

BCI GIS DATABASE: CURRENT STATUS AND GAPS

1. To support decision making in the GMS Biodiversity Conservation Corridors Initiative (BCI), regional technical assistance (RETA) 6213 from the Asian Development Bank has built up a comprehensive geographical information system containing both environmental and socioeconomic data. A description of the datasets and notes on the remaining gaps follow.

A. Environmental Data

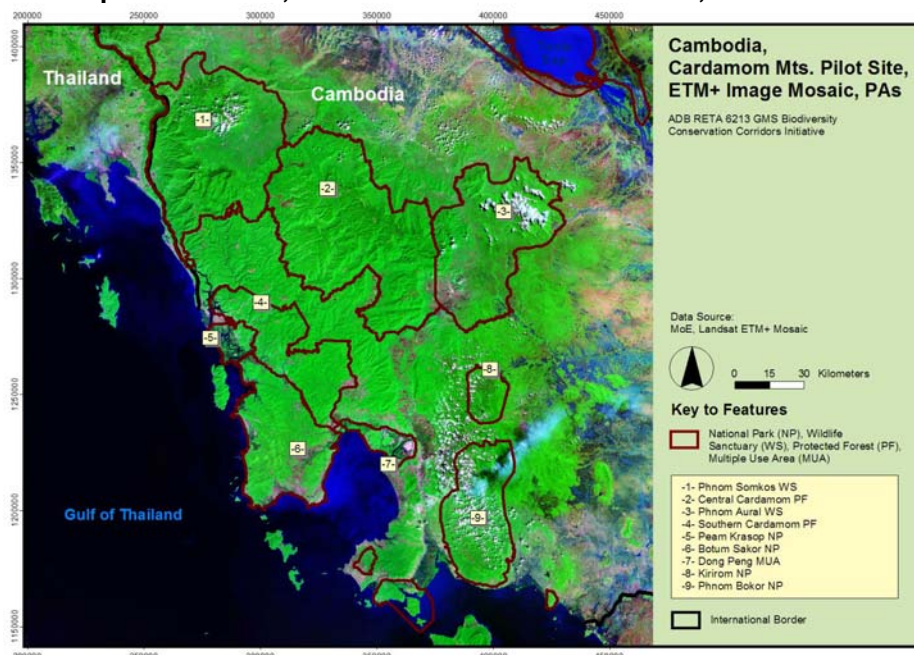
2. **Satellite imagery.** The image database archives scenes of three different satellite sensors:

- (i) Landsat TM, covering the entire Greater Mekong Subregion (GMS) during 1990–1992. Maximum geospatial resolution is 30 meters (m);
- (ii) Landsat ETM+, covering the entire GMS during 1999–2001). Cambodia, the Lao PDR, and parts of Viet Nam are also covered during 2002–2004. Maximum geospatial resolution is 15 m after pan sharpening (see examples in maps 1 and 2); and
- (iii) ASTER, covering most of Cambodia during 2002/03. Maximum geospatial resolution is 15 m after pan sharpening.

3. Thus, although the satellite image archive covers all biodiversity conservation landscapes and pilot sites, image information is at least two (Cambodia, Lao PDR) to five years old (other GMS countries).

4. For areas that are not yet archived for 2002–2004, images will be successively retrieved from the Earth Science Data Interface. Additional, up-to-date high-resolution imagery (e.g., SPOT V, IKONOS, QUICKBIRD) should be bought to produce land-cover information at the level of precision required for detailed pilot-site planning of Phase 1.

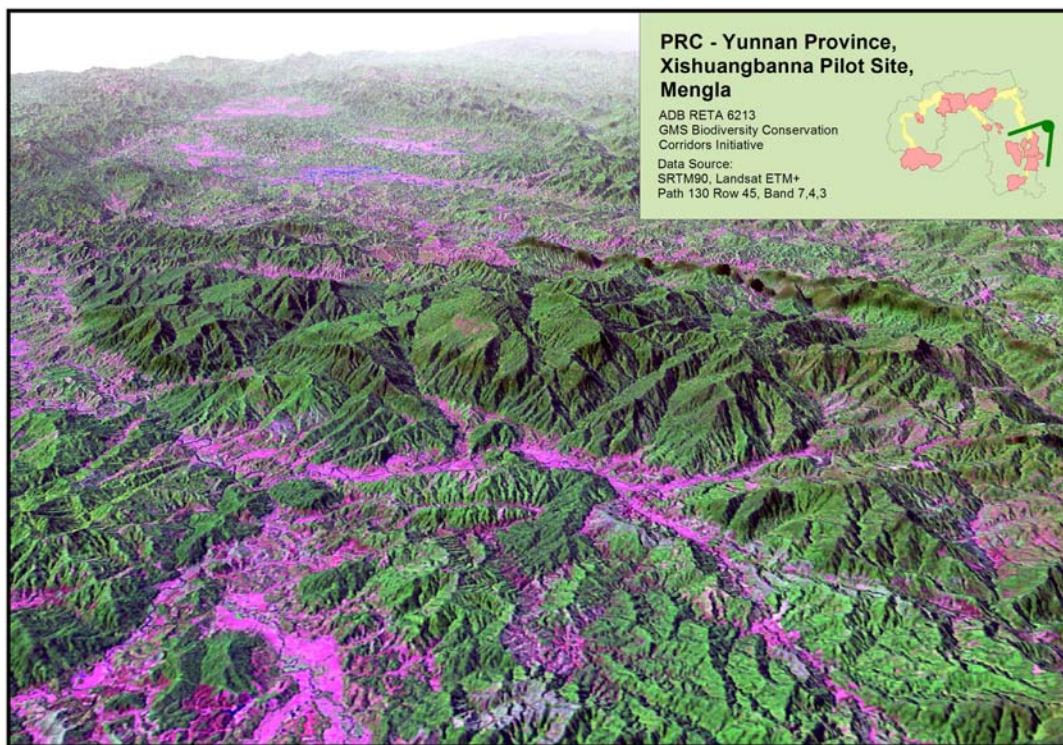
Map 1. Cambodia, Cardamom Mountains Pilot Site, ETM+ Mosaic



