27th November – 4th December 2013 Sri Lanka

Mahaweli Development Programme

For Needs of the Country

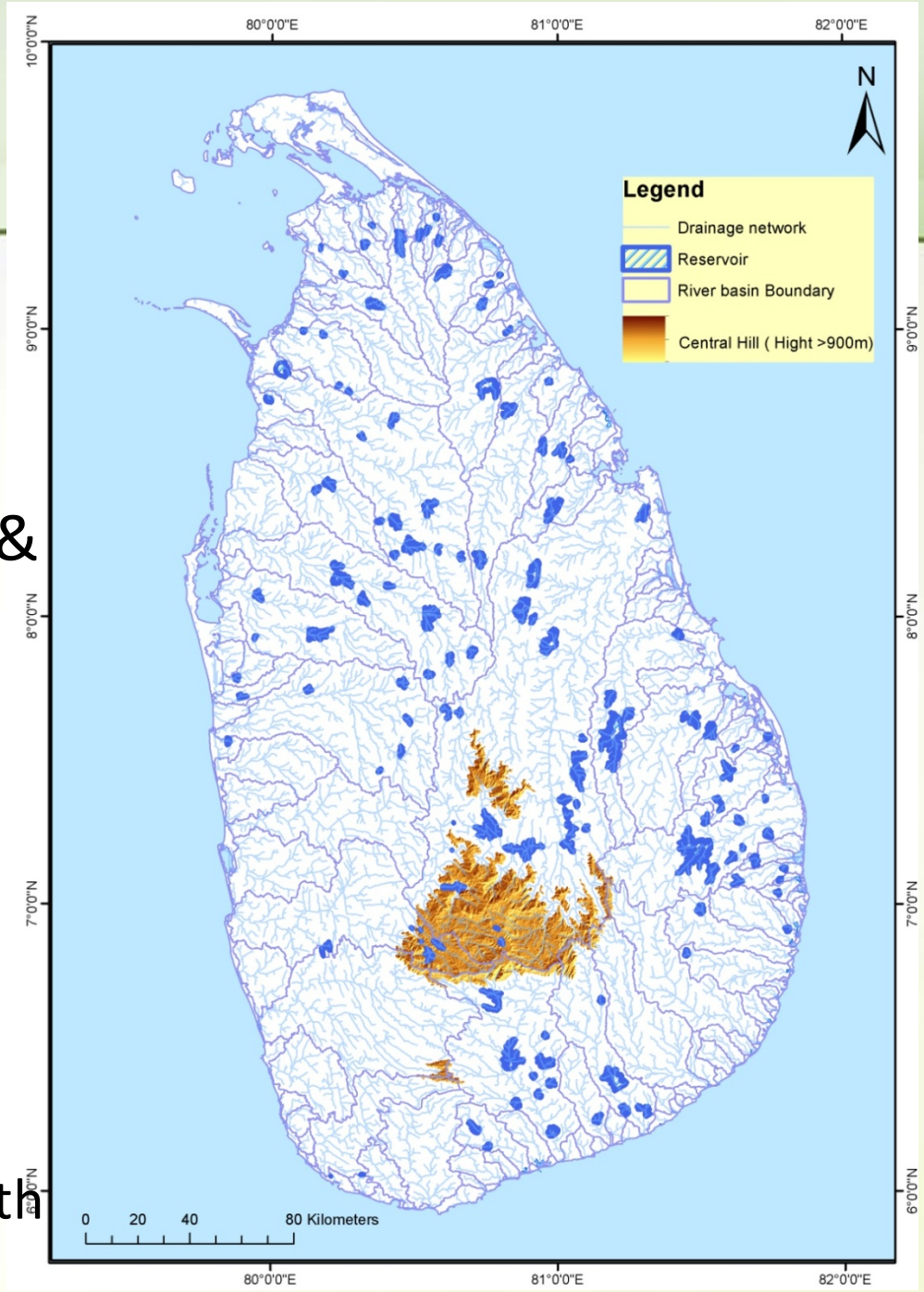
Eng (Mrs) P Talagala
Mahaweli Authority of Sri Lanka
2013.11.28

NARBO
Network of Asian River Basin Organizations

Sri Lanka

Rlevant features

- Land area- 65,000 sq km
- Population – 11.8 million (in 1966)
- South Central parts- hills & mountains(2500 m asl)
- Two monsoons
  - South- West (May to September)
  - North- East (December to February)
  - Annual average rainfall varies from 40- 200 inches in at certain places on south west slopes of the hills



