# Environmental Enforcement Strategies and Practices in Taiwan

*Hsiao-Wen Liang*

*Bureau of Environmental Inspection, Environmental Protection Administration, Taiwan*

*September 22, 2015*

## Outline

- Types of Non-Compliance
- Environmental Law Enforcement Strategies
- Case Example in Taiwan
- Conclusion

Types of Non-Compliance

Environmental Law Enforcement Strategies

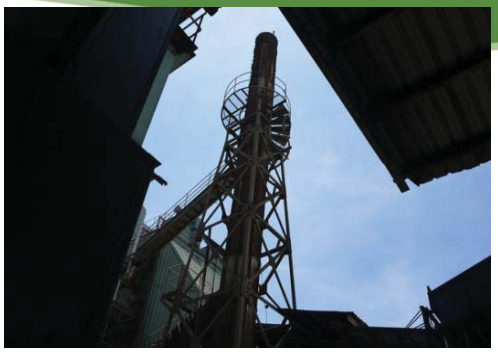
Case Example in Taiwan

Conclusion



# Types of Non-Compliance

- Manufacturing process without using air pollution control equipment
- Un-treated wastewater
- Discard empty containers of solvent
- Illegally dumping of solid waste



Types of Non-Compliance

**Environmental Law Enforcement Strategies**

Case Example in Taiwan

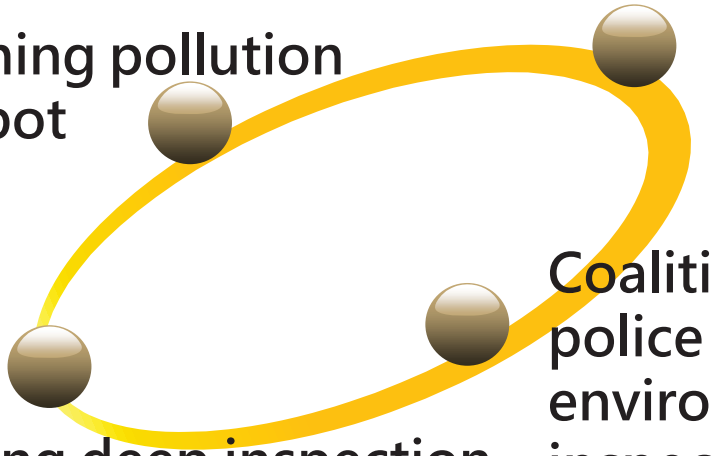
Conclusion



# Environmental Law Enforcement Strategies

Calculating illegal economic benefits from non-compliance

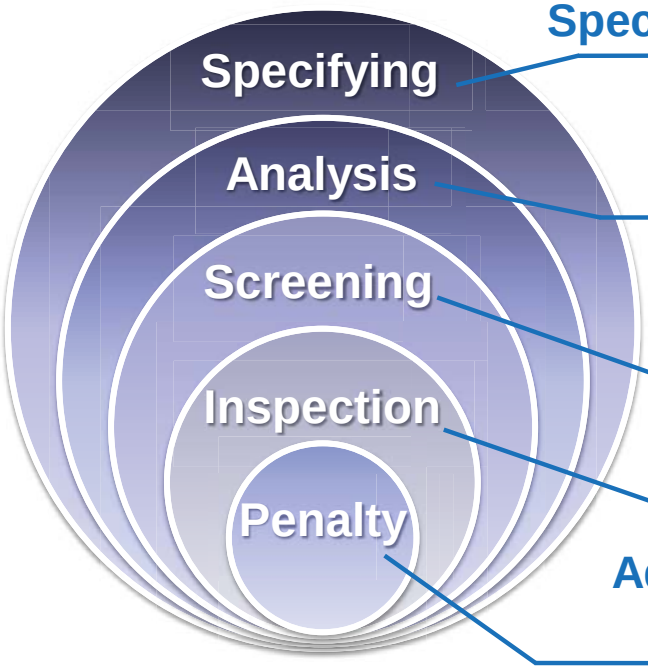
Screening pollution hot-spot



Coalition of prosecution, police and environmental inspection authorities

Executing deep inspection

# Screening Pollution Hot-Spot




Specify industry, region, time

Statistical analysis of relevant information

Screening enterprises with high risk and high pollution

Select inspection targets

Administrative penalty, bring to justice



# Deep Inspection

- Information
- Mass
- Cash

3 Flows

5 Approaches

- Eyes
- Mouth
- Hands
- Feet
- Mind

C P R

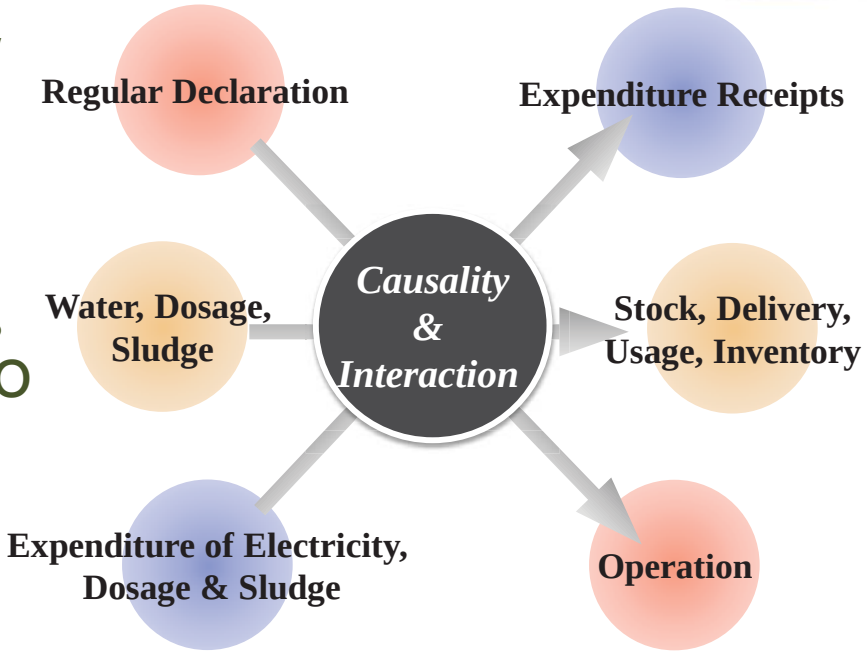
- Copy
- Picture
- Record

Tools

- Ex-ante proposal
- Working note
- Mechanic instrument

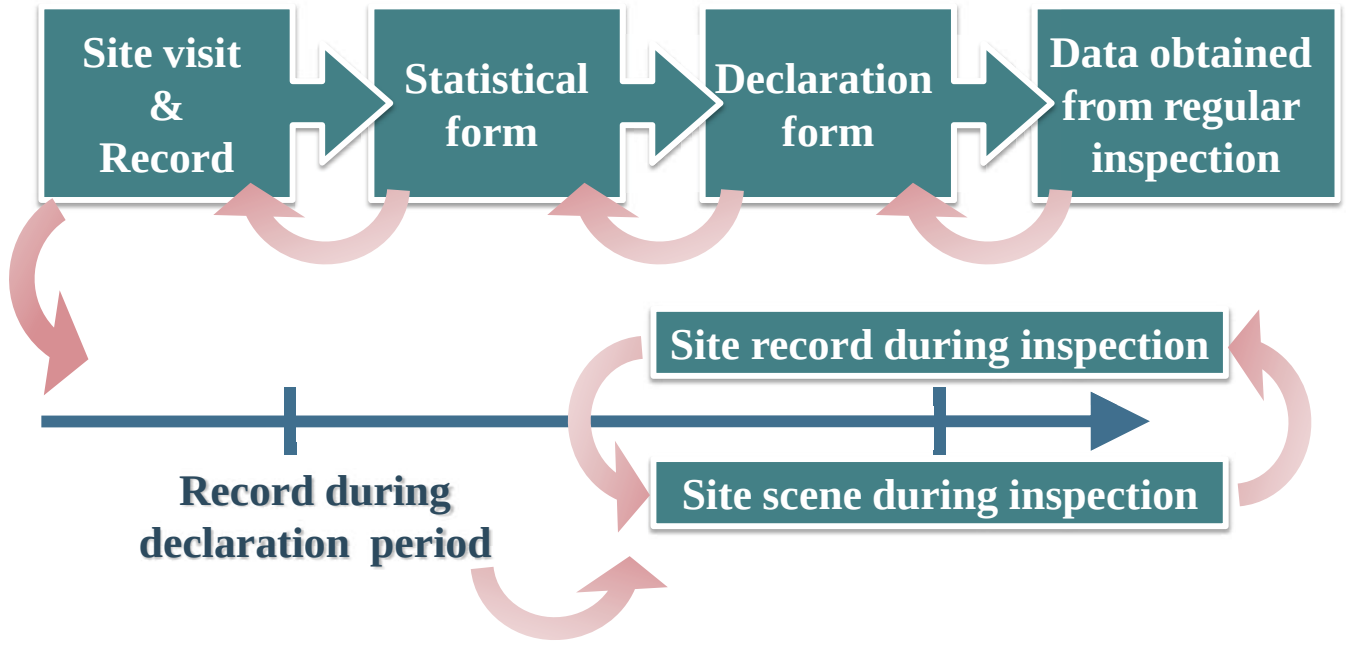
# Theory：3 Flows

- Tracking information flow to evaluate the accuracy of operation
- Calculating mass flow to ensure I/O balance
- Comparing cash flow to examine expenditures



