expert with minimum 10-years experience relating to conducting Environmental Impact Assessment, knowledge of environmental issues & challenges, identification of environmental risks and remedial measures and mainstreaming the environmental issues in overall project development and implementation mechanism.

### b) Administrative / Executive Managerial

No additional staff is required during PC-II / Feasibility Study. The existing territorial staff will be deputed to co-ordinate with the consultants.

## Period of Contract of Consultants and their Terms of Appointment

- |                         |                       |
|-------------------------|-----------------------|
| a) Period               | Four (04) man-months  |
| b) Terms of appointment | As per enclosed TORs. |



## **Budget Provision**

The project would be financed by the Government of Punjab through Annual Developed Programme. Rs.6.700 million are allocated during current financial year 2015-16.

## **Details of Scheme Likely to be submitted after Survey**

Based on detailed feasibility study and approved Master plan, the consultants would prepare a comprehensive PC-I document duly supported with preliminary drawings, detailed working drawings, rough cost estimates and detailed estimates / BOQs. The PC-I scheme would cover the proposed interventions or as agreed by the competent authority based on the approved Master plan.

**PREPARED BY :**

**(RIAZ AHMAD)**  
ASSISTANT DIRECTOR WILDLIFE (M&E)  
PUNJAB WILDLIFE & PARKS DEPARTMENT  
HEAD OFFICE, LAHORE  
(042-99212369)

**CHECKED BY :**

**(KHALID AYAZ KHAN)**  
DIRECTOR GENERAL  
WILDLIFE & PARKS DEPARTMENT, PUNJAB  
(042-9212367)

**APPROVED BY :**

**(CAPT. (R) JAHANZEB KHAN)**  
SECRETARY  
GOVERNMENT OF THE PUNJAB  
FOREST, WILDLIFE & FISHERIES DEPARTMENT  
(042-9211695)

**BREAK-UP OF COST AND TENTATIVE MAN-MONTHS**

| <b>Sr. No.</b> | <b>Title</b>                                    | <b>Tentative Man-months</b> | <b>Rate per Man-month</b> | <b>Tentative Cost</b> |
|----------------|---|-----------------------------|---------------------------|-----------------------|
| 1.             | Zoo / Wildlife Park Management Specialist       | 4                           | 5,00,000/-                | 20,00,000/-           |
| 2.             | Biodiversity conservation specialist            | 4                           | 5,00,000/-                | 20,00,000/-           |
| 3.             | Architect – Specialist in Zoo / Wildlife Park   | 2                           | 5,00,000/-                | 10,00,000/-           |
| 4.             | Horticulturist / Habitat Development Specialist | 4                           | 5,00,000/-                | 20,00,000/-           |
| 5.             | Civil Engineer                                  | 2                           | 5,00,000/-                | 10,00,000/-           |
| 6.             | Financial expert / economist                    | 1                           | 6,00,000/-                | 6,00,000/-            |
| 7.             | Environmental Expert                            | 1                           | 5,00,000/-                | 5,00,000/-            |
| 8.             | Support staff                                   | 2                           | 4,02,000/-                | 8,04,000/-            |
| <b>Total:</b>  |   |                             |                           | <b>99,04,000/-</b>    |
| <b>Say:</b>    |   |                             |                           | <b>Rs.9.904 m</b>     |

**Note:** These figures are tentative. However, payment to the selected consultants would be made as per agreed rate / fee.

## **VISION STATEMENT**

Develop Multan Zoo compatible to the international standards for the social, economic, scientific, recreational and educational benefits of local communities, scientists and visitors / tourists from any destination or origin.

## INTERVENTIONS

Following interventions / facilities have been proposed for Establishment of Zoo at Multan. The consultants will be at liberty to add or combine any of these interventions.

### **a) ANIMALS / BIRDS FACILITIES**

1. Llama enclosure
2. Mouflon / Urial enclosure
3. Red deer and Fallow deer enclosure
4. Spotted deer and hog deer enclosure
5. Chinkara and Black buck enclosure
6. Blue bull enclosure
7. Ostrich enclosure
8. Cassowary and Addax enclosure
9. Oryx enclosure
10. Camel enclosure
11. Kangaroo enclosure
12. Zebra and Giraffe enclosure
13. Rhinoceros enclosure
14. Hippopotamus enclosure
15. Leopard enclosure
16. Tiger enclosure
17. Lion enclosure
18. Bear house / moat
19. Monkey and Chimpanzee house / island
20. Elephant house
21. Bird cages / bird section
22. Crocodile pond
23. Bird Aviary
24. Aquarium building
25. Reptile Section
26. Main entrance with allied facilities
27. Boundary wall / fencing portion of the area

