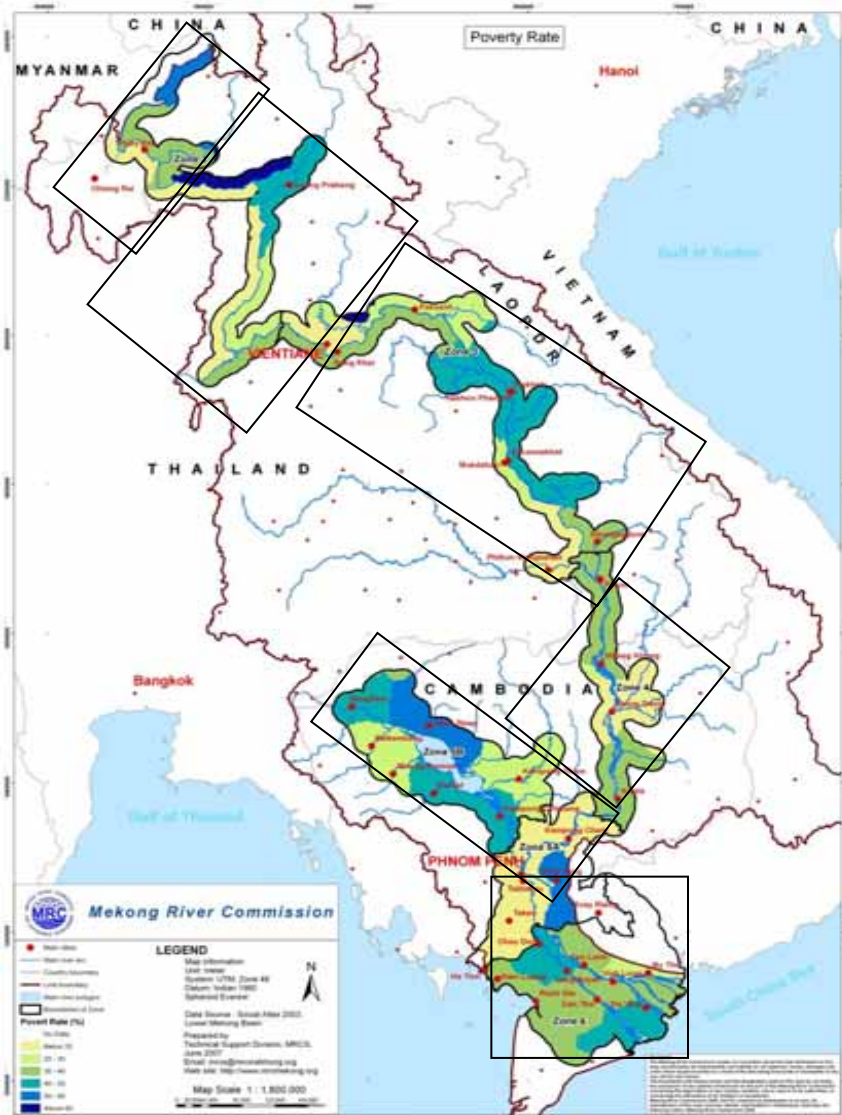


Social Impacts in Hydro-ecological Zones in the LMB and Mekong Mainstream Dams

1



The SEA defined a 15km impact corridor, here shown in hydro-ecological zones and poverty rates

1. Zone 1 – China to Chiang Saen
2. Zone 2 – Chiang Saen to Vientiane (Pak Beng, Louang Prabang, Xayabouri, Pak Lay, Xanakham, Pak Chom)
3. Zone 3 – Vientiane to Pakse (Ban Koum, Latsua)
4. Zone 4 – Pakse to Kratie (Don Sahong, Thakho, Stung Treng, Sambor)
5. Zone 5 – Kratie to Phnom Penh, including Tonle Sap
6. Zone 6 – Phnom Penh to Mekong Delta and sea

Issue 1: Poverty Reduction & the Natural Resource Base in the LMB – Opportunities in All Zones