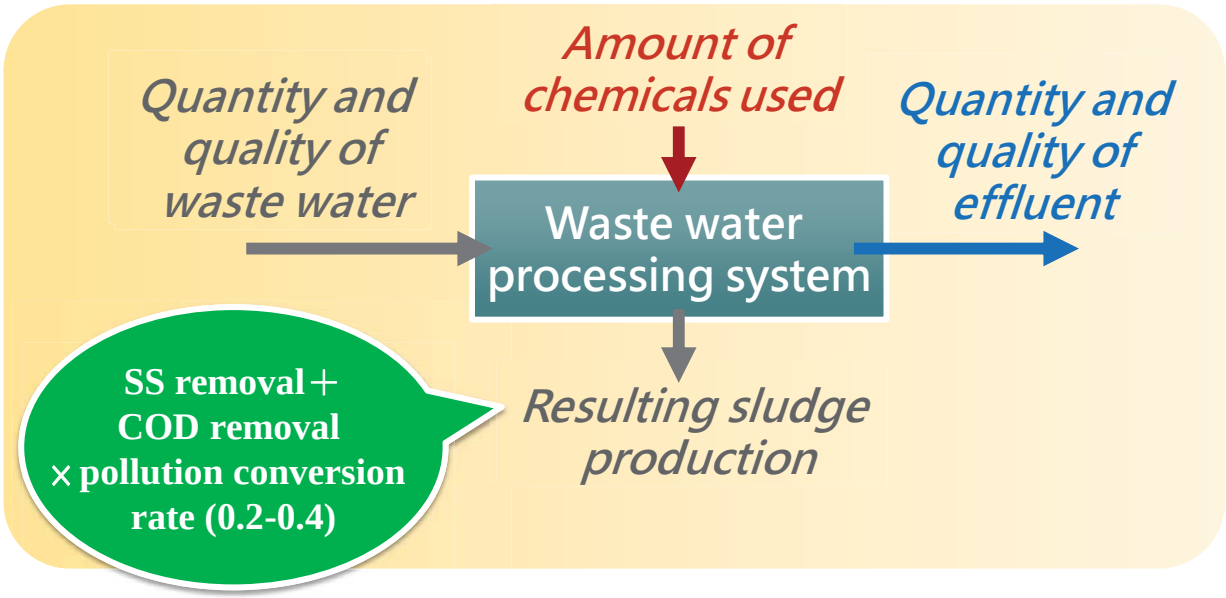



# Information Flow



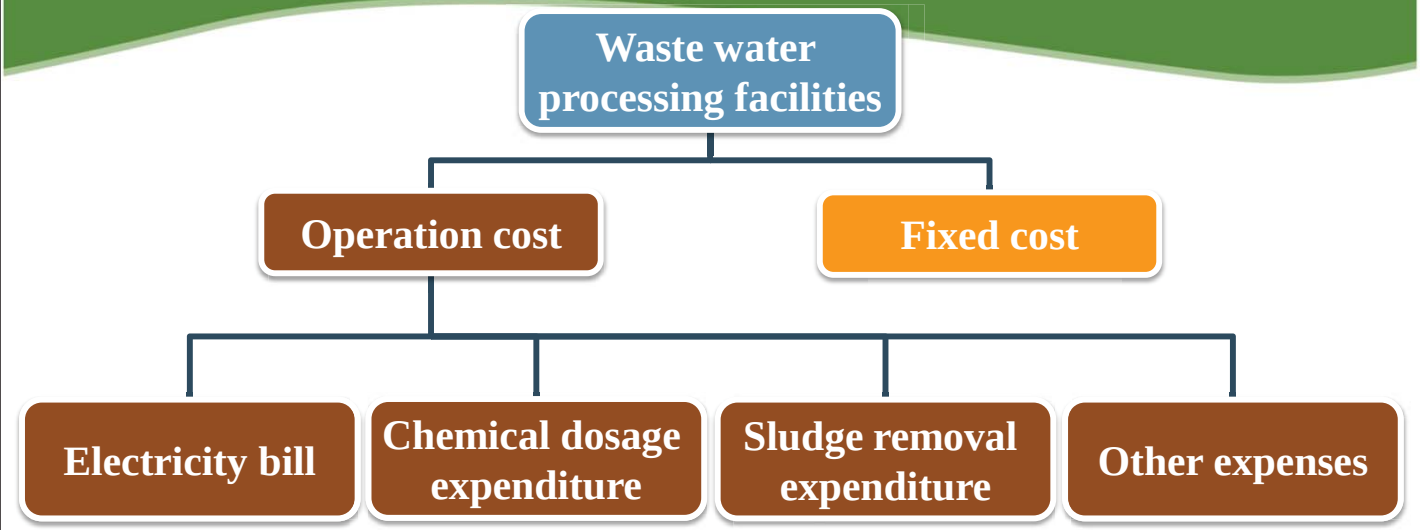
# Mass Flow

- Water usage, chemical dosage, and sludge production



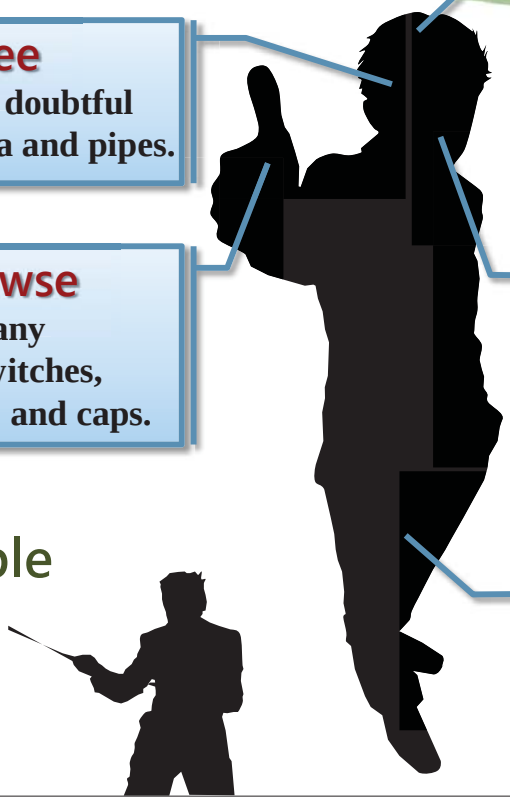



# Cash Flow




- Relevant receipts should be preserved (Business Accounting Law of Taiwan). Generally, there should be bills of purchase, examination lists and receipts

# Experience：5 Approaches



**See**
Observing doubtful phenomena and pipes.

**Browse**
Checking any possible switches, documents and caps.

**Think**
Developing inspection strategies to find out the truth and acquire the cooperation of enterprises.

**Ask**
Asking whatever is needed to explore the truth.

**Walk**
Inspecting along the processing flow/pipe of waste water and sludge.

- To discover possible, usable and doubtful evidences



# C P R

- Collect potential, doubtful, usable evidences

Copy

Picture

***Preserve the Evidence***

Record

Sign & File

# Inspection Tools

- Ex-ante Proposal：brainstorming, drill
- Working Note：analyze the issue and record it instantly
- Mechanic Instrument：automatic scientific analysis

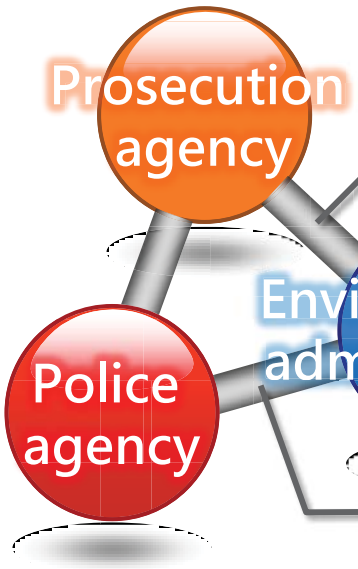


# Calculate & Trace Illegal Benefit Back

Legal Penalty, Monetary Penalty < Illegal Benefit

- **Taking samples and making appeals are no longer a big threat to enterprises**
- **Many enterprises dispose waste and emit pollution at night or through concealed pipes, believing that they can get away with such illegal action**

# Coalition of Prosecution, Police and Environmental Inspection Authorities




- Combine administrative inspection with judicial investigation to enhance the strength of enforcement, and consolidate the criminal evidences

- Screening the targets with high risk of illegal or pollution hotspots
- Using technological inspection tools to provide the scientific and numerical evidences