Sri Lanka - relevant features

Climatic zones

- Dry zone

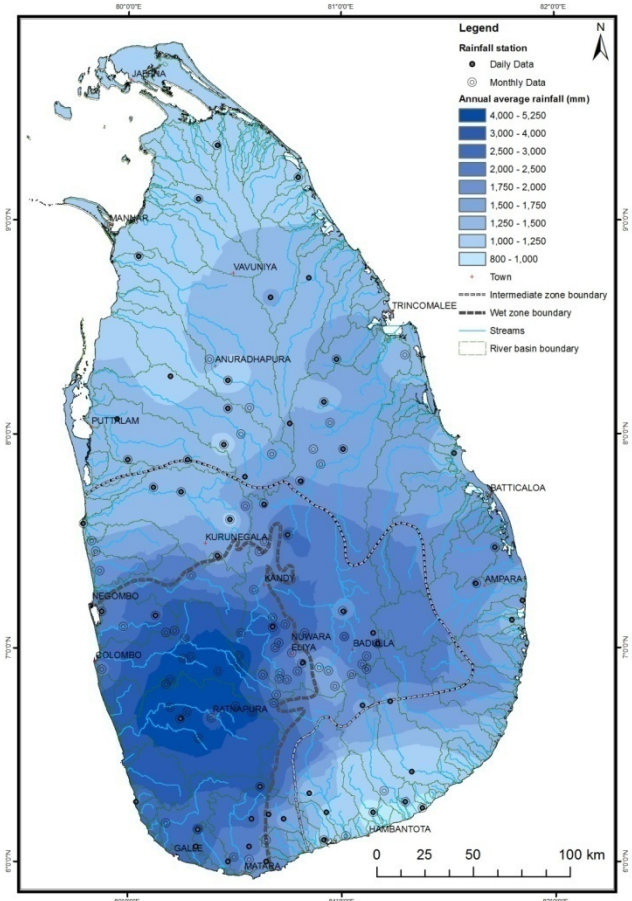
  - 60% of the rainfall is in wet season

- Wet zone (by 75 inch isohyets)

  - covers 30% of the land area

  - 75% of the total population

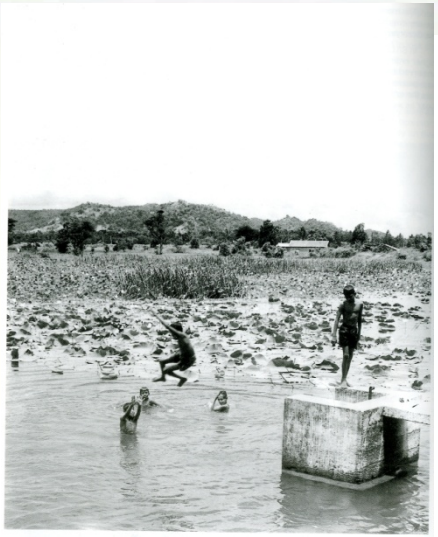
  - Density: 450 persons per sq km (1966)

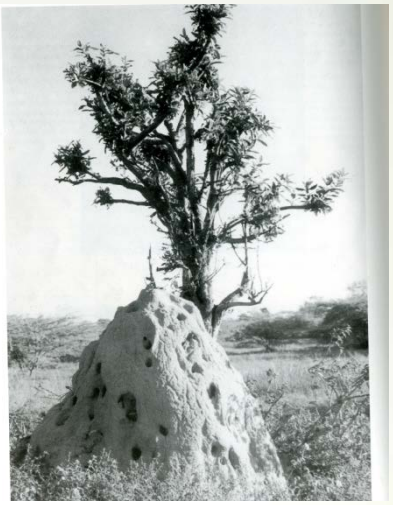


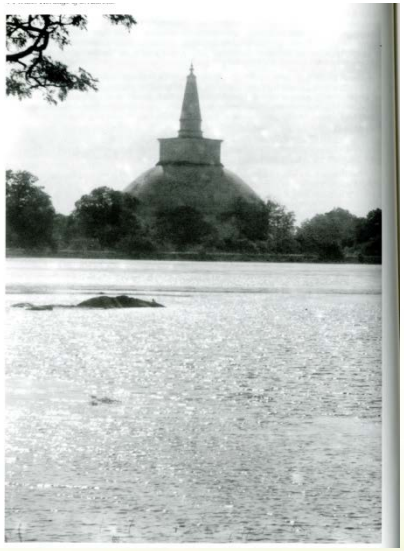
NARBO
Network of Asian River Basin Organizations