2

- Level of direct & indirect impacts depends on degree of dependence on natural resource base – highest in Laos, Cambodia, lowest Thailand
- Impacts also depending on pre-existing conditions (e.g. urban expansion and new work opportunities, improved road access and market opportunities)
 1. Public infrastructure improved (school, health)
 2. Road networks improved with better all-weather access for surrounding areas
 3. Market access improved with roads and bridges
 4. Revenue benefits directed towards poverty alleviation
 5. Enhanced project-related work and service provision opportunities
 6. Improved household access to electricity

Issue 1 (cont.): Poverty Reduction & the Natural Resource Base in the LMB – Risks in All Zones

3

- Loss of existing land and river livelihood resource base without sufficient replacement/compensation
- Replacement land of equal size and productivity not easily available
- Loss of homes, property, assets, community infrastructure, and buildings/locations of cultural/spiritual/historic significance
- Psycho-social adjustment difficulties for many relocated communities
- Increase of land values and associated exclusion of poorer communities
- Revenue benefits not equably shared and trickle-down to poorest limited
- Developer with little or no commitment to social and environmental mitigation may not provide many direct poverty alleviation advantages for affected communities
- Pace & intensity of economic development happening faster than local and national capacities to deal with it

Issue 2: Health & Nutrition – Opportunities in All Zones

4

- Health impact mitigation measures properly applied can lead to significant reduction of chronic complaints (e.g. parasitic infections)
- Commitment by developer to improve capacity of local health staff and village health workers, and develop health IEC on different topics for districts and communities (e.g. malaria, TB, STDs)
- Properly implemented and monitored construction worker health programme preventing spread of infections to project districts
- Infrastructure improvement providing safe domestic water supply, sanitation and wastewater disposal facilities
- Road construction making health facilities and staff more easily accessible

Issue 2: Health & Nutrition – Risks in All Zones

5

- Elevated groundwater levels leading to waterlogging & higher risks of vector disease transmission (malaria, dengue, filariasis)
- Reduced access to free wild foods (forests, fisheries, wetlands) limiting availability of important sources of nutritional intake
- Loss/reduction of agricultural land without adequate replacement risking increased food insecurity for agricultural cultivators via productivity loss
- Sudden changes in water flows leading to risk of river users & livestock being washed away
- Unexpected flooding leading to loss of life, property and assets
- Poorly managed health interaction with construction workers leading to risk of increased STDs/HIV/AIDS transmission to local communities

Issue 3: Resettlement, Land Acquisition, Accessibility – Opportunities in All Zones

6

- Improved infrastructure (e.g. roads, bridges) providing better access to goods, services and markets
- Improved access to facilities e.g. hospitals, clinics, schools, electricity supply, all-weather roads
- Developers investing in project areas providing financial inputs to localised poverty reduction

Issue 3: Resettlement, Land Acquisition, Accessibility – Risks in All Zones

7

- Loss of land, assets, homes, livelihoods
- Benefits grabbing by stronger groups – boom & bust
- Double jeopardy – already affected communities
- Vulnerable groups squeezed out by dominant groups
- Poor resettlement process leading to break-up of social and cultural groups, resulting in marginalisation and loss of socio-cultural capital
- Loss of spiritually and culturally significant locations (spirit forests, cultural sites)
- Limited commitment by developer and failure to provide adequate funding leading to greater adverse impacts than well planned and managed resettlement and livelihood restoration activities

