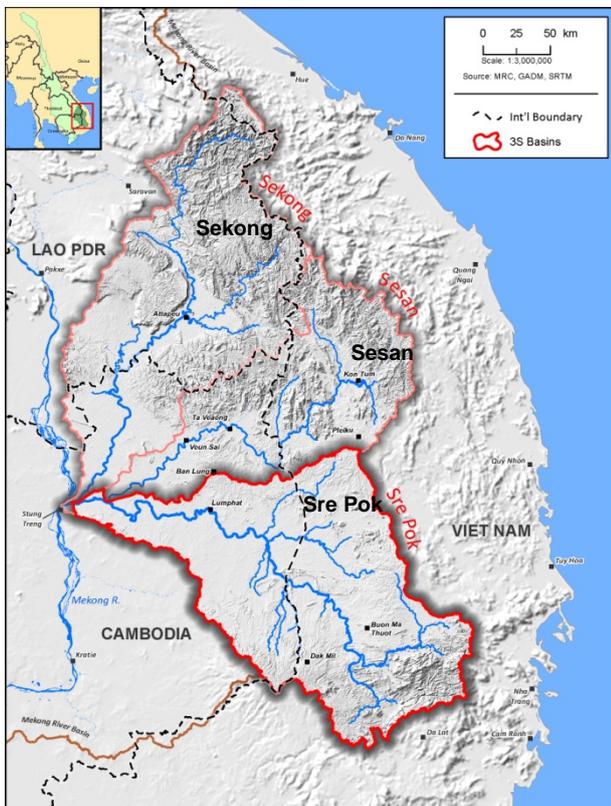


Profile: the Sre Pok Basin

The Sre Pok River Basin is an important trans-boundary tributary to the Mekong River, shared by Cambodia and Viet Nam. The 30,940 km² basin lies to the south of the adjacent Sesan and Sekong Basins. Collectively, these basins are known as the 3S Basins, and form the largest and most important trans-boundary watershed of the Mekong River, contributing up to 20% of the Mekong's annual discharge and 15% of its life-giving sediment. The largest of the basins, the Sre Pok, has the highest fish diversity and greatest protected area coverage, but faces pressures from changes in flow patterns and land cover.

Overview



Location of the Sre Pok River Basin within the 3S Basins.

The Sre Pok occupies nearly 40% of the entire 3S Basins (which in turn make up 10% of the total area of the Mekong Basin). In addition to being the largest of the 3S Basins, the Sre Pok has the highest human population and widest elevation range. Cambodia and Viet Nam share similar areas of the basin, although they differ topographically, with most of the area in Cambodia being of relatively lower

elevation. Flows from the Sre Pok River are joined by the Sesan in its lower reaches, and subsequently, by the Sekong 7.5 km upstream of their confluence with the Mekong River. The Sre Pok Basin primarily overlaps the provinces of Dak Lak, Dak Nong, Gia Lai and Lam Dong in Viet Nam and Monduliri, Ratanakiri and Stung Treng in Cambodia.