Increase/Decrease Population in Dry zone

- The first settlement established in dry zone around 5th century B.C.
- Civilization based on rice cultivation.
- Was the most populous part
- Dry zone agriculturally developed by Tank system in small catchments
- Still in use & active for more than 2000 years







NARBO
Network of Asian River Basin Organizations

Cont.

- In around 12 th century, invasions and internal conflicts resulted in migration to wet zone
- The population in wet zone increased. dry zone was abandoned
- After British occupation in 1815, export oriented commercial plantation system of agriculture was developed in wet zone

- Rapid increase in population in wet zone increased the pressure on land.
- Dry zone was largely empty
- Food production, mainly rice was insufficient and was dependent on imports.

Above reasons led the Govt. taking action to reclaim the dry zone for irrigated agriculture and shifting population to the dry zone.

NARBO
Network of Asian River Basin Organizations

Land settlement in Dry zone (1930- 1970)

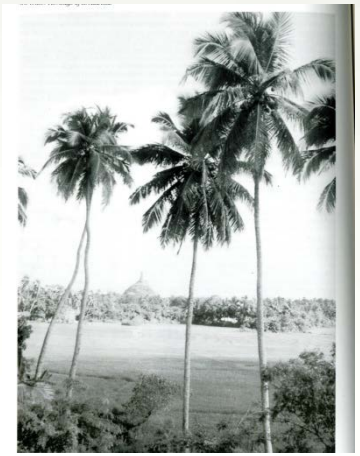
- A program by the Government to encourage settlement for agricultural purposes in unpopulated areas to increase food production

- People from the populated areas were settled in dry zone for agriculture

NARBO
Network of Asian River Basin Organizations

Cont.

- Created new opportunities & better living standards
- Economic position of Settled farmer was better than an average older village farmer in wet zone
- Therefore, establishing settlements in dry zone was an attractive theme for Politicians.
- But limited resources in dry zone hindered the full potential for development



NARBO
Network of Asian River Basin Organizations

Major Irrigation Settlement Schemes (1930 – 1970)

Scheme	Scheme
Parakkrama Samudraya	Mahavilachchiya
Minipe LB	Nachchaduwa
Kagama	Usgala Siyabangamuwa
UnnichchaiIranamadu	Kandalama
Rajangana	Giritale
Gal Oya	Kaudulla
Allai	Kantalai
Padaviya	Walawe
Minneriya	
Hakwatuna Oya	

NARBO
Network of Asian River Basin Organizations

Issues related to early development in Dry Zone

- Large variation in rainfall pattern
- Inflow in to tanks were not sufficient for full cropping in Yala.
- Sometime full cropping of Maha also was difficult
- Mostly some areas were not cultivated in Yala due to the scarcity of water

NARBO
Network of Asian River Basin Organizations

Cont.

- Other Field crops were not popular due to high labour needs and difficulties in marketing
- Paddy yield not improved to a significant level over the years

Government Planning - 1960's

- Government realized that further development of dry zone was impossible without an assured water supply to increase irrigation areas to feed the increasing population and reduce import of rice
- It had also been realized that agriculture based development is to be pursued as the land and water resources are abundant.
- Hence attention was focused on development of water resources of Mahaweli Ganga for Agricultural and Hydropower development

Economic Situation - 1966

- **Employment**

  Population (15 -65 years): 6.8 Million

  Growth rate: 2.5% per annum

  Employment rates (1960-1966)

  1960- 35%

  1963- 30%

  1966- 28%

Rapid growth of population & very high unemployment was observed

Cont.