**b) PUBLIC FACILITIES**

1. Information centre
2. Public toilets
3. Car parking
4. Gazebo with benches
5. Restaurant / Kiosks
6. Toys / souvenir shop
7. Mosque
8. Visitors shelters
9. Roads / tuff paver path

**e) OTHER FACILITIES**

1. Turbines and overhead reservoir with supply system
2. Sewerage system / septic tank
3. Fountains / water sports
4. Street lights / Garden lights
5. Water hydrants
6. Development of lawns, afforestation, landscaping etc.
7. Electric transformer and laying of main supply line underground to buildings, enclosures, cages.
8. Office buildings i/c Lab, Vet clinic / laboratory, operation theatre & quarantine area etc.
9. Residential block for officers / officials
10. Transport / vehicles
11. CCTV System
12. Wireless system
13. Intercom system
14. Machinery, tools and equipments
15. Purchase of animals / birds
16. Contingencies
17. Establishment / proposed management structure
18. Any other facility which deemed fit for successful completion / commencing of the project.

**TERMS OF REFERENCE FOR CONDUCTING DETAILED FEASIBILITY STUDY INCLUDING MASTER PLANNING & PC-I DOCUMENT**

**Background**

In order to save and further propagate the indigenous threatened wildlife species, the Punjab Wildlife and Parks Department is actively playing its role by establishing Zoos, Wildlife Parks, Safaris and Breeding Centers throughout the province. Wildlife Parks, Breeding Centres and Zoos are source for breeding of the rare local and exotic wildlife species as well as providing the recreation for all walks of life and research facilities to the research workers and students.

For this purpose the Punjab Wildlife and Parks Department has planned for Establishment of Zoo at Multan in association with City District Government. The Chief Minister Punjab has already allocated funds for the project during current fiscal year 2013-14 under Chief Minister’s Special Package for Southern Punjab. A piece of land covering an area of 58 acres, situated in Mouza Baleel Tehsil Multan Sadar, Multan City to Shujabad Road has been allocated by the City District Government to execute the project.

The consultants shall work under the administrative control of Punjab Wildlife & Parks Department. The idea is to develop Multan Zoo compatible to the International standards and settings close to natural environment that incorporates conservation / breeding oriented approach together with recreation, education and research, while maintaining / improving the natural ecology of the area.

The consultants while designing / planning the project proposal and master plan shall focus on the propagation of indigenous and exotic wildlife species in semi natural settings, captive breeding of wild animals / birds in an environment friendly manner, recreational facilities for local population as well as people of adjoining areas, public motivation / education regarding importance of wildlife in ecosystem and research opportunities / facilities to the students, research scholars & scientists.

**Aims & Objectives**

- Detailed feasibility study & master plan in accordance with the T.O.R.s
- Preparation of Strategic Business Plan on the basis of feasibility study
- Preparation of project proposal / PC-I document with costing

## Scope of Works -- Responsibilities of the Consultant

### A) Planning, Designing and PC-I Document

To develop a workable Master Plan that shall include the following:

- 1) The layout & designs / plans of proposed animal facilities highlighting their proper habitats, barriers types, enclosure size, den placement in a natural settings and a list of the animal species to be displayed.
- 2) The layout & designs / plans of public infrastructures such as car park, entrance plaza, toilets, educational facilities, food and beverage (F&B), retail outlets, tram systems and other utilities etc.
- 3) The layout & designs / plans of reticulation of service roads and footpaths, security systems, electrical and fiber-optic systems, potable and recycled water, drainage, waste water and sewerage lines. Also the sources of electrical power (both conventional and alternate to be considered), potable water (ground water) and sewerage treatment (oxidation, reed beds or septic tanks).
- 4) The Detailed Feasibility Study shall include the following:
  - Topographic survey, contour mapping and preliminary soil investigation.
  - Environmental impact assessment.
  - Economic & financial impact and evaluation / analysis, cost benefit ratio and internal rate of return.
  - Identify legal, institutional and regulatory framework.
  - Assumption and risks.
  - Land use plan, study various international models, best practices and proposed practical viable option.
  - Total area of the Zoo.
  - Area to be developed.
  - Location of infrastructure.
  - Location of bus stops, taxi stands and public parking.
  - Location of animal medical-care center and other management buildings
  - Location of public toilets.
  - Sites for security posts, view decks and visitors shelters.
  - Location of fire fighting and disaster management systems.
  - Identification and development of interventions / initiatives.
  - Identification of transport facilities for visitors, adjoining communities and stakeholders.
  - Location of public call offices.(public phones)
  - Preparation of PC-I Document alongwith cost estimates & designs of interventions based on the approved Master Plan.
  - Any other activity required for successful completion / commission of project.