- Through the police authorities to monitoring for criminal offenses, search and seizure of evidences
- Sharing the information to further find the other related crime



Types of Non-Compliance

Environmental Law Enforcement Strategies

**Case Example in Taiwan**

Conclusion

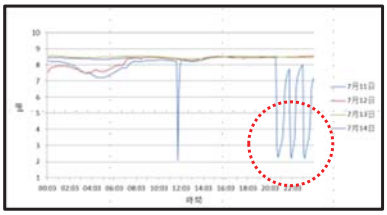
# Case Example in Taiwan

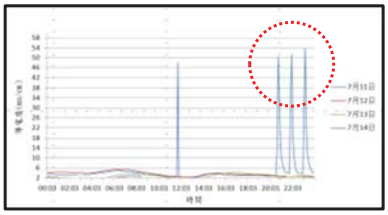
- During inspection of the hot-spot and area of water pollution, we found some doubtful pipes



# Case Example in Taiwan

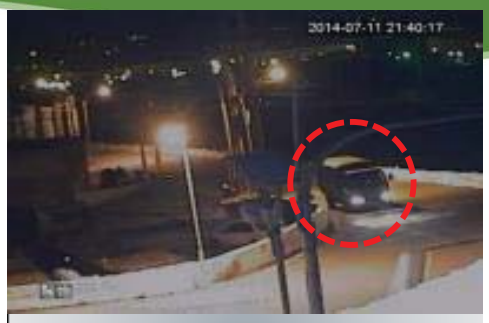
- Sampling and setting continuous monitoring instrument
- The water quality have certainly been abnormal at night in the period





# Case Example in Taiwan

- Investigated and monitored around through police authorities
- Traced the pipes by deep inspection
- Finally, we found the illegal enterprises with specific evidences




Monitoring doubtful vehicles

Coalition of prosecution, police and Environmental authorities



# Case Example in Taiwan


- Screws surface clean and treatment process, which produce acidic wastewater
- Convey to illegal relay station and discharge into river without treatment and permission

# Case Example in Taiwan

- The person in charge and other related criminals have been sued by prosecutor
- Cause the serious offenses, this factory has been claimed to shut down immediately and traced the illegal benefit back
- The illegal benefit（un-treatment benefit） is over 15 millions NTD by calculating



# Case Example in Taiwan

- Since 2011, the mode we cooperate with prosecution and police agencies has already been run for more than 1,000 cases now

Types of Non-Compliance

Environmental Law Enforcement Strategies

Case Example in Taiwan

**Conclusion**



- Advance inspection skills


- Penalize illegal benefit

- Strengthening bond between prosecution, police and environmental inspection authorities


THANK YOU !