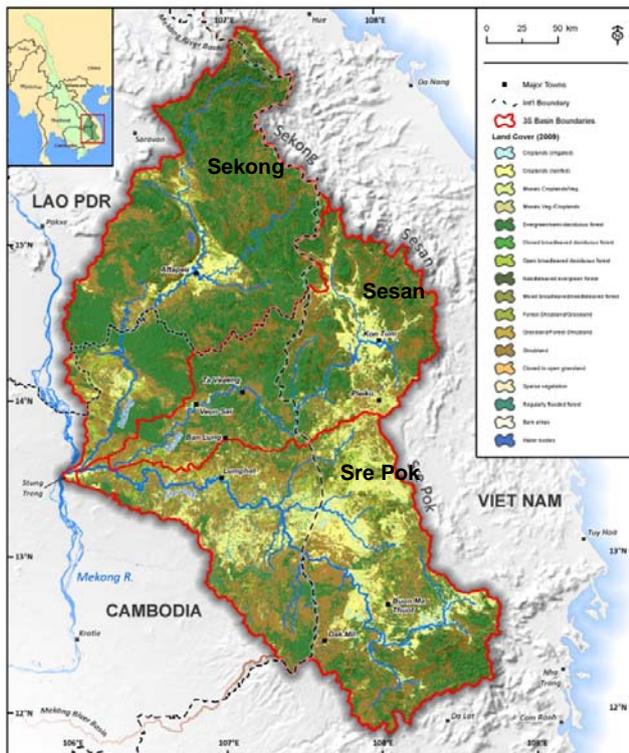
Sre Pok Basin, in Figures

VARIABLE	COUNTRY	
	Cambodia	Viet Nam
Basin Area (km ²)	12,780	18,162
Basin Length (km)	180	150
Basin Width (km)	160	220
River Length (km)	265	160
Elevation Range (m)	45–1,081	140–2,409
Mean Elevation (m)	218	525
Mean Slope (deg.)	2.4	6.8
Provinces	Monduliri, Ratanakiri, Stung Treng, Kratie ¹	Dak Lak, Dak Nong, Gia Lai, Lam Dong
Major Towns	Lumphat	Dak Mil, Buon Ma Thuot
Population (2012)	128,070	2,139,470
Pop. Density (pers./km ²)	10	118
Mean Precip. (mm)	1,569	1,575
Mean Temp. (°C)	23.2	21.2
Major Protected Areas	Lomphot NP, Nsok PF, Monduliri PF, Phnom Prich WS, Pnom Namlear WS	Bi Dup-Nui Ba NR, Chu Hoa NR, Chu Yang Sin NR, Dak Mang NR, Ho Lak, Nam Ca NR, Nam Nung NR, Ta Dung NR

¹MRC. Lower Mekong Basin Historical Hydro Meteorology database (data from before year 2000); temperature from WorldClim.

Climate and water resources

Climate is heavily influenced by the seasonal monsoon, with precipitation peaking in between July and September. The Sre Pok differs from the Sesan and Sekong in that a large proportion of the basin is relatively flat and of low elevation. Partially as a result of this topography, the Sre Pok is also drier and hotter, averaging 22°C and receiving less than 1,600 mm of mean annual precipitation. An exception is in high elevation areas southeast of Buon Ma Thuot, where cooler temperatures and higher levels of precipitation prevail. Here, more than 2,000 mm of rain can fall during an average year.²



Land cover in 2009. The upper Sesan has a large area under agricultural cultivation. Data: GlobCover 2009.

Topography and Land Cover

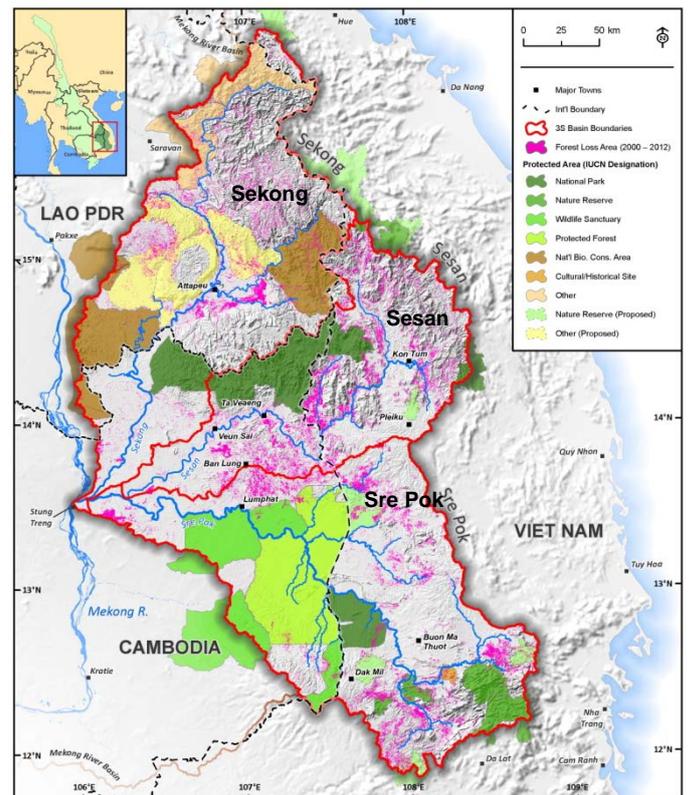
Land cover in the Sre Pok basin also differs significantly from the other two basins. The flatter topography and larger population have contributed to faster development and agricultural expansion. The latest land cover analysis available from the Mekong River Commission (2003) showed plantations covering 1,750 km² (nearly 6% of the basin). This figure has since increased, as have agricultural and built-up areas.³ Much of the

²MRC. Lower Mekong Basin Historical Hydro Meteorology database (data from before year 2000).

³GlobCover 2009.

land cover change in recent years has been caused by conversion of natural forest to industrial plantations and agriculture. Reservoirs for hydropower and irrigation purposes have converted some forest and grassland areas into open water.

Irrigated cropland area differs largely between the two countries in the basin. In Cambodia, a lack of irrigation infrastructure limits dry season rice production, and irrigated rice production was estimated to bring in less than USD 120,000 per year, or just over 1% of revenue for the area.⁴



Protected areas and forest loss (purple) from 2001–2012. Data: MRC 2009, Hansen et al. 2013, WDPA 2013.