## B) Strategic Business Planning and Feasibility Study

To develop the following in a strategic capacity in order to develop a realistic Business Plan:

- The recommended corporate structure and organizational structure of the Multan Zoo, reviewing possible ways to be autonomous from Government.
- The recommendations to establish an independent Management Board under overall control of the Wildlife & Parks Department.
- Exploration of possible models for out sourcing the operation of the Zoo through Public Private Partnership or through a Zoo Management Committee on the pattern of Lahore Zoo.
- Strategic recommendations for the Marketing Communications of the project.
- The strategic recommendations for HR management required to maintain the project in professional management.
- To develop a realistic model for the size of the visitor market segments and their respective spending power which will translate into admission pricing and discounting, types and price ranges of F&B and retail.
- Estimate sources of revenue: admission charges, F&B, rides, photography, retail, donations, Government subsidies etc.
- Estimate the capital as well as operating costs of the Multan Zoo.
- Develop a 10-year Profit and Loss projection for Multan Zoo.

The client will have the right to increase or decrease the scope of work.

### SCHEDULE OF SERVICES TO BE PROVIDED BY THE CONSULTANTS

| Stage | Scope of services  | Timelines    |
|-------|--|--------------|
| 1.    | Detailed feasibility study & master plan in accordance with the T.O.R.s  | 2-Man months |
| 2.    | Preparation of Strategic Business Plan on the basis of feasibility study | 1-Man month  |
| 3.    | Preparation of project proposal / PC-I document with costing             | 1-Man month  |

### DETAIL OF DELIVERABLES

| Stage | Scope of services  |
|-------|--|
| 1.    | Submission of draft detailed feasibility study & master plan in accordance with the TORs                 |
| 2.    | Submission of final detailed feasibility study & master plan in accordance with the TORs                 |
| 3.    | Submission of draft Strategic Business Plan on the basis of feasibility study                            |
| 4.    | Submission of final Strategic Business Plan on the basis of feasibility study                            |
| 5.    | Submission of project proposal document / PC-I document & final presentation to the competent authority. |



## **TIME LINES**

- Four months from signing of the agreement.

## **PAYMENT**

Punjab Wildlife & Parks Department will pay the consultants on agreed rate following the submission of requisite documents / reports and completion of deliverables. The rate will be agreed upon with the consultants prior to signing of the contract.

## **PERSONNEL REQUIREMENTS**

The consultant(s) for feasibility study, master planning, strategic business plan and project proposal / PC-I document shall possess the following experience and skills.

- a) Zoo / Wildlife Park Management Specialist with minimum 10-years experience in natural resource management / forestry, knowledge of issues & challenges related to conservation and management of wildlife resources and natural environment, understanding of sustainable natural resource management models and their implementation.
- b) Bio-diversity Conservation Specialist with minimum 10-years experience in conservation of biodiversity at par with best international practices, natural resource management / forestry, knowledge of issues & challenges related to conservation and management of wildlife resources and natural environment, understanding of sustainable natural resource management models and their implementation.
- c) Architect – Specialist in Zoo / Wildlife Park with minimum 10-years experience preferably in designing of wildlife parks / zoos and animal’s structures in a semi natural environment.
- d) Horticulturist / Habitat Development Specialist with minimum 10-years experience in horticulture, habitat development & enrichment, landscaping and provision of semi natural environment to exhibits close to natural settings and overall landscaping planning and implementation of agreed plan.
- c) Civil Engineer with minimum 10-years experience in civil engineering.
- d) Financial Expert / Economist with minimum 10-years experience in relevant fields relating to development of funding mechanism of projects preferably related to natural resources, experience of developing projects on PPP mode, due diligence of related financial implications & assurance, financial / cost analysis of projects including IRR, BCR, NPV, cash flow etc.
- e) Environmental Expert with minimum 10-years experience relating to conducting Environmental Impact Assessment, knowledge of environmental issues & challenges, identification of environmental risks and remedial measures and mainstreaming the environmental issues in overall project development and implementation mechanism.

••• ••• ••• •••