

The original estimated cost of the National Aluminium Company project was Rs. 1242.4 crores at first quarter 1980 price level. The revised cost estimate at the first quarter 1985 price level is Rs. 2408.14 crores, mainly due to the following reasons :—

- (i) Inflation,
- (ii) Financial charges,
- (iii) Scope changes,
- (iv) Quantity variations,
- (v) Taxes and duties.

(d) The cumulative expenditure on the project upto March 1986 was 1777.5 crores. A provision of Rs. 380.4 crores has been made during 1986-87. The balance amount of about Rs. 250 crores will also be provided by the Government after 1986-87.

**Acquiring transformers for Bangalore Doordarshan**

\*838. SHRI V. S. KRISHNA IYER : Will the Minister of INFORMATION AND BROADCASTING be pleased to state :

(a) whether the Bangalore Doordarshan Kendra has been using transformers to relay its programmes when there is a power failure ; and

(b) if not, whether Government propose to acquire transformers for the purpose ?

**THE MINISTER OF STATE OF THE MINISTRY OF INFORMATION AND BROADCASTING (SHRI V.N. GADGIL) :**

(a) and (b). It is presumed that the Hon'ble Member has referred to the use of diesel generator at Doordarshan Kendra, Bangalore as a stand by arrangement in the event of failure of main power supply. A diesel generator is available in the premises where the interim studio centre is located at Bangalore. Initially, the 1 KW TV transmitter of Doordarshan Kendra, Bangalore was also located in the same premises. However, consequent upon the power of the transmitter being augmented to 10 KW, the transmitter was shifted in March, 1985

to the permanent TV complex in Bangalore. A temporary power supply connection has been provided at the new location which is envisaged to be replaced by permanent power supply connection with duplicate feeders, to minimise interruptions in service due to power supply failures. The composite studio-transmitter complex, for which the load requirements are high, was planned on the basis of interruption-free power supply being available from the State Electricity Board. However, in view of the experience, it has been decided to provide a diesel generator at the new site also, as a stand by source of power for the transmitter.

[Translation]

**Increase in cost of construction of houses in Delhi**

\*839. SHRI BALWANT SINGH  
RAMOOWALIA :  
SHRI KRISHNA SINGH :

Will the Minister of URBAN DEVELOPMENT be pleased to state :

(a) the extent of increase in the cost of construction of houses in Delhi during the period from 1980 to 1985 ;

(b) whether the cost of construction has risen in other metropolitan cities also;

(c) whether some research has been conducted to reduce the cost of construction ; and

(d) if so, the details thereof ?

**THE MINISTER OF URBAN DEVELOPMENT (SHRI ABDUL GHAFOOR) :**

(a) The study conducted by National Buildings Organisation shows that there was an average increase of 16 per cent per annum in construction cost in respect of residential building in Delhi during the period 1980-85.

(b) Yes, Sir.

(c) Yes, Sir.

(d) The National Research Laboratories like the Central Building Research Institute and Structural Engineering Research Centre and other Research organisations have evolved new construction techniques, the details of which are contained in the statement given below.

### Statement

#### *Details of new Construction Techniques and Design Concepts Evolved by Research Institutions*

#### 1. Central Building Research Institute (CBRI), Roorkee.

- (i) Under-reamed pile foundation.
- (ii) Brick-on-edge cavity walls.
- (iii) Single thickness load bearing brick walls for 4 and 5 storeyed buildings.
- (iv) Improved method of brick laying and plastering.
- (v) Polythylene damp-proof course.
- (vi) Stone block masonry
- (vii) Light weight aggregate concrete blocks for partitions.
- (viii) Precast RC channel unit for roofing/flooring.
- (ix) Precast RC cored units for roofing/flooring.
- (x) Precast RC cellular units for roofing/flooring.
- (xi) Precast RC waffle units for roofing/flooring.
- (xii) Doubly curved tiles roofing system.
- (xiii) Precast RC solid planks for roofing/flooring
- (xiv) Precast R.C.L. panel roofing system.
- (xv) Precast reinforced brick panels for walls and roofing/flooring.
- (xvi) Particle board for door shutters.