Indirect Impacts

8

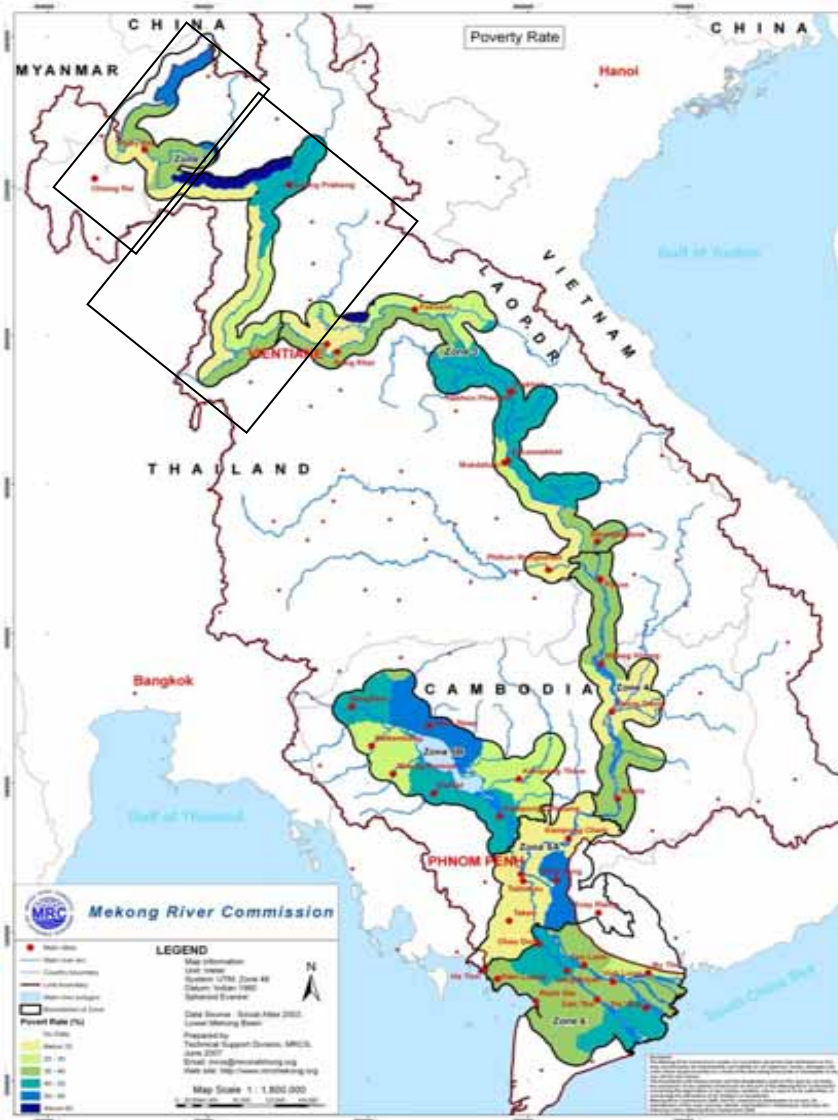
Defining Indirect Impacts:

- Not losing house or land, not requiring relocation, but affected by indirect or cumulative impacts, such as loss of access, loss of livelihood, health consequences
- Indirect impacts often become apparent during operational stage, but some are experienced during construction and impoundment stages.
- Indirect impacts can also include “unexpected impacts”, that could not be anticipated but need addressing
- Local riparian communities are normally the most exposed to indirect impacts (e.g. 2 million population of 47 riparian districts in immediate headpond, construction & downstream of the 12 dams)
- Larger numbers of people are usually affected by indirect impacts than by direct impacts

Indirect Social Impacts – Some examples in Zone 2: Chiang Saen to Vientiane

Pak Beng, Louang Prabang, Xayaboury, Pak Lay, Xanakham, Pak Chom

9



- High numbers of ethnic minorities living below poverty line, very dependent on natural resource base (swidden cultivation, rivers/streams, forest products)
- Risk to way of life, e.g. ethnic minority common property resources
- **Replacement agricultural land very scarce – lack of available land may result in communities clearing more areas, risking increased erosion in turn leading to additional unexpected relocation**
- **Prior relocation of ethnic minorities – double jeopardy**
- **Pak Ou caves more limited access, tourism impacts**
- **Cultural festivals (e.g. Giant Mekong Catfish festival, Chiang Khong) dependent on species continuing**
- Livelihood opportunities - differences between Laos and Thailand
- **Earlier loss of riverbank cultivation (earlier onset of flood season)**
- **Loss of river-based alternative livelihoods (e.g. river weed)**
- Increasingly towards Vientiane plain, larger & more prosperous population dependent on fixed riparian agriculture & fisheries and more urban access – benefits from infrastructure access
- Improved irrigation opportunities Pak Chom with higher productivity potential leading to improved agricultural incomes