附錄24、寮國專家Ms. Soudavee Keopaseuth「寮國綜合空間規劃之執行情形」簡報

# Integrated spatial planning (ISP) in Lao PDR

Ms. Soudavee keopaseuth, Department of Environment Quality Promotion, MONRE

# Legislation

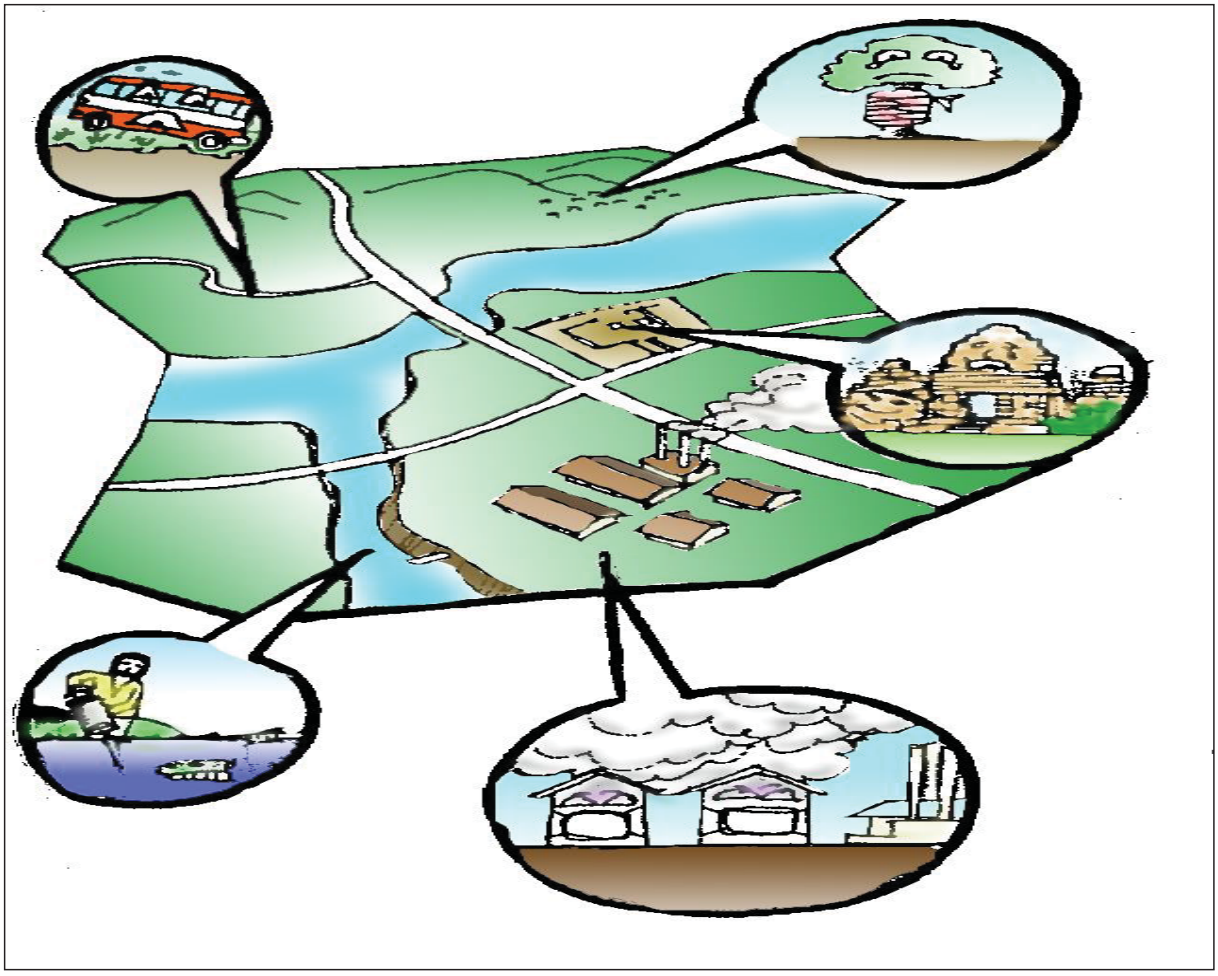
**Environmental Protection Law (Revised Version) approve in the year 2012:**

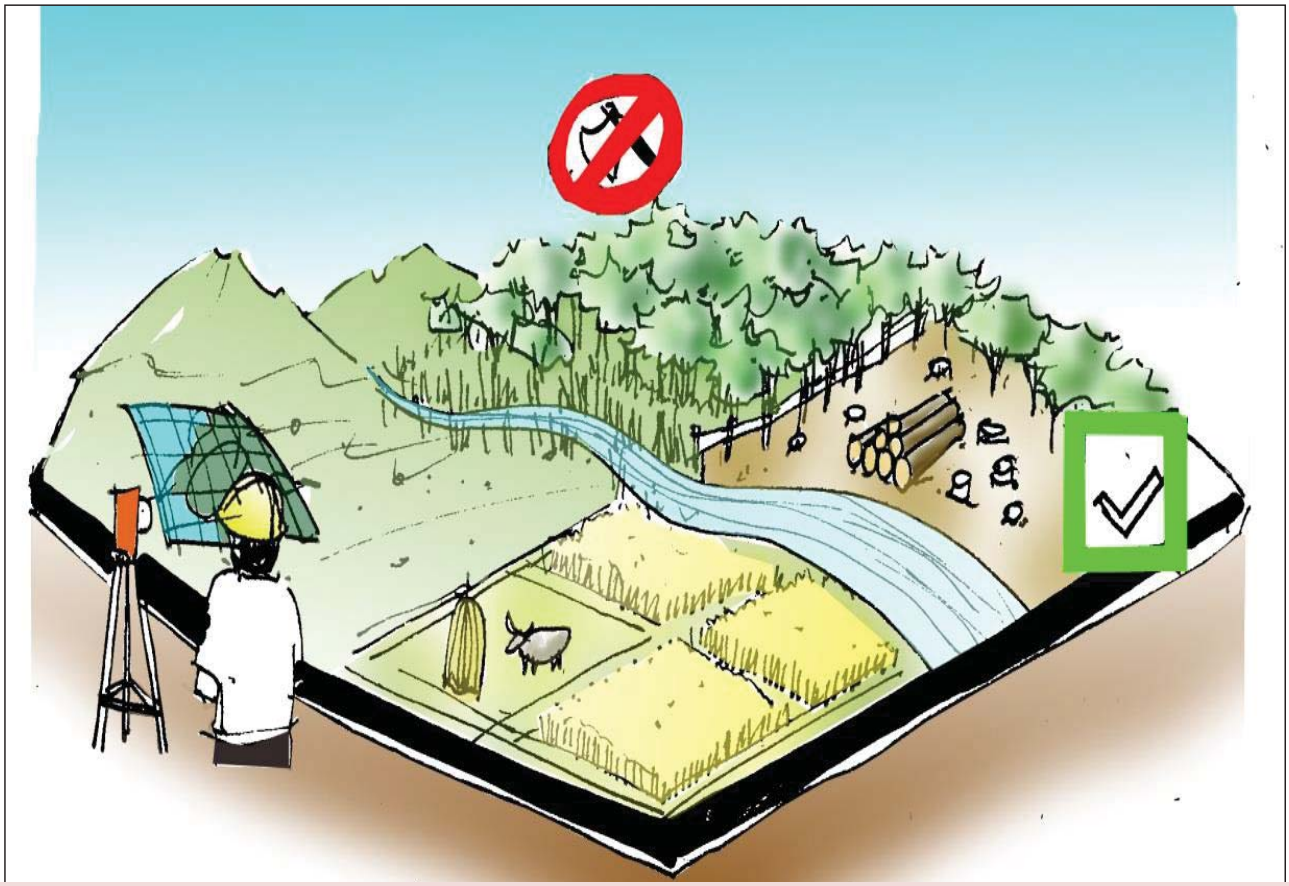
- Amended Environmental Protection Law includes a provision on Integrated Spatial Planning