Protected Areas

The Sre Pok has the most protected areas within the 3S Basins. In Cambodia, these include Mondulkiri and Nsok Protected Forests, and Lomphat, Phnom Prich, and Phnom Namlear Wildlife Sanctuaries. Viet Nam has seven nature reserves in the upper basin, as well as a cultural/historic site at Ho Lak and Yok Don National Park.

Yok Don National Park is adjacent to the Mondulkiri Protected Forest and forms the

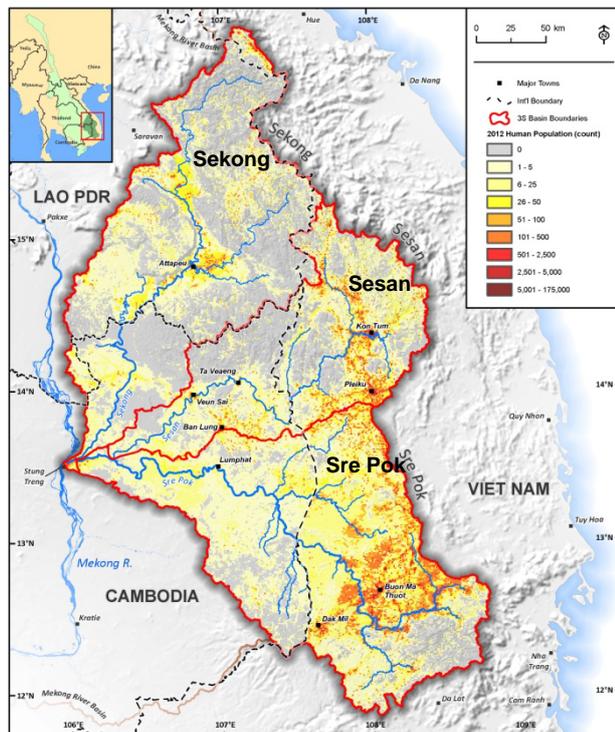
⁴CNMC 2011, pg. 50.

largest contiguous area of dry deciduous forest in Asia which is considered very important for the conservation of large mammals.

Population

The Sre Pok is by far the most populated of the 3S Basins. Of the nearly 4.7 million residents in the 3S, 2.9 million (61%) call the Sre Pok home. Population is concentrated around the provincial capital of Buon Ma Thuot, Dak Mil, and along transportation corridors. Viet Nam makes up 94% of the population in the Sre Pok.

Population density is similarly divided. In Viet Nam, density is estimated at 118 people/km², more than 10 times that in Cambodia.⁵ Population in Cambodia, however, is growing at 1.7% per year. Viet Nam has also seen large population increases due to migration (e.g. between 2006 and 2010 the town of Pleiku grew by 86,000 residents⁶).



Human population distribution in the 3S Basins. More than 94% of the population in the Sre Pok is lives in Viet Nam.

Fisheries

Fish diversity is especially high in the Sre Pok. Although covering only 4% of the Mekong Basin, the Sre Pok is home to more than a third of its fish species. The 240 species recorded represent 73% of the total found in the 3S.⁷

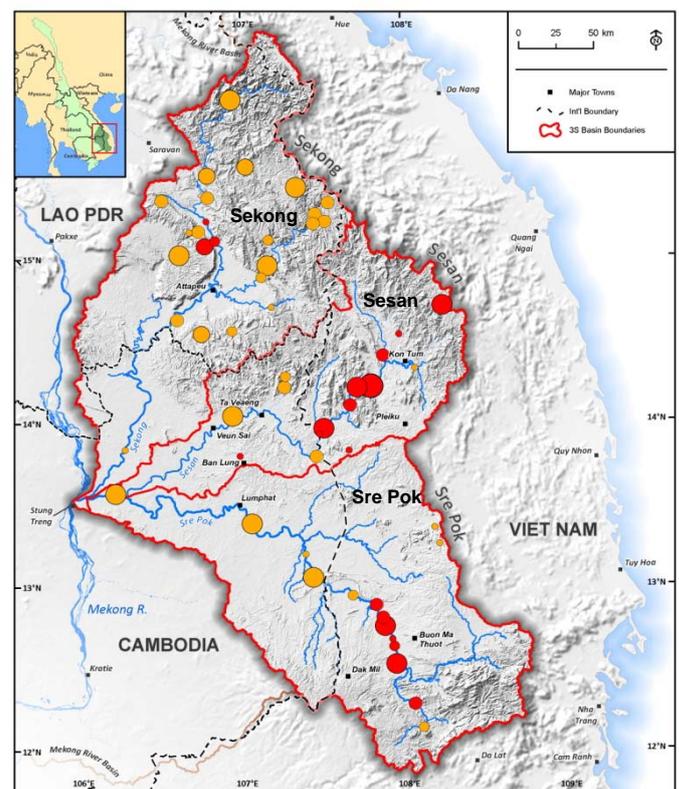
⁵Landsan 2012.
⁶Hong et al. 2013.
⁷Baran et al. 2013.