Employment in Sectors

- Agricultural sector – 51%
- Industry – 10%
- Trade – 9%
- Construction- 3%
- Transport & Communication – 3%
- Services & other activities – 24%

In 1966, 13% of the total labour force was unemployed (4% of the total population)

NARBO
Network of Asian River Basin Organizations

Capital Investment
(1961-1967)

- Agricultural sector
  - 21% to 29%
- Power sector
  - 12% to 17%
- Investments were not sufficient for the growth rate

NARBO
Network of Asian River Basin Organizations

Imports

in million rupees

	1960	1961	1962	1963	1964	1965	1966
Rice	242	217	195	192	326	144	367
Flour	65	69	71	60	137	98	113
Sugar	65	77	56	70	185	71	103

NARBO
Network of Asian River Basin Organizations

Cont.

- Rice imports - around 13.4% of total imports
- Had a substantial impact on balance of trade
- The total consumption of rice - around 1.1 million tons
- Only 0.6 million tons were produced in the Country

NARBO
Network of Asian River Basin Organizations

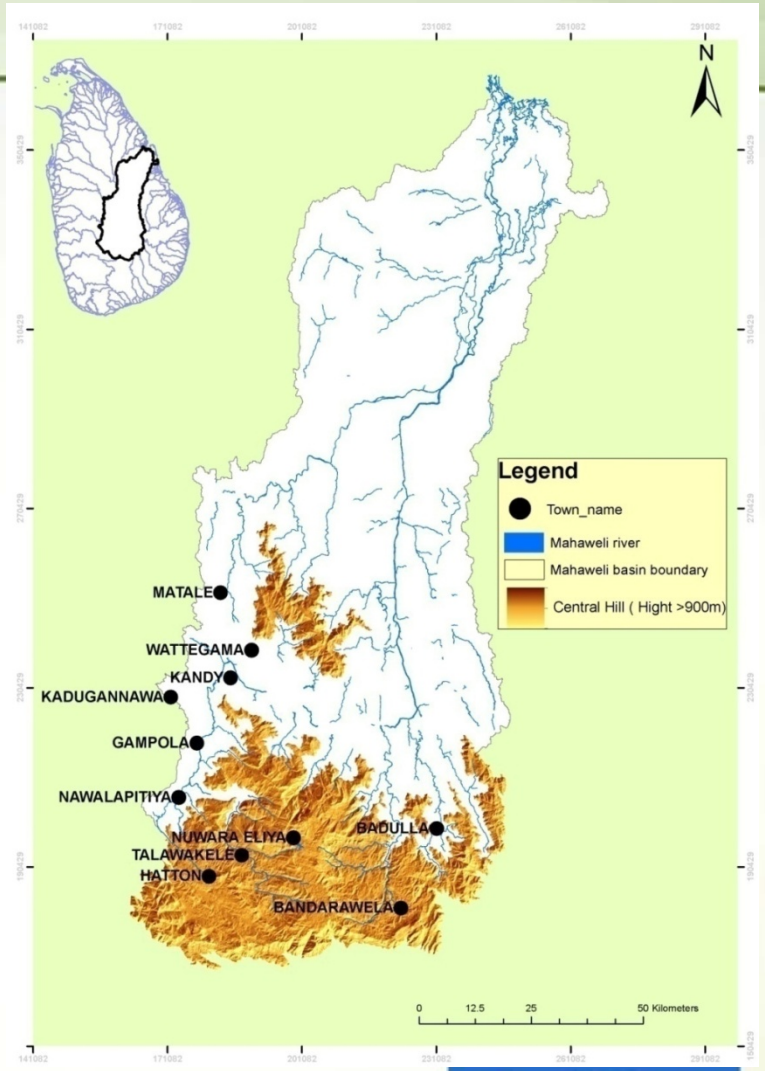
The Need for Mahaweli Ganga Development

- To increase local agricultural production to satisfy the needs of the Population growth (2.5% per annum).
- To reduce imports of agricultural goods
- improve the economic conditions
- Development of irrigation and hydropower will ensure the growth of agriculture and industry
- Reduce unemployment
- Improve food security through local production

NARBO
Network of Asian River Basin Organizations

Water Resources Development in Mahaweli Basin

The Mahaweli Ganga flows through the dry zone to the sea at Trincomalee.