Indirect Social Impacts: Zone 3: Vientiane to Pakse

Ban Koum, Latsua

Zone 4: Pakse to Kratie Don Sahong, Thakho, Stung Treng, Sambor

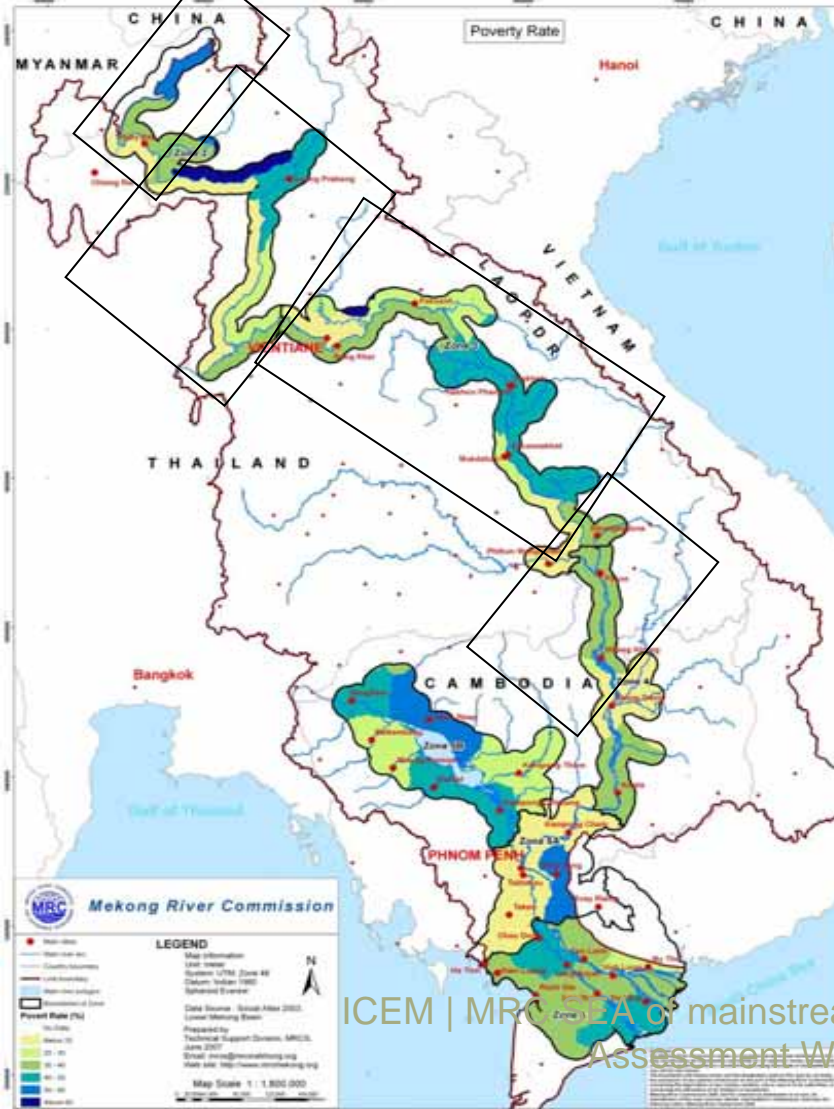
10

Zone 3

- High population numbers and high dependency on fixed riparian agriculture & fisheries (& Zone 4)
- High riparian land values & greater compensation costs (& Zone 4)
- **Poorest districts of Thailand and some of the poorest districts of Lao PDR (& Zone 4)**
- Riverbank garden cultivation season shortened & loss of some gardens (& Zone 4)
- Pump stations needing resiting (& Zone 4)
- **Riverbank cultural assets threatened (e.g. riverside temples, shrines & sacred trees)**
- **Elevated groundwater levels – benefits domestic water supply, risks waterlogging & increased vector disease (& Zone 4)**
- **High risk of accidental flooding due to operator error, with consequent risks of loss of land, property, livestock and life**
- Improved irrigation opportunities with higher productivity potential leading to improved agricultural incomes

