



Ayeyarwady River Basin Research Organization



multi-sectoral and trans-sectoral approach

**5th General meeting of NARBO and 2nd Asia Pacific Water Summit
Chiang Mai, 15-20 May 2013**

By WRTC

Water, Research and Training Centre (Myanmar)

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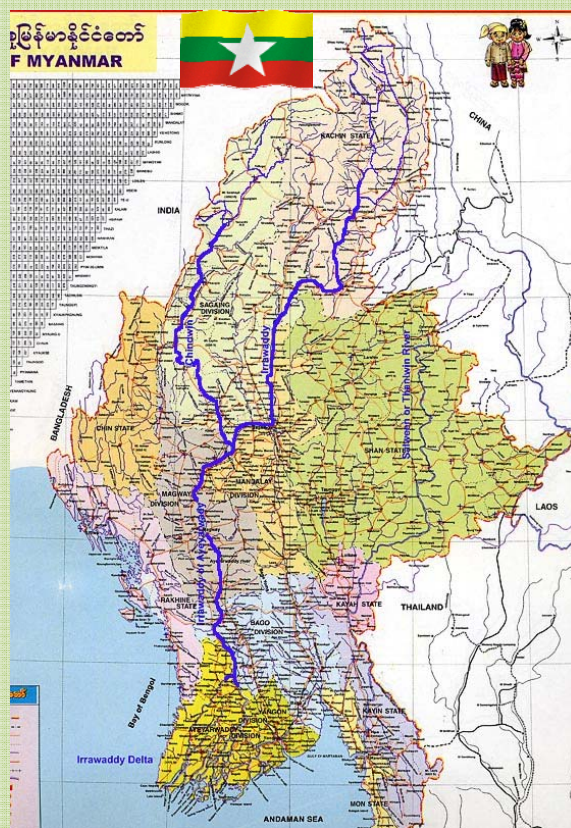
Logo Sources: www.un.org, Scientific American

Myanmar Overview



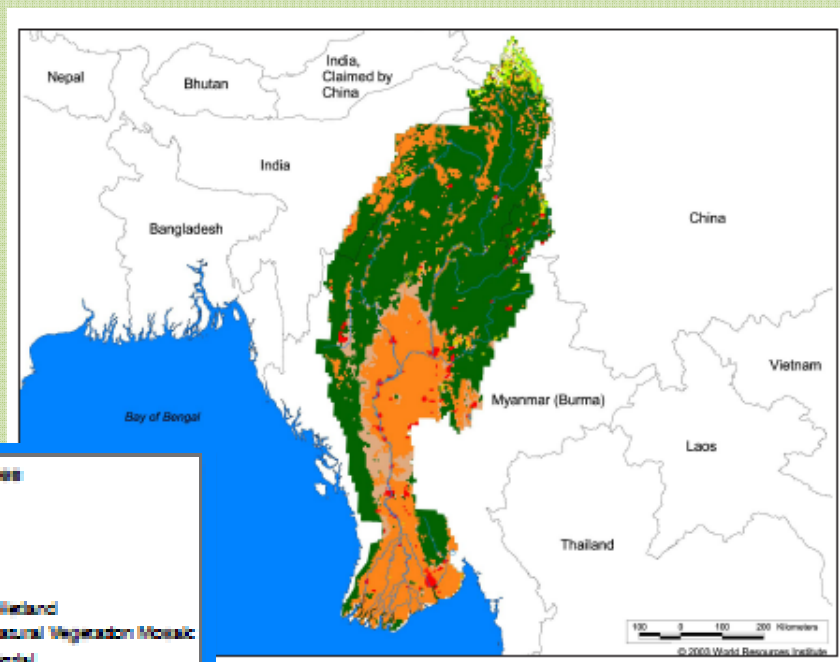
- **Location:** 9° 32' N & 28° 31' N, 92° 10' and 101° 11'E
- **Land area - 677,000 Sq Km**
- **Administratively divided into 7 Regions & 7 States – Population 62 million**
- **Agriculture based country (40.2 % of GDP)***
- **Tropical climate with three seasons**
 - **Rainy season (mid-May to mid-Oct.)**
 - **Winter season (mid-Oct. to mid-Feb.)**
 - **Summer season (mid-Feb. to mid-May)**
- **Large variation in average precipitation**
 - ❖ **Coastal (4000 mm to 5600 mm)**
 - ❖ **Central dry zone (600 mm to 1400 mm)**