**Article 18 Integrated Spatial Planning**

To ensure environmental protection, Integrated Spatial Planning (ISP) shall:

- Identify sustainability of natural resource use plans and land use plans in accordance to the national land use master plan;
- Manage natural resources and environment in areas, particularly residential, agricultural and future industrial sites or locations, and large scale investments; and
- Develop standards and rules on demarcation and zoning of areas as mentioned in the above paragraph 2.





ISP is a Regulatory and Transparent Tool Sets the framework for the desired development Prevents undesired development

# ISP PROCESS

**Issues and Potentials**

- Data collection
- Analysis
- Assessment of current situation and trend

**Vision and Strategies**

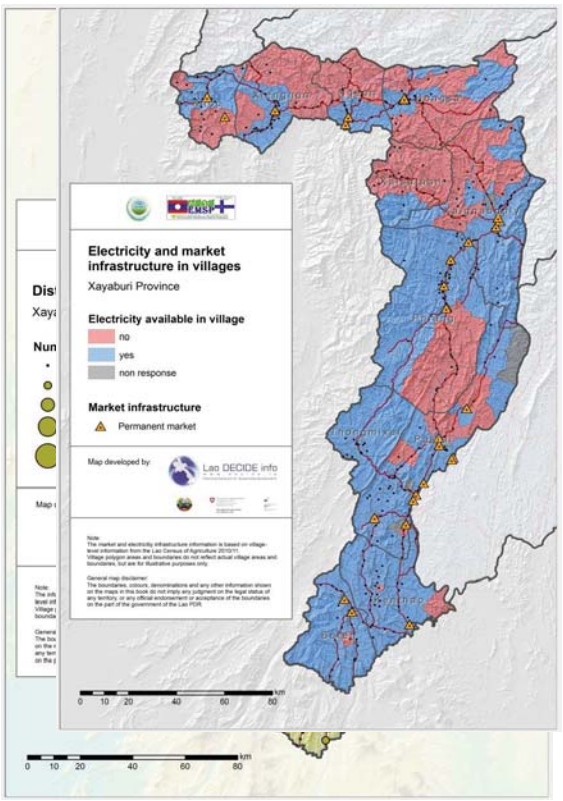
- SWOT
- Potentials
- Requirements
- Impacts +/-
- Assessment