Zone 4

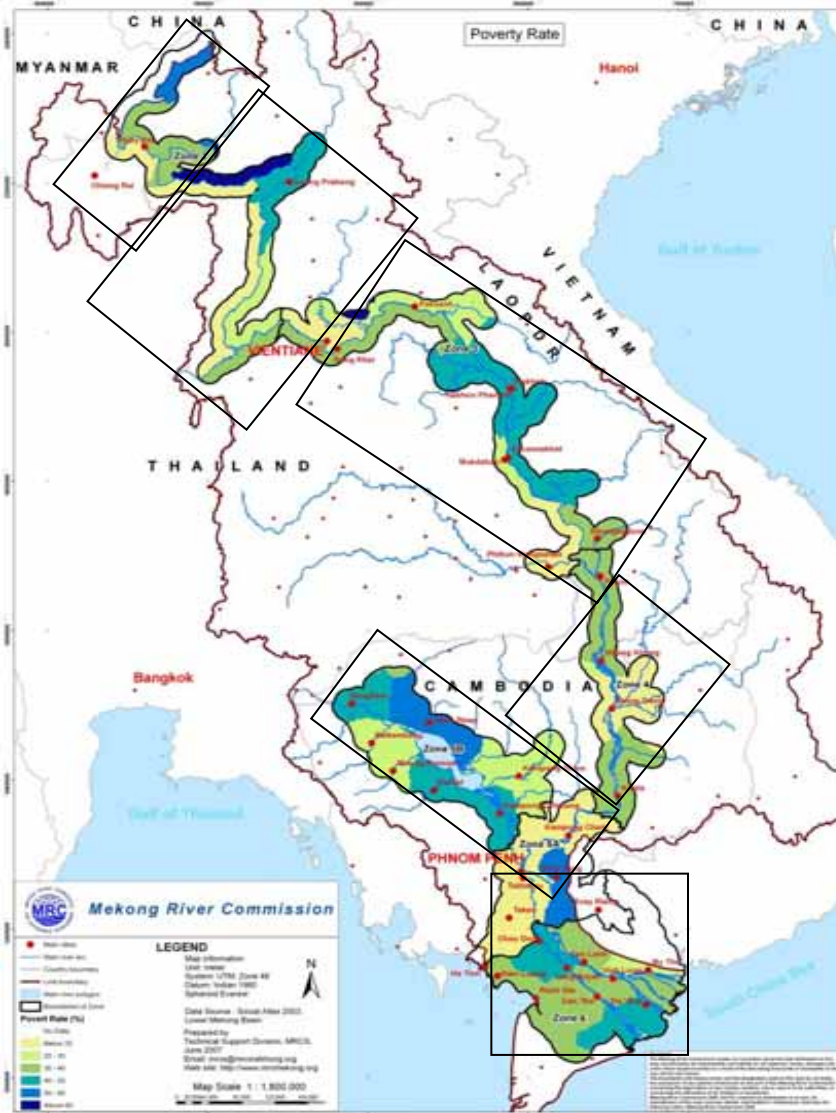
- **Loss of tourism & fisheries livelihoods opportunities (Khone Phapheng Falls & Stung Treng Ramsar site)**
- Transboundary (Lao/Thai & Lao/Cambodian) impacts requiring agreements
- **Double jeopardy in Cambodia with prior land sequestration**
- **Poor households have higher dependence on fisheries in Stung Treng (c.1/3 more income dependence) and more vulnerable to changes**
- Early warning systems of flow changes/flooding needed to prevent loss of life, livestock & assets (& Zone 3)
- **Loss of riverbank gardens, income and subsistence loss**



Indirect Social Impacts – Zone 5: Kratie to Phnom Penh + Tonle Sap

Zone 6: Phnom Penh to Mekong Delta & sea

11



Zone 5

- Very high poverty levels
- Fisheries productivity reduced (addressed elsewhere)
- **Wetlands affected, higher risk of food insecurity**
- **Floating homes affected by river/Tonle Sap water flow changes**
- Water intakes/pump stations needing compensation and/or costs of relocation/adjustment met
- **Impacts on communities depending on floods and water flows. Adjustments needed for livelihood activities and access (e.g.Kratie flood arrival delayed c.2 weeks, duration reduced c. 1 week)**