- (xvii) Precast RCC frames for doors and windows.
  - (xviii) Magnesium oxy-chloride doors frame
  - (xix) Magnesium oxy-chloride tiles for flooring.
  - (xx) Stabilised soil cement base for cement concrete floor.
  - (xxi) Partial replacement of cement by flash in mortar and concrete.
  - (xxii) Single stack system of plumbing.
  - (xxiii) Precast thin lintels.
  - (xxiv) Water proofing in roof with lime concrete terracing.
  - (xxv) Tamping machine for tamping lime concrete on roof.
  - (xxvi) Surface water proofing of mud walls.
  - (xxvii) Corrugated roofing sheets from coir waste.
  - (xxviii) Fire retardant treatment of thatch.
  - (xxix) Improved clay roofing tiles.
  - (xxx) Improved design of brick kiln and lime kiln.
- #### 2. Structural Engineering Research Centre (SERC) Madras :
- (i) Hyperbolic paraboloid footings.
  - (ii) Precast RC waffle unit for roofing/flooring.
  - (iii) Prestressed concrete hyperboloid shell for roofing.
  - (iv) Precast doubly curved shells for roofing/flooring.
  - (v) Hyperbolic paraboloid shell roof.
  - (vi) Brick shell roof with flat bricks.
  - (vii) Lime-Flyash cellular slab for roofing.
  - (viii) Use of high strength deformed bars and ultimate design procedures.
  - (ix) Use of flyash in mortars and concrete.

- (x) Use of flyash in precast prestressed concrete products.
- (xi) Ferro-cement concrete water tank.
- (xii) Ferro-cement concrete silos, bins, etc. for grain storage.
- (xiii) Precast slab, using hollow clay blocks for floors roofs.
- (xiv) Precast RC joists and hollow clay block system.
- (xv) Precast channel units.
- (xvi) On site large panel prefabrication.
- (xvii) Precast two-way spanning flooring/roofing scheme.
- (xviii) Electrothermal prestressing.
- (xix) Prestressed concrete railway sleepers.
- (xx) Fibre reinforced concrete manhold covers.
- (xxi) Prestressed concrete poles.
- (xxii) Latro blocks (Building blocks from latrite soil).

**3. Cement Research Institute, Delhi :**

- (i) Use of flyash in concrete
- (ii) Use of flyash in concrete.
- (iii) Production of ready-mixed concrete.
- (iv) Production of strength mix design of concrete.
- (v) Cement soil stabilised blocks.
- (vi) Precast roofing tiles for low cost housing.
- (vii) Portland pozzolana cement.
- (viii) Prevention of chemical attack on reinforced concrete structures.

**4. Central Road Research Institute, Delhi :**

- (i) Reactive Surkhi;
- (ii) Waterproof mud plaster on mud walls.
- (iii) Flyash as partial replacement of fine aggregate in cement concrete.

- (iv) Lime/burnt clay pozzolana.
- (v) Direct field adjustment chart for control on concrete quality.
- (vi) Bituminous materials in the water proofing of mud walls.

**5. Electro-Chemical Research Institute, Karaikudi, Tamil Nadu.**

- (i) Prevention of corrosion of reinforcement in brick work.
- (ii) Prevention of corrosion of steel reinforcement cement concrete.
- (iii) Prevention of corrosion of steel reinforcement in flyash cement concrete.
- (iv) Corrosion in buildings-level of corrosibility in different regions of India.

**6. Forest Research Institute, Dehra Dun :**

- (i) Secondary species of Timber.
- (ii) Small and medium span nail jointed timber trusses.
- (iii) Utilization of short length small dimension timbers for construction purposes.
- (iv) Termite proofing of buildings and houses.
- (v) Fire [retarding and preservative treatment of thatch roof.
- (vi) Preservative treatment of Bamboos.