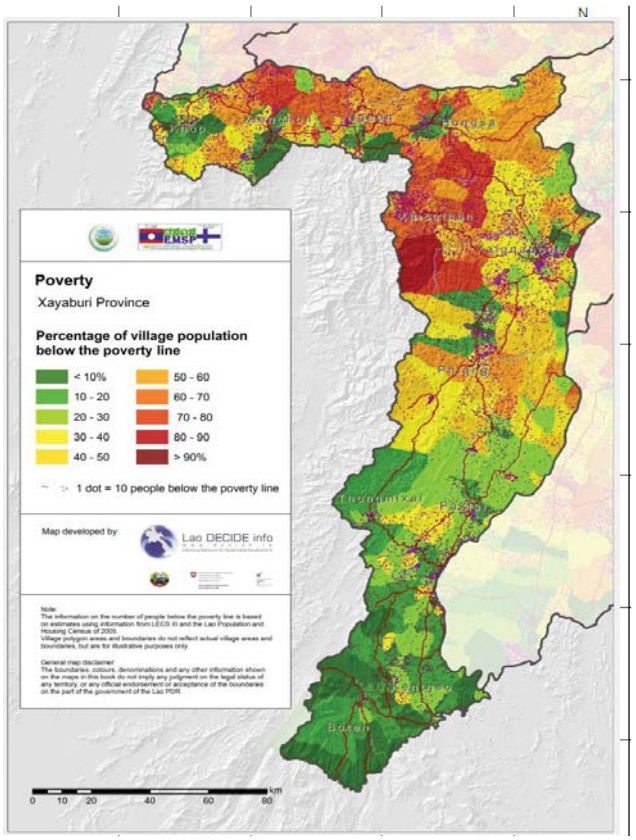
**Thematic Planning Maps**

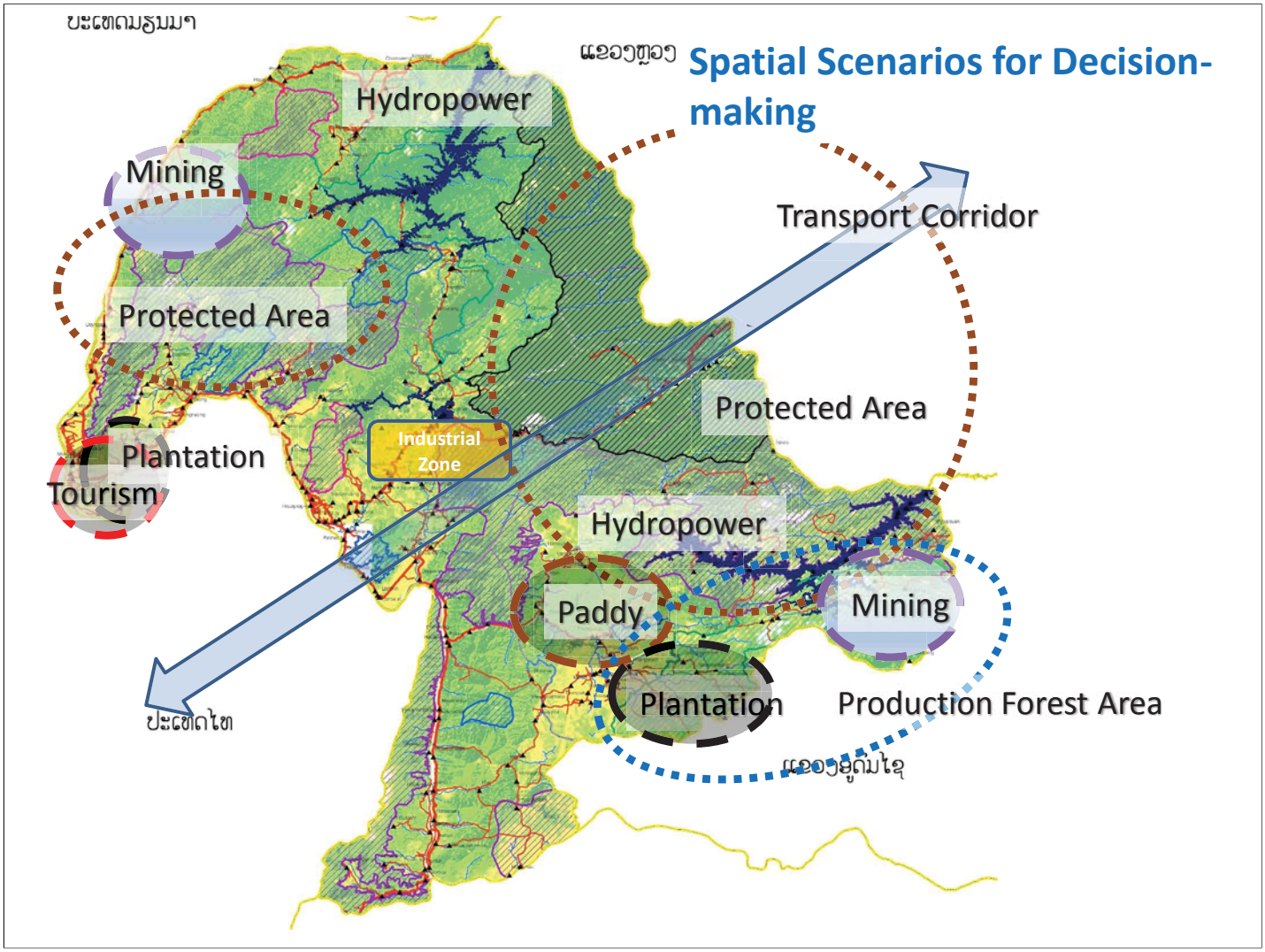
**Measures and Interventions**

- Integration
- Mitigation
- Co-benfits
- Action Plans

## Socioeconomic and Environmental Analysis






# Benefits and Challenges

- Brings concerned organizations together in one forum
- Help understand our available resources, our needs and constraints
- Displays scenarios for decision-making towards sustainable development
- Strategies and plans based on the real situation and available resources
- Requires capacity in different fields (data analysis and strategy formulation)
- Relies on good coordination and involvement of all concerned government departments
- Time and costs and expert assistance

# Conclusion

- An Integrated Spatial Plan is a strategic framework for development and environmental protection
- ISP can help to maximize the use of resources while developing strategic measures that will guard against potential impacts
- Province now has a plan aiming to maximize its strategic location in northern Lao PDR and attract needed investment and development assistance while protecting its environment and natural resources
- Using ISP will ensure each project is better planned and designed, that it forms part of an overall development plan for the province, district and country and that it carefully considers and addresses environmental impacts

# THANK YOU

# WAY FORWARD

- ISP is in the EPL but there is a need to develop an ISP Decree with focus on alignment and incorporation in the whole planning system, allocation of roles and responsibilities and the function of ISP
- High level support for ISP is essential
- ISP should be anchored at the Provincial Governor's Administration with the DPI as the coordinating body and DONRE as the technical body
- The ISP should serve as a long term master plan for the SEDP and Provincial Sector Plans
- Continued training of staff from all concerned sectors on ISP analysis and implementation
- Continued awareness raising on ISP at national, provincial and district levels

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM


# Using Innovative Tools to Monitor Environment in the GMS

## Content

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

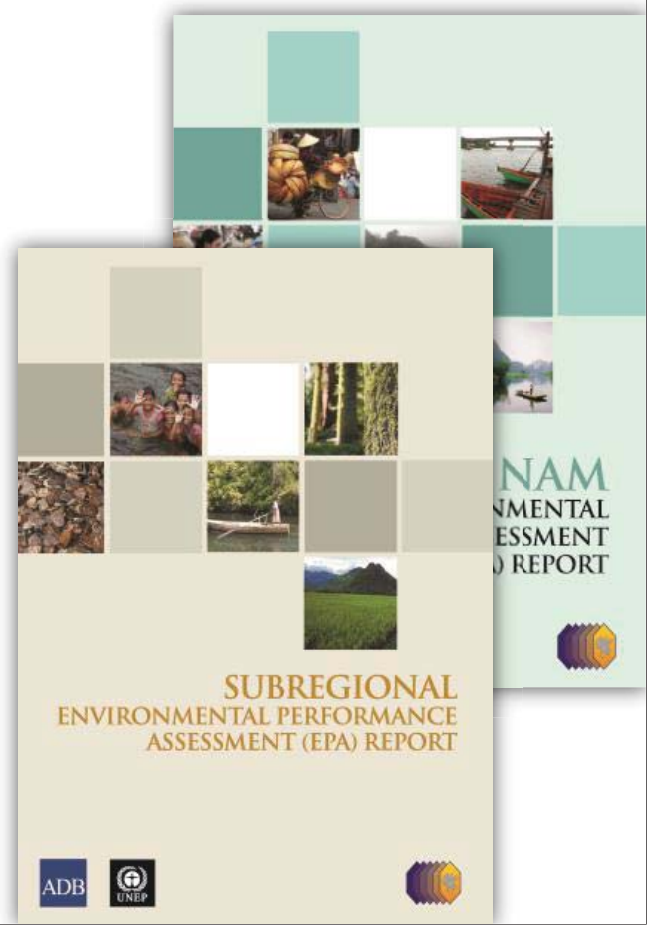
1. History
2. Lessons learnt
3. The GMS Online Environmental Platform
4. Using the data to improve environmental management in the GMS

# History (1/2)

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

## 2003-2005: Strategic Environmental Framework Phase II

- Introduced Environmental Performance Assessment
- Built capacity on P-S-R indicator development
- Piloted GLOBIO model (GMS biodiversity pressure map)
- First round of EPA reports published