5. **Topography.** BCI uses region-wide shuttle radar topographic mission data of 90-m resolution. Slope, aspect, and hillshade information has been calculated from this dataset at the same resolution and is available for the entire GMS.

6. More precise topographic data are available for the lower Mekong River watersheds. The digital elevation model (DEM) provided by the Mekong River Commission (MRC) has been derived from digitized toposheets and covers almost the entire Lao PDR and Cambodia at 50-m resolution. Corresponding datasets are available for parts of Viet Nam and for Cambodia (through the Japan International Cooperation Agency [JICA]). For precise pilot site assessment, DEMs of 20-m resolution should be made available. Such data are currently not available for any pilot site.

Map 2. Xishuangbanna Pilot Site, PRC Yunnan Province; 3-D View of Mengla Nature Reserve



7. **Land cover, land use.** BCI holds five regional or subregional land cover classifications: (i) United Nations Environment Programme (UNEP) RRC.AP land cover classification based on the US National Oceanic and Atmospheric Administration advanced very high resolution radiometer, 1986 and 1993; (ii) United Nations Food and Agriculture Organization Global Forest Resource Assessment, 2000; (iii) European Commission – Joint Research Centre land cover classification for South and Southeast Asia, 2000; (iv) UNEP RRC.AP land cover classification for BCI Strategic Environment Framework SEF¹ “hotspots” in the GMS, 1999–2001; and (v) MRC land cover classification for the lower Mekong River watersheds, 1997. All five datasets are either not of sufficient geospatial resolution for analysis within the pilot sites (1, 2, and 3) or need a thorough update/accuracy check before further use (4, 5).

8. Several national datasets have been retrieved from government offices and nongovernment organizations (NGOs) in the GMS countries. For Viet Nam, the World Wide Fund for Nature (WWF) land cover classification of 2000 is available to BCI. However, the official Forest Inventory and Planning Institute dataset (1998–2002) is available only for selected provinces not in the pilot site area. The Lao PDR has provided countrywide land cover classification for 1992 and 2000 via the Forest Administration, as well as a WWF adaptation of the 1997 MRC land cover classification that fits with the respective land cover classification of Viet Nam. For Cambodia, BCI holds both the JICA (1996/2002) dataset and a subset of the forest cover classification of the Forest Administration (2002), covering the Cardamom pilot site. BCI also holds the nationwide land cover classification of the Royal Forest Department (2000) of Thailand. The People's Republic of China (PRC) could not provide BCI with a land cover classification for Yunnan Province.

9. The national datasets are of improved geospatial resolution. However, most of them are at least five-years old, which limit their precision. A more prominent problem with these datasets is the lack of standardization. Objective benchmarks have not been used in the classifications to describe and define the classes. Thus, data integration to provide a seamless, comparable transboundary dataset for the entire region is not possible. BCI needs to derive its own land cover classification for the pilot sites to ensure precise site planning.

10. **Biodiversity.** Comprehensive surveys have been made available for Cambodia (Cardamom and Eastern Plains Pilot Site) by Conservation International, Fauna and Flora International, WildAid, and WWF. WWF has provided countrywide biodiversity surveys for the Lao PDR and Viet Nam. However, the resolution is inadequate to provide a good decision base for the scale of the selected pilot sites. This is also the case in Thailand, where the Royal Forest Department has only conducted an elephant survey on the Western Forest Complex. For the PRC, biodiversity information was not immediately accessible to BCI.

11. **River and water body network.** Datasets are archived and have been accessed nationwide for Cambodia, Thailand, and Viet Nam. The dataset on the Lao PDR needs refinement at the pilot site scale. For the PRC, comprehensive river data are available only for Xishuangbanna Prefecture. A general problem of all the datasets is that they do not specify river names, particularly of smaller tributaries.

B. Administrative and Socioeconomic Data

12. BCI currently holds a complete boundary/administrative dataset on provinces. District level boundaries are also available GMS-wide, although the Thailand dataset needs revision. Subdistrict administrative boundaries are available for Cambodia and Viet Nam.