Ayeyarwady River





Ayeyarwady River Basin

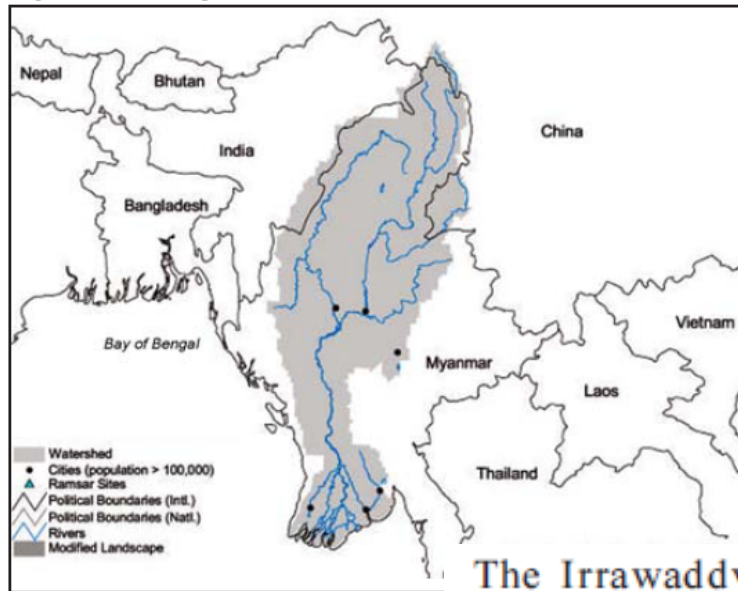


Source



Constitutes 61% of the total land area of Myanmar

Map: The Irrawaddy Basin



Source: Damming the Irrawaddy

The Irrawaddy River flows through the heartlands of Burma. The river's basin is 413,674 square kilometers, covering a remarkable 61% of Burma's total area.¹³ At approximately 2,170 kilometers long, it is Burma's most important commercial waterway.

Physical characteristics

- The Irrawaddy River flows through the heartlands of Myanmar.
- The river's basin is 413,674 square kilometers.
- It covers a remarkable 61% of Burma's total area.
- Approximately 2,170 kilometers long.
- 26 million peoples living in the basin area
- It is **the most important commercial waterway** of the country.

Physical characteristics (Contd.)

- Downstream, the river empties into the Andaman Sea through a nine-armed delta.
- The delta consists of a large and fertile plain that is 290 km long and 240 km wide.
- The lower part of the delta is a fragile and intricate ecosystem of mangrove swamps and tidal estuaries.
- The delta supports a population of over three million people and provides nearly 60% of Burma's total rice production.

Water in Myanmar

Water use distribution in 2009

Domestic use	6.0 %
Industry use	3.1 %
Agriculture use	90.9 %

Industrial water use will be increased by the further economic developments.

Livelihood along the river and in the delta

- Many people lost their livelihood along the river due to uncontrolled gold mining in the upper reach, flood, bank erosion, sedimentation, serious pollution and cyclones and other water-related disasters in the delta
- Water availability decreased
- Navigability is limited
- In the delta area peoples suffer from the extreme weather conditions caused by Climate Change and a lack of land rights.
- Private fish and shrimp farms and deforestation have destroyed the environment to such an extent that the World Wildlife Fund called the future survival of wildlife in the Irrawaddy freshwater swamp forest eco-region “bleak.”

Land Cover and Use Variables in the Ayeyarwady River Basin Area

Percent Forest Cover:	56.2
Percent Grassland, Savanna and Shrubland:	9.7
Percent Wetland:	6.3
Percent Cropland:	3.4
Percent Dryland Area:	4.4
Percent Urban and Industrial Area:	1.9
Percent Loss of original Forest Cover:	60.9

(2003 data by IUCN, WRI and

Key Dimensions :

- 1) Household Water Security
- 2) Economic Water Security
- 3) Urban Water Security
- 4) Environmental Water Security
- 5) Resilience to Water-Related Disasters
- 6) Planning for Irrawaddy River Basin
Development (Integrated Approach)

About ARBRO

- **Integrated Water Resources Management (IWRM) is recognized by many as the paradigm for establishing good water governance and putting water resources on the recovery path.**
- The Ayeyarwaddy River Basin Research Organizations (ARBRO) was established on 10 May 2012 to share knowledge and build capacity for IWRM in Ayeyarwaddy River Basin and other three major basins in Myanmar.
- 4 Major River Basins in Myanmar are: Ayeyarwaddy, Chindwin, Sittaung and Thanlwin.
- Registered under the Myanmar Law – recommended by the Directorate of Water Resources and Improvement of River Systems, Ministry of Transport
- **The first Public Consultative Meeting held on 9 Feb 2013**
- **The second meeting will be held in the second week of August 2013 – you are invited !**
- Currently 115 Members joined ARBRO
- **ARBRO contributes to the making of Good Water Governance in Myanmar by complementing the Government's efforts in this direction**