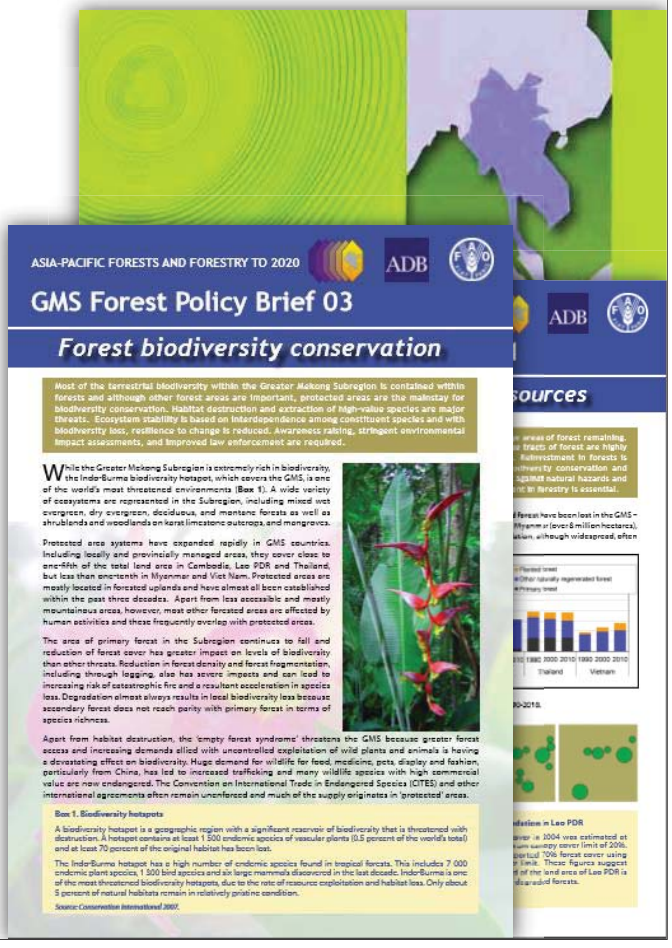



# History (2/2)

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

## 2006-2011: Core Environment Program Phase I

- Lead by governments
- Deepened EPA capacity
- Shifted from P-S-R to D-P-S-I-R framework
- Supported selective assessments (FAO Asia-Pacific Forest Sector Outlook)
- Second round of EPA reports published



# Content

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

1. History
2. Lessons learnt
3. The CEP Regional Information Platform
4. Using the data to improve environmental management in the GMS

# Challenges

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

- Data gaps and quality
- Lengthy approval process of report
- Data old by time of publishing
- Reports 5 years apart
- EPA process not formalized
- Should improve SOE rather than position as separate process

## Responses

- Focus and invest in monitoring data (not report writing)
- Cover both statistical and spatial data
- Aim for annual update of data (stats)
- Organize data into central database
- Disseminate through website in ready-to-use format (interactive charts)

## Content

1. History
2. Lessons learnt
3. The CEP Regional Information Platform
4. Using the data to improve environmental management in the GMS

# Knowledge Hub

1. Easy, online access to monitoring data (no need to sign in, no need to interact with EOC staff)
2. Adjusted to different user skills and needs (raw data, interactive charts, ready-made maps)
3. Explores new, innovative monitoring formats (incl. web-maps, qualitative indicators, geo-journalism)


# Knowledge Hub

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

Functions summarized

**Statistics Portal**

**Map Portal**

**Library News Events**

- 80 indicators at 4 geographic levels (region, country, landscape, biodiversity site)
- Displayed as interactive, customizable charts,
- All data downloadable as table for further use
- Geo-tagged Impact stories with photos
- Customizable factsheets, save / edit, print PDF
- Mobile version

# Knowledge Hub

Functions summarized

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

Statistics Portal

Map Portal

Library News Events

- 3 tiers targeting different needs and levels of expertise
  - Ready products
  - Interactive tools allowing for customization
  - Raw data for maximum flexibility in own analysis
- No need for registration / login to access data
- Increasingly used as platform by other organizations to host / share their data (SEA START, ESA, Mekong ARCC)


# Knowledge Hub

Functions summarized

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

Statistics Portal

Map Portal

Library News Events


- Hosts CEP publications as well as materials relevant to CEP
- User rights management allows for users to submit documents into library
- Calendar of events on environment from a wide range of actors
- News ticket, newsletter, social media to reach out (and draw in) partners and public

# Demonstration

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

Statistics Portal — www.gms-eoc.org/gms-statistics

Map Portal — www.gms-eoc.org/gms-mapping

Library News Events — www.gms-eoc.org/online-library

# Content

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

1. History
2. Lessons learnt
3. The CEP Regional Information Platform
4. Using the data to improve environmental management in the GMS

# Improving Pollution Control

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

Example of Lao PDR

Rapidly growing industrial development, in particular manufacturing industry, but:

- Often not using most recent / clean technologies (risk)
- Concentrated in areas with high population (exposure)
- Pollution control lacks data to identify key sectors and locations to focus limited funds and staff
- Potential to use the Industrial Pollution Projection System

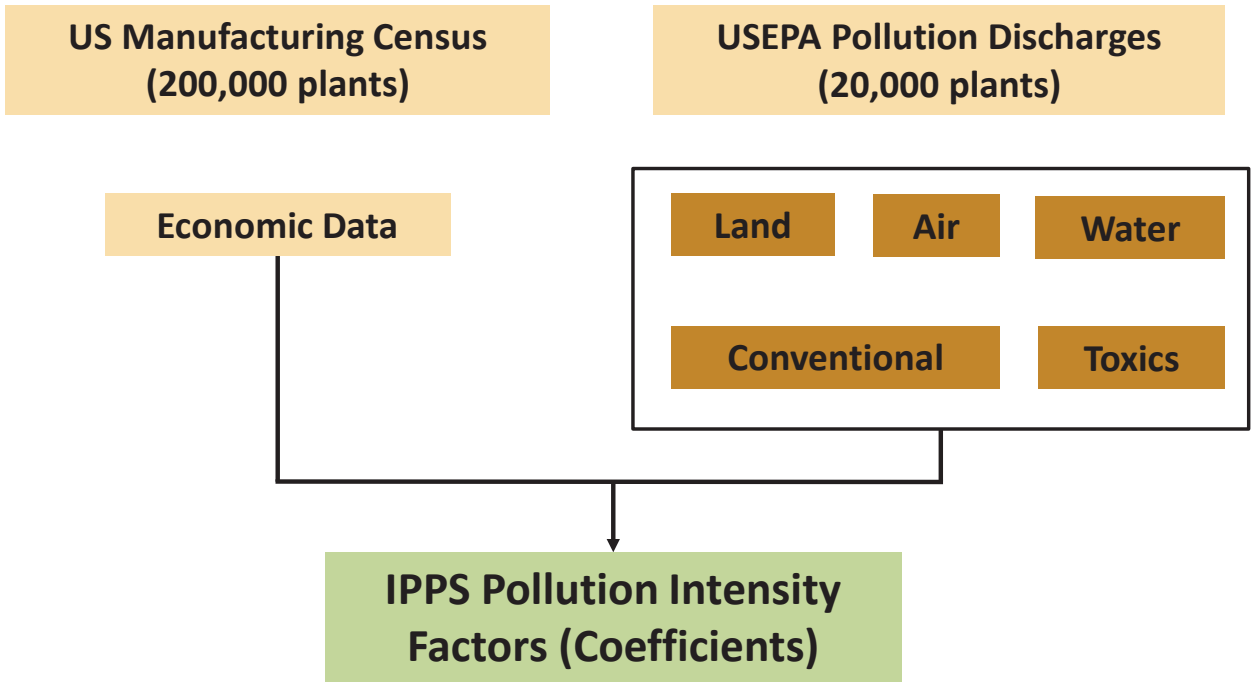
IPPS estimates 14 key pollutants:

- SO2
- NO2
- CO
- VOC
- PM10
- TSP
- BOD
- TSS
- Toxic Metals to Air
- Toxic Metals to Land
- Toxic Metals to Water
- Toxic Pollutants to Air
- Toxic Pollutants to Land
- Toxic Pollutants to Water