**7. Indian Plywood Industries Institute, Bangalore :**

- (i) Veneers plywood shingles for roofing.
- (ii) Exterior grade plywood for roofing and walling.
- (iii) Hard-board for exterior applications.
- (iv) Glued wood-plywood structural

components like beams and structural components.

- (v) Glued laminated doors and window frames and other glued laminated products using structural synthetic resin-adhesive.

**8. Regional Research Laboratory, Jorhat :**

- (i) Cement bonded fibre roofing sheets.
- (ii) Rice-husk flyash pozzolana.
- (iii) Paddy husk bricks.
- (iv) Paper corrugated roofing sheets.
- (v) Flooring tiles from A.C. waste.
- (vi) Bamboocrete for wall panel and roof.
- (vii) Water filter candle for obtaining drinking water.
- (viii) Cheap sanitary septic tanks from waste bitumen drums.

**9. School of Research and Training in Earthquake Engineering Roorkee.**

- (i) Single brick thick load bearing walls for 4 storeyed residential buildings.
- (ii) Single brick thick load bearing walls for 5 storeyed residential buildings.
- (iii) Half brick thick 'Z' shaped load bearing walls.
- (iv) Seismic design of precast RC systems for roofing/flooring.

**10. Hindustan Prefab Ltd., Delhi :**

- (i) Partial pre-fabricated framed structure with RC columns and beams.
- (ii) Pocket connections for precast columns with foundation.
- (iii) Load bearing concrete panels for walls.

- (iv) Hollow cinder block masonry.

- (v) Lime sand flyash hollow block masonry.

- (vi) Precast battens and hollow blocks for roofs and floors.

- (vii) Precast RC cored roofing/flooring system.

- (viii) Prestressed cement concrete beams.

- (ix) Prestressed concrete hollow cored slab resting in prestressed concrete beams for roofing and flooring.

- (x) Precast RC single flight staircase monolithically cast with landing.

- (xi) Prestressed concrete frames for doors and windows.

- (xii) Modified horizontal and vertical joints between concrete wall panels.

- (xiii) Full panel prefab method of construction.

- (xiv) Channel slab for roofing in residential and industrial buildings.

**11. Indian Standard Institution, Delhi**

- (i) National Buildings Code.
- (ii) Standards for low-income Group Housing.
- (iii) Modular Coordination in Buildings.
- (iv) Standard building specifications and codes.
- (v) Standard method of measurements.
- (vi) Standard output norms for materials.

**12. U. P. PWD Research Institute, Lucknow :**

- (i) Strength of brick masonry and mortars.
- (ii) Waterproofing of flat roofs.
- (iii) Replacement of cement by surkhi.
- (iv) Damp proof construction of walls.

- 13. Planning Action and Research Institute, Lucknow :**
- (i) Investigations of comparative efficiency of different types of chullahs and evolving design of smokeless chullahs.
- 14. Sri Ram Institute of Industrial Research, Delhi :**
- (i) Production of clay pozzolana by fluidized method.
  - (ii) Production of gypsum plaster by fluidized method.
- 15. Building and Road Research Laboratory, Chandigarh :**
- (i) Bitumen stabilised soil bricks.
- 16. Central Fuel Research Institute Geologora :**
- (i) Flyash bricks
- 17. Central Mechanical Engineering Research Institute, Durgapur :**
- (i) Development of simple brick making machine.
  - (ii) Economized steel structure of open web sections.
  - (iii) Design development for castellated beams.
- 18. National Environmental Engineering Research Institute, Nagpur :**
- (i) Sanitary Rural latrines.
  - (ii) Garbage chutes in multi-storeyed buildings.
- 19. College of Military Engineering (CME), Pune :**
- (i) Precast roofing flooring units such as cored units channel units, waffle shells and hyperboloid shells.
  - (ii) Damp proof course in cement mortar (1:4) with air entraining agent.
- 20. Regional Engineering College, Warangal:**
- (i) Composite joists filler blocks for roof floors.
  - (ii) Ribbed slab floor/roof (large units).
  - (iii) Ribbed slab floor/roof (small units)
- 21. Bengal Engineering college, Howrah (West Bengal) :**
- (i) Precast RC columns with bracket erected and fixed in recesses of RCC footings laid in situ.
  - (ii) Precast and prestressed beams resting on brackets of the columns.
  - (iii) Composite precast RC battens and hollow cinder blocks for flooring.
  - (iv) Precast and prestressed folded plate roof.
  - (v) Hollow cinder blocks masonry.
- 22. Maharashtra Engineering Research Institute, Nasik :**
- (i) Use of Surkhi in cement mortar as an inert.
  - (ii) Durability of pozzolana mortars and concrete.
  - (iii) Unburnt building bricks.
- 23. I.I.T. Madras :**
- (i) RC Portal frames construction.
  - (ii) Clay Products for roofing,
  - (iii) Composite slab with RCC joists and brick in fill for floors roofs.
  - (iv) Hollow grid slabs for roof/floors.
  - (v) Brick infilled RCC beams.
  - (vi) Simple hand operate hollow block making machine.
  - (vii) Shell foundations.
- 24. I.I.T. Kanpur :**
- (i) Cement from rice-husk.
- 25. Neyveli Lignite Corporation, Neyveli.**
- (i) Flyash lime gypsum brick for masonry.