Biodiversity of the Irrawaddy River

- According to the UNEP - World Conservation Monitoring Centre, the Irrawaddy is:
 - ✓ one of the world's top 30 high priority river basins
 - ✓ due to (i) its support of high biodiversity and (ii) high vulnerability to future pressures
- Irrawaddy is home to 79 known fish species
- As of 2002 there were four known endemic bird areas in the basin
- The biodiversity of the river is still not well studied
- A new species of hill stream catfish was discovered in 2005
- The fifth most heavily silted river in the world.

Biodiversity of the Irrawaddy River (Contd.)

- Near Mandalay the river is habitat to the critically endangered Irrawaddy Dolphin.
- *Orcaella brevirostris* is one of only four species of river dolphins in the world.
- However, the dolphins' habitat in the Irrawaddy has declined nearly 60% in the last century.
- The best estimate of the current population is just 59 individuals.

Dams, Navigability and Bridges

Indicators: In the past 😊😞 **At present** 😊😞

Ships can navigate up to Homelin 😊😞

Livelihood along the Ayeyarwady River 😊😞

Water transport 😊😞

River water **quality** and quantity 😊😞 **(serious pollution!)**

Laws, Acts and Regulations (?)

Law enforcement (?)

Dams are controversial – see IHP guidelines, WCD report, etc.

Peoples participation and awareness 😞😊

Not too late to begin the rehabilitation process!

Planning for Ayeyarwady River Basin Development

Planning for Ayeyarwady River Basin Development

Geographical Divisions for Development

1. Upper Reach
2. Middle Reach
3. Delta – lower reach

Information note on Delta:

In the year 1980 master plan for "Ayeyarwaddy Basin Integrated Agricultural Development " was studied with the assistant from JICA in the delta area.

The studied covered 17 dam projects on the left side of the delta and 16 dam projects on the right of the delta. Between 1988 and 2007, 15 dam projects on the left side were implemented to cover 186,100 ha and on the right 8 dam projects were implemented and irrigated about 21,900 ha.

Planning for Ayeyarwady River Basin Development (Contd.)

ARBRO is a multi-stakeholders platform also.

Organizational Plan in the light of adaptation to the Climate Change: –

- Research Network – on going – **110+ members**
- Natural science + Social science Research Work
- River Modeling Centre – to be established
 - Data Bank – verify, collect, generate
 - Knowledge Bank
 - Research Groups
 - Survey Groups
 - Modeling Groups
 - Training Groups – Media – Public Speakers
 - GIS & RS Group
 - Water quality Groups
 - Civil Society Coordination – Action

Sectoral Components and Approaches

Multi-sectoral approach:

- Agriculture and Irrigation (MOAI)
- Water Resources and Improvement of the River Systems (MoT)
- Hydro-power development (Ministry of Electrical Power No.1)
- Fishery (MoLF)
- Water Conservation and Utilisation (MOAI)
- Finance (Ministry of Finance and Revenue)
- Planning (Ministry of Planning)
- Environment (Ministry of Environmental Conservation and Forestry)
- Education (MoE, MoT and MOST)
- Transboundary issues (MOFA)
- Civil Society Organisations

**Climate Change Factor
Data Bank
Research Network**

Trans-sectoral approach:

- Effective Institutional Framework
- Water Resources Ministry
- Myanmar Water Partnership (includes most of the sectors above)

Approach for Irrawaddy River Basin Development

Approach

- Integrated River Basin Management Approach
(Trans-sectoral approach)

Tools

- Institutional Framework - River Basin Organization under the auspices of Sustainable Water Resources Development Standing Committee (SWRDSC) – ongoing discussions
- Integrated Water Resources Management (IWRM)

Geographical and hydrological divisions

- Sub-basins and 3 geographical segments
- Upper Reach – Middle Reach (Dry Zone) – Delta

Steps for Irrawaddy Basin Development

(Contd.)

- Revisit the 30 years old Irrawaddy Master Plan (studied in 1988)
- Draw a new road map for River Basin Development
- Knowledge Centre with a comprehensive Data Bank
- Data development and data generation - Role of Hydroinformatics – Prediction of Ungaged Basins
- Participatory decision making process

**Thank you
for your time and attention**