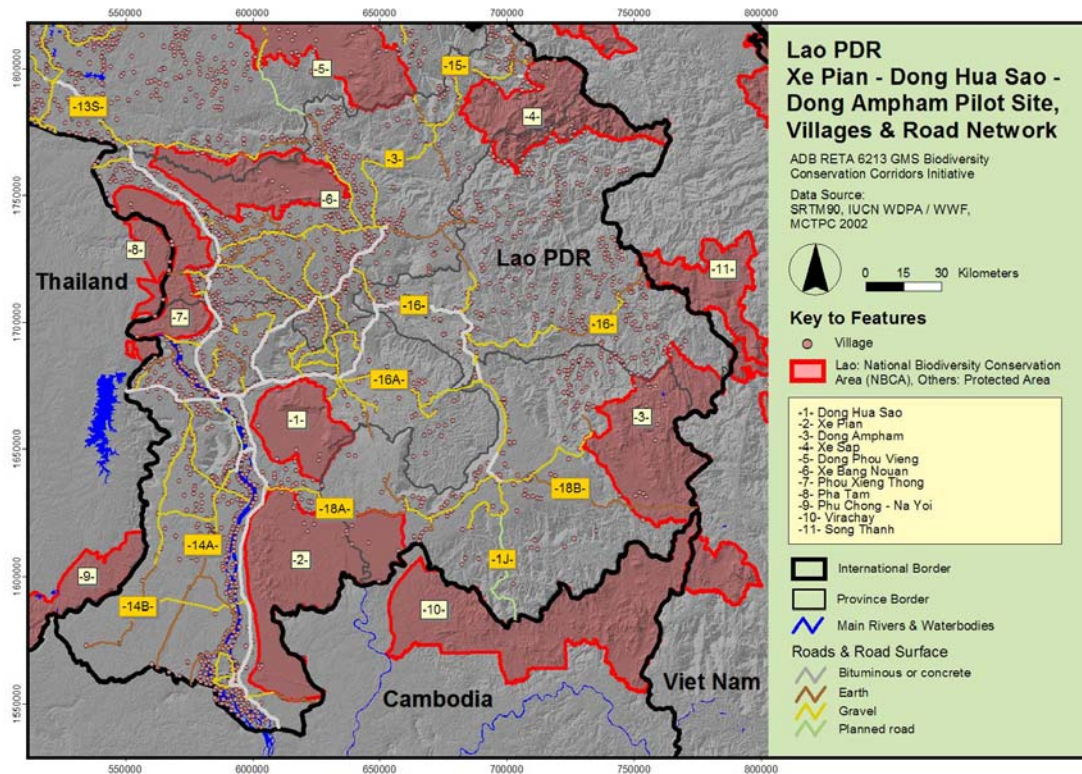
13. Population data (village datasets) are available nationwide for the Lao PDR and Cambodia. The PRC has provided village data for Xishuangbanna Prefecture and Deqin County. However, translation from the Chinese characters remains an issue. For Thailand, precise village data are only available for parts of the Western Forest Complex. WWF Viet Nam has provided a settlement polygon layer for Quang Nam and bordering provinces. This dataset does not contain village names.

14. On protected areas, the BCI database includes both the World Conservation Union (IUCN) World Database on Protected Areas (WDPA) and more precise national datasets,

provided either by NGOs (WildAid Thailand, WWF) or respective government offices. For the PRC, the national protected area database has been provided only for the subset of Xishuangbanna Prefecture and Deqin county.

15. Infrastructure data available to BCI include transboundary and national roads, railroad networks, and airports. As the subregional dataset lacks precision on the pilot-site scale, national datasets have been retrieved. BCI holds detailed road datasets for Cambodia, Lao PDR (Map 3), and Viet Nam. Thailand has provided precise road data only for the Western Forest Complex area, and PRC only for Xishuangbanna prefecture and Deqin county.

Map 3. Lao PDR, Xe Pian – Dong Hua Sao – Dong Ampham Pilot Site, Village, and Road Network



16. GIS-ready socioeconomic statistics are available on a province level for the entire GMS. They include population density, population growth, and poverty. District-level poverty information has been imported to the respective geospatial boundary map from sources such as the International Food Policy Research Institute (Viet Nam), World Food Programme (Cambodia) and the Lao PDR National Growth and Poverty Eradication Strategy. BCI also holds comprehensive subdistrict data on Yunnan Province (Map 4; county level, Yunnan Statistical Yearbook 2000) and Viet Nam (Communes, Quang Nam, WWF), Thailand (Tambons, Western Forest Complex, Royal Forest Department). Still, there are several pilot sites for which commune-level data are not yet available, particularly Xishuangbanna pilot site, Cardamom and Eastern Forest Complex pilot sites, and Xe Pian – Dong Hua Sao – Dong Ampham pilot site. These data should be made available to thoroughly assess these pilot sites in Phase 1.

Map 4. PRC Yunnan Province, Population by County (2000)