NARBO
Network of Asian River Basin Organizations

Mahaweli Development Project

Survey of Resources - 1954

- **Canadian Hunting Survey Corporation**

  The inventory of resources of the Mahaweli Ganga basin describe the:

  - Geology
  - Landforms
  - Soils
  - Land Use
  - Forest cover
  - Hydrology and the status of the development in the basin at that time

Survey of Resources - 1954

- Reveal a favorable situation for irrigated agriculture in the lower basin
- Cascade of regulatory reservoirs in upper basin.
- Tentative plan of Irrigation & Hydro power development

NARBO
Network of Asian River Basin Organizations

United States Operations Mission (USOM)- 1958 to 1961

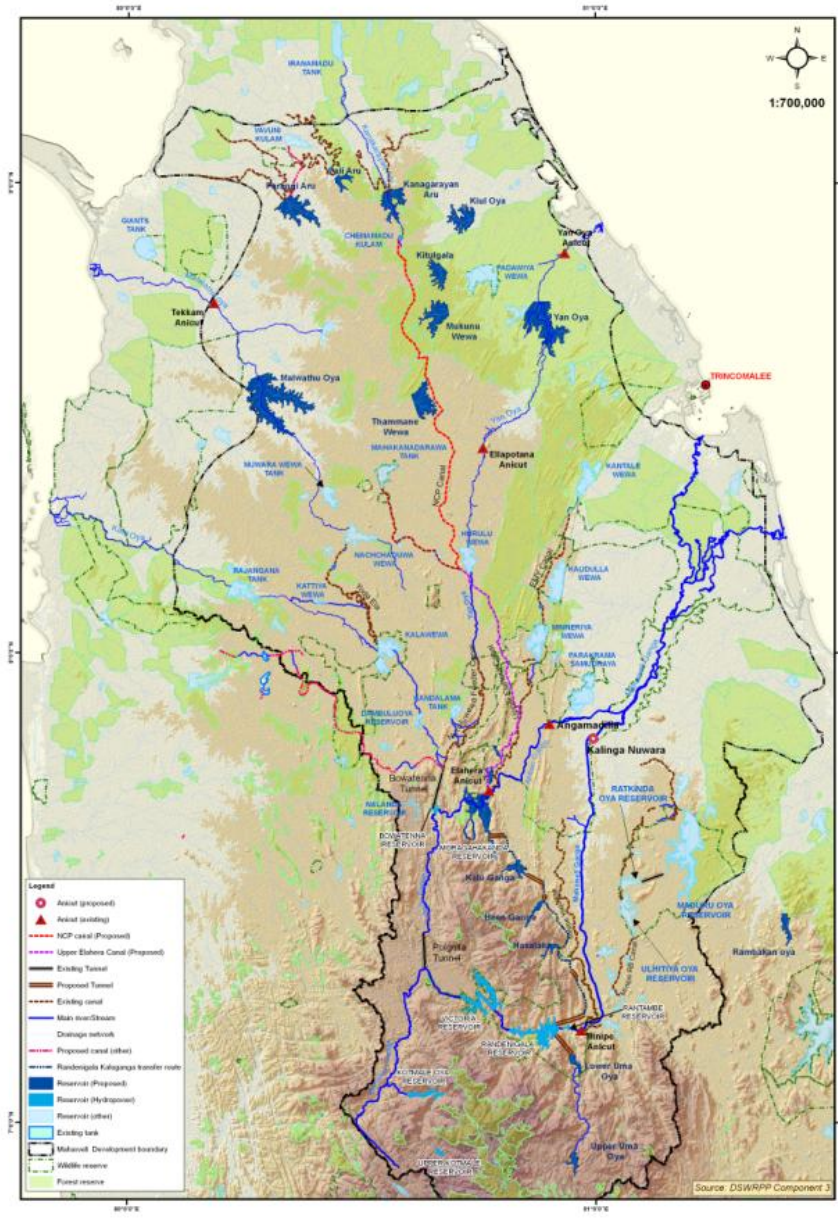
- Considered the possibility of diverting water from the Mahaweli Ganga to the North Central part of the country for irrigated agriculture.
- Recommended the development of 425 MW Hydropower & around 240,000 Ha for irrigation

UNDP/FAO Study
1965 -1968

- UNDP to undertake an independent comprehensive study of lands and water resources of Mahaweli Ganga including its own basin
- To make recommendations with the order of priority for development