Zone 6

- Impacts on delta irrigation systems leading to higher costs of operation & maintenance
- Delta river & waterway transport affected by channel instability, leading to potential loss of associated livelihoods
- Delta upstream heavily populated/cultivated areas at risk of greater erosion, with potential livelihood & asset loss consequences

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Populations of Directly Affected Riparian Districts in the immediate Impact areas of 12 dams

12

No.	Dam Name	No. Affected Provinces	No. Affected Districts	Total Affected District Population
1	Pakbeng	4	8	223,659
2	Louang Prabang	2	4	159,204
3	Xayaboury	2	4	202,198
4	Pak Lay	3	7	282,544
5	Sanakham	2	4	160,974
6	Pak Chom	4	13	588,189
7	Ban Koum	3	8	413,140
8	Lat Sua	2	4	255,160
9	Don Sahong	2	5	250,217
20	Thakho	NA	NA	NA
11	Stung Treng	1	2	52,326
12	Sambor	1	2	145,610
	Totals	13	47	2,094,749

Total Number of People directly affected by the 12 dams

13

Villages Affected:	203
Villages Relocated:	131
Households Affected:	16,744
Households Relocated:	6,847
People Affected:	107,120
People Relocated:	63,112

Figures currently under-estimated because some statistics not available, some not supplied, no Resettlement Plans available, and based on assumption of least-impact technical design of dams where designs have been made available to the SEA team

Numbers of Indirectly Affected People

14

- Not possible to provide accurate figures at this stage as still many knowledge gaps. Some people will be indirectly affected more severely than others.
- LMB populations at risk in a 15km Mekong impact corridor for Laos, Thailand & Cambodia totals 11,507,038
- LMB population in Vietnamese delta at risk totals 11,974, 813 (concept of 15km impact corridor not relevant for Vietnam)
- Cumulative impacts may take some time to make themselves known, e.g. erosion in the Vietnamese delta and consequences for agriculturally-dependent households
- Numbers will further depend on risk management. Poor management of dams and erratic water releases increase numbers of affected people, e.g. 76,368 population in Pakse at risk of Latsua or Ban Koum failures
- Numbers will also depend on developers' willingness to implement remedial procedures, e.g. if health/drainage/sanitation programmes not implemented adequately, proportionate risk of higher numbers of affected people

Numbers of Indirectly Affected People (2)