Basin	Fish Species	% Total	Fish Families	% Total
Sekong	213	65%	33	37%
Sesan	133	40%	26	29%
Sre Pok	240	73%	33	37%
TOTAL	329	-	89	-

Number of fish species in the 3S Basins and per cent of total in the Mekong River Basin. Source: Modified from Baran et al. 2013.

At least 81 (33%) of the species found in the Sre Pok are migratory and depend on connectivity to adjacent areas.⁸ Furthermore, these migratory species make up 60% of total fish catch.⁹ River communities depend heavily on fish as a source of protein and, in some areas, for a significant part of their income. The exact value of the fishery here is unknown, but in 2008 was estimated as at least USD1 million, with some estimates well above USD10 million per year.¹⁰

Hydropower



Existing (red) and planned or under construction (orange) hydropower dams. Size represents relative production capacity. One large dam is under construction below the confluence with the Sesan River and two more are planned further upstream.. Data: MRC 2009.

⁸Ibid.
⁹Baran et al. 2011.
¹⁰Baran et al. 2011.

Like the Sesan, the Sre Pok River has seen the construction of a cascade of hydropower dams in its upper half. Most recently, the Sre Pok 4A and Hoa Phu dams were completed Viet Nam in 2013 and 2014, respectively. Currently, there are seven moderate to large hydropower dams already in the basin, with one under construction in Cambodia and at least four more under consideration.¹¹

Legal framework and key institutions

Key institutions governing water resources include the Ministry of Natural Resources and the Environment (MONRE) in each country, the Ministry of Agriculture and Rural Development (MARD) in Viet Nam, and the Ministry of Agriculture and Forestry in Cambodia.

A variety of laws on the environment, water resources, fisheries, and strategic development plans influence water resources, but have only domestic jurisdiction. The main official mechanism for intergovernmental cooperation within the Mekong Basin is the Mekong River Commission. However, there is no substantive, basin-specific agreement governing water resources management or development in the Sre Pok. As such diplomatic channels are critical for managing trans-boundary water resources.

In August 2014, the UN Water Courses Convention (UNWC),¹² came into force after Viet Nam became the 35th signatory. The convention does not take direct effect in the 3S Basins until a neighbouring country also ratifies it. However, the UNWC could play an important role in future developments in the region by providing guiding principles while respecting the existing Mekong Agreement.

Threats and Emerging Issues

One of the most significant threats to the Sre Pok and wider region may be from the construction of hydropower dams which have affected the flow regime of the river and could potentially impact fisheries throughout the greater Mekong Basin. The Lower Se San/Sre Pok 2 dam is of particular concern. Research has predicted up to a 9.3% decline in fishery

resources throughout the entire Mekong Basin from this dam alone.¹³

The expansion of industrial plantations and filling reservoirs has altered land cover in areas of the Sre Pok. Between 2000 and 2012 around 6% of the basins forests were lost.¹⁴ The expansion of other agricultural crops has added to forest conversion and is thought to be depleting groundwater resources. Mining is also a concern for potential impacts to water quality and land cover.

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¹¹Viet Nam National Mekong Committee. (2003). Analysis of Sub-Area 7V. Basin Development Plan.

¹²UNWC, formally titled the "U.N. Convention on the Law of Non-Navigational Uses of International Watercourses."

¹³Ziv et al. 2013.

¹⁴Hansen et al. 2013.

BRIDGE:

Building river dialogue and governance

This publication is produced as part of the IUCN BRIDGE project in the Mekong 3S.

IUCN (International Union for Conservation of Nature), under the umbrella of the Building River Dialogue and Governance (BRIDGE) project supported by the Swiss Agency for Development and Cooperation (SDC), seeks to facilitate cooperative processes in the 3S region by developing and strengthening water governance capacities through governance reforms, stakeholder dialogues and knowledge exchange programmes.

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BRIDGE 3S Basins website: www.3sbasin.org

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www.iucn.org/about/union/secretariat/offices/asia/regional_activities/bridge_3s/

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