NARBO
Network of Asian River Basin Organizations

Mahaweli Development Area



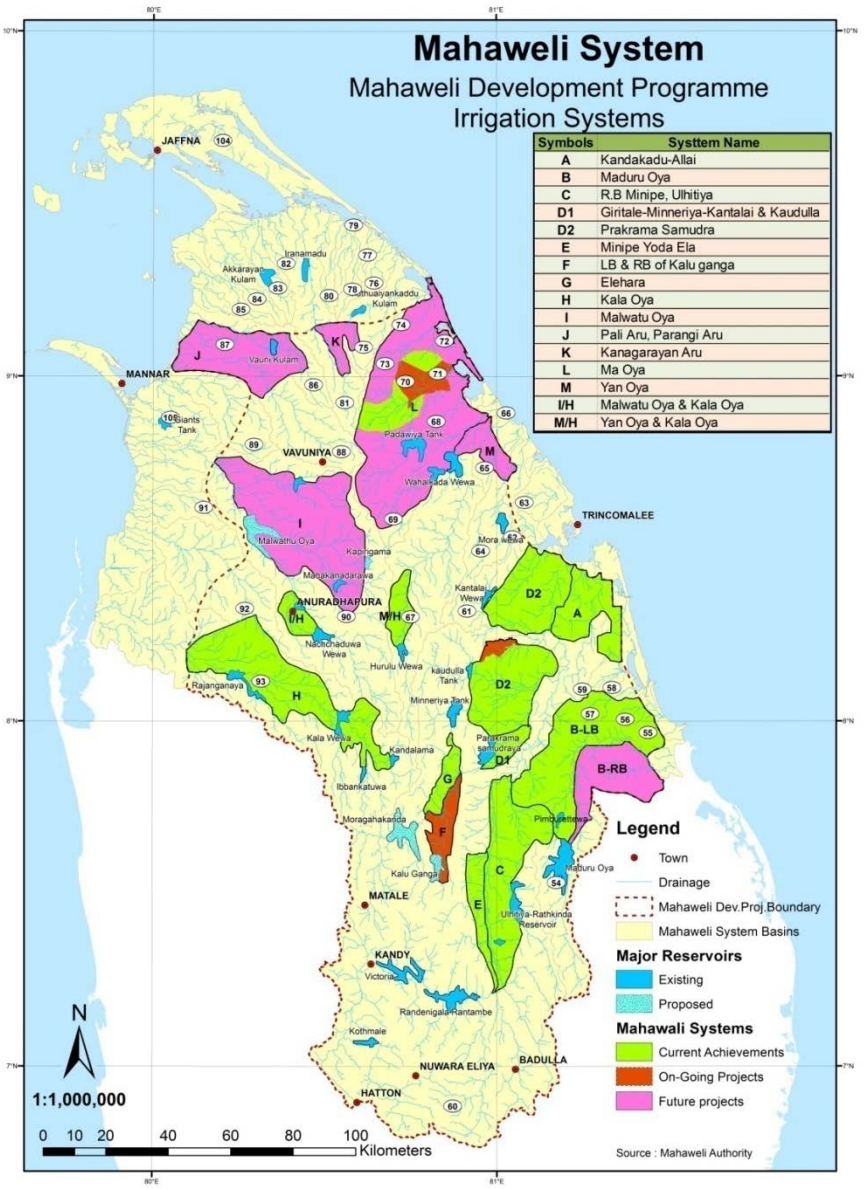
NARBO
Network of Asian River Basin Organizations

Proposals for Development

- Planned to complete in 3 phases in 30 years
- The land to be benefitted were grouped under 13 irrigation systems designating A to M
- The most economical projects were selected under phase 1: Low investment & high return projects

NARBO
Network of Asian River Basin Organizations

Mahaweli Systems



NARBO
Network of Asian River Basin Organizations

Phase I

Augmentation of Existing Systems & Development of New Areas

Project 1: **Polgolla Project**

For Irrigation development in Amban Ganga & Kala Oya basins

Project 2: **Victoria Multipurpose Project**

To meet the energy demand & also to irrigation in Mahaweli & Maduru oya Basins

Project 3: **Moragahakanda Multipurpose Reservoir**

For Irrigation Development in Mahaweli & Kala Oya Basins

NARBO
Network of Asian River Basin Organizations

Phase II

- Maduru Oya Project
- Taldena Multipurpose Project
- Associated Irrigation Development in Mahaweli Basin in systems A & B

NARBO
Network of Asian River Basin Organizations

Phase III

- Irrigation & land development in North Central part of the Country in Systems I, J, K, L, & M
- Completion of Hydro power development of Mahaweli and its tributaries