15

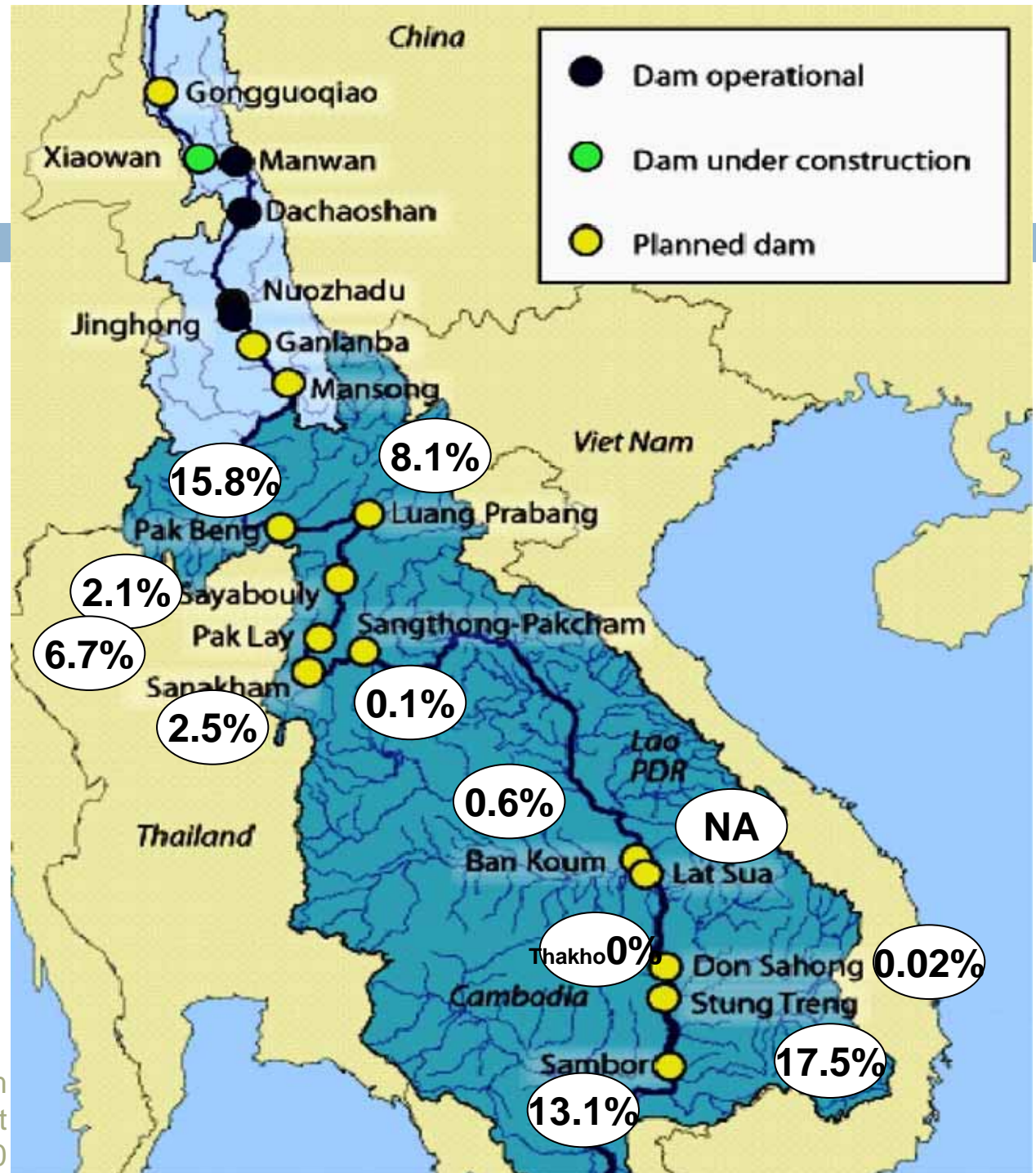
- Indications that the poorest will be most adversely affected, particularly:
 1. In locations with high prior levels of poverty (e.g. Lao districts in Zone 2; Cambodian fishing communities in Stung Treng and Tonle Sap; Vietnamese agriculturally/fisheries-dependent communities in the Mekong delta)
 2. Those more dependent on natural resource base, where the poor are disproportionately represented (e.g. fisheries, upland swidden locations)
 3. High proportion of already poor ethnic minorities in Zones 2 & 4, who will be affected, and who may experience particularly difficulty in adjusting to new economic structures
 4. The poor (& ethnic groups) already relocated or losing land before the project and will lose again (Zones 2 & 4)

Timing of impacts depending on timing of construction & COD

16

- 1: Construction & associated facilities – land acquisition for access roads, contractors' camps, dam site, transmission lines, etc.
- 2: Impoundment phase – land and properties inundated
- 3: Operations phase – downstream impacts
- 4: Long-term cumulative impacts becoming evident over the years

% District Populations Directly Affected by each dam— Impacts at different project stages: construction, impoundment, operations



Equity of Risk

18

- Distribution of risk of direct and indirect impacts not equitable, e.g. people losing agricultural land are not the same people who will benefit from improved irrigation opportunities
- Methodology and competence of mitigation and avoidance measures could increase or decrease equity of risk

Conflict Resolution

19

4 potential areas of conflict:

- Non-transboundary dams: between affected persons (APs) and the developer – **could be dealt with by national policies and procedures**
- Between APs and different developers where the same people may be affected at different times by different dams – **challenge of assigning compensation & mitigation responsibilities & costs**
- Transboundary dams – between APs in different countries with a single developer – **challenge of safeguard equity given different country regulatory framework on land acquisition & compensation**
- Transboundary dams – between governments of neighbouring countries over transboundary social & environmental impacts – **no conflict resolution mechanism in place**