**26. National Buildings Organisation, Delhi :**

- (i) Modular concept in planning and design of buildings.
- (ii) Clay pozzolana for mortars.
- (iii) Dry-hydrated lime for mortars and concrete.
- (iv) Cellular concrete building products.
- (v) High strength bricks and structural clay products.
- (vi) Asphaltic roofing, sheets.
- (vii) Ridbed floors/roofs of concrete.
- (viii) Load bearing 19 cm thick brick walls.
- (ix) PVC pipes.
- (x) Plastic stays for steel windows.
- (xi) Hudson brick making machine.
- (xii) Sundried bricks and non-erodable water proof mud plaster.
- (xiii) Fire retardant treatment of thatch.
- (xiv) Preservative treatment of bamboos.
- (xv) Reed boards for roof and walling.
- (xvi) Bamboos reinforced concrete for roofing.
- (xvii) Lower ceiling height.

[English]

**Catalogue of rice varieties**

**\*840. DR. T. KALPANA DEVI :  
DR. G. VIJAYA RAMA RAO :**

Will the Minister of AGRICULTURE be pleased to state :

(a) whether during the last 10 years a large number of rice varieties have been released by the Indian Council of Agricultural Research and Agricultural Universities to suit various needs and for improving productivity;

(b) whether a catalogue containing characteristic features of these varieties has

been brought out for ready reference for the use of field staff for transfer of technology and if so, the details thereof;

(c) whether there is any feed back on these varieties about their performance in the field and acceptance by farmers; and

(d) how do the varieties released by the Indian Council of Agricultural Research compare with IR-8 imported from IRRI, Manila ?

**THE MINISTER OF AGRICULTURE (S. BUTA SINGH) :** (a) Yes, Sir. During the last 10 years, over 180 high yielding varieties of rice have been released by Indian Council of Agricultural Research and Agricultural Universities to suit various situations and for improving productivity.

(b) Yes, Sir. A booklet on High Yielding Varieties of rice and their area of adaptability was brought out by Project Director (Rice), Hyderabad in 1978. The up-dated catalogue of released varieties containing their area of adaptability along with their characteristic features, is under preparation.

(c) Feed back on the performance of released varieties is provided by production oriented surveys by State Departments of Agriculture, Kisan Melas organised by Agricultural Universities and Lab to Land programme of the Indian Council of Agricultural Research.

(d) Varieties developed through All India Coordinated Rice Improvement Programme not only favourably compare with IR-8 in respect of yield, but some are even better in performance and quite tolerant to major insect pests, diseases and abiotic stresses. IR-8 has been used for incorporation of dwarfing genes into the tall local rice cultures for prevention of lodging and for increased fertiliser response.

**Criteria for including news in  
National Programme**

**\*841. SHRI JAI PRAKASH AGARWAL :** Will the Minister of INFORMATION AND BROADCASTING be pleased to state :