NARBO
Network of Asian River Basin Organizations

Proposed Headworks under Phase III

1. Randenigala reservoir and power station
2. Upper uma oya reservoir and power station
3. Lower uma oya and power station
4. Kalu ganga reservoir and power station
5. Pallewala reservoir and power station
6. Heen ganga reservoir and power station
7. Rotalawela reservoirKotmale multipurpose project
8. Ulhitiya reservoir with Minipe RB Transbasin canal
9. Left bank canal from Minipe anicut
10. North Central Province(NCP) canal from Amban ganga below Moragahakanda reservoir

NARBO
Network of Asian River Basin Organizations

Accelerated Mahaweli Programme in 1977

In 1977 Government decided to accelerate the Master plan

- Due to slow pace, impact on economy was marginal
- As a solution to the growing unemployment in resolving social unrest (nearly a million were unemployed in 1977)
- Self sufficiency in food
- Shortage of electrical energy

NARBO
Network of Asian River Basin Organizations

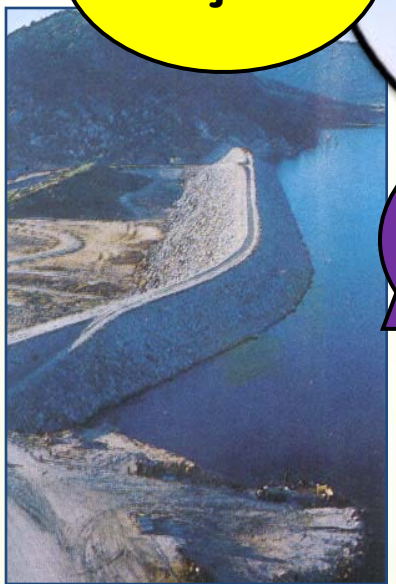
Randenigala Project

Kotmale Multipurpose Project

Projects undertake by AMDP

Victoria Multipurpose Project

Rantambe Project



Maduruoya Project

Downstream Irrigation & Social Infrasture Development in Systems H, C, B, G

NARBO
Network of Asian River Basin Organizations

Revisiting Master Plan- 2009

- On completion of Accelerated Mahaweli Development plan , necessity has been arisen to assess the availability of water resources for balance development with optimization of water resources for Irrigation, Water supply, Hydropower environmental, social, political and other factors.

Importance of Revisiting Master Plan

- Plan developed 50 years ago
- Population, living standards and Demands were less
- Value of water was less and bias for irrigation
- Priority of WRD is for rice self sufficiency and land settlement

NARBO
Network of Asian River Basin Organizations

Cont.

- Irrigation, Agricultural technology as well as Global agricultural and labour market were primitive

- Country could afford large public investments for infrastructure development

Issues at Present

- Climatic changes

  (High intensity short duration pattern)
- Frequent droughts and Floods
- Competition among different sectors resulting disputes
- Growing cities & changing living standards demand better sanitation and drinking water facilities

NARBO
Network of Asian River Basin Organizations

Cont.

- More weight for Power generation reducing water to NCP to a level of 69% of estimated 1270 mcm under MDMP
- Area developed- 160,000 ha. only
- Due to the diversion policy 50% of the irrigable land in System H remain uncultivated in Yala season
- Alarming increase in water pollution
- Improving irrigation efficiency

NARBO
Network of Asian River Basin Organizations

Assessment of Water Resources

- Operational data is available after the completion of major infrastructure
- Current agricultural practices are different to that at Master Plan stage
- Land availability for development is limited due to Forest, Wildlife and Environmental needs
- Alternative sources are available for power generation

NARBO
Network of Asian River Basin Organizations

Updating the Master Plan

- Government has recognize the importance of water resources planning and major investment in irrigation sector is envisaged.

- Therefore the Consultant SMEC International, Australia in association with DHI, Denmark was mobilized in 2009 to update the Master plan.

NARBO
Network of Asian River Basin Organizations

Updated Mahaweli Ganga Development Plan

Based on reassessment of available water resources and present & the future needs in the Area

- New portfolio of prioritized Mahaweli Ganga development proposals
- Provide guidance on how to resolve the issues among existing Users
- Will support pre-feasibility and feasibility studies for highest priority investment projects

NARBO
Network of Asian River Basin Organizations


Thank You . .