# IPPS explained

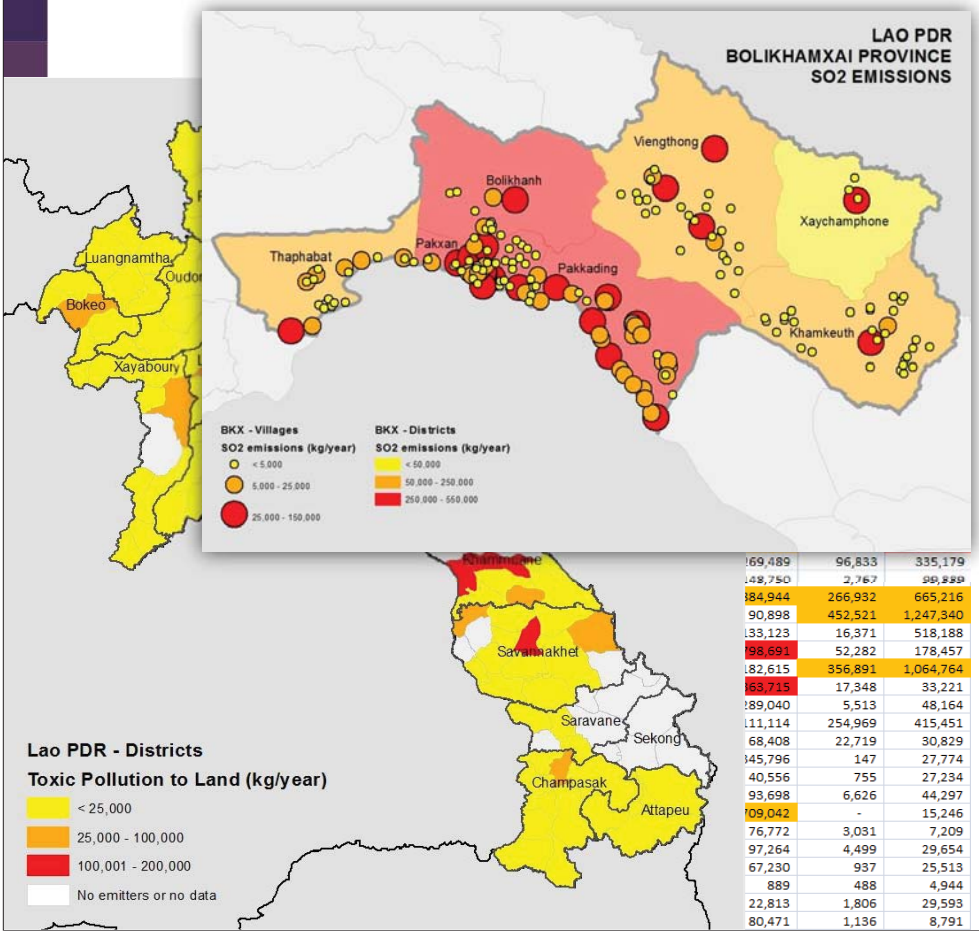
GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

How pollution coefficients were developed



# Results

GREATER MEKONG SUBREGION
CORE ENVIRONMENT PROGRAM



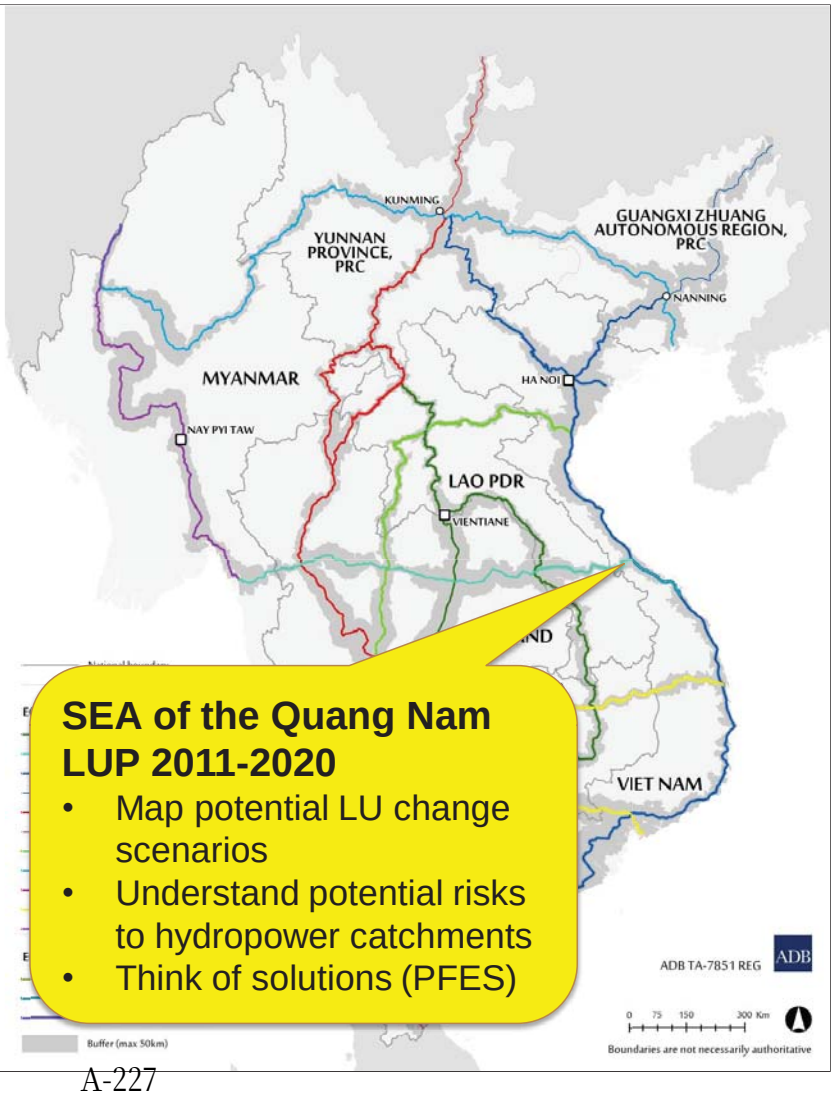

| | | |
|---|---|---|
| 69,489 | 96,833 | 335,179 |
| 48,750 | 2,767 | 99,339 |
| 84,944 | 266,932 | 665,216 |
| 90,898 | 452,521 | 1,247,340 |
| 33,123 | 16,371 | 518,188 |
| 98,691 | 52,282 | 178,457 |
| 82,615 | 356,891 | 1,064,764 |
| 63,715 | 17,348 | 33,221 |
| 89,040 | 5,513 | 48,164 |
| 11,114 | 254,969 | 415,451 |
| 68,408 | 22,719 | 30,829 |
| 45,796 | 147 | 27,774 |
| 40,556 | 755 | 27,234 |
| 93,698 | 6,626 | 44,297 |
| 09,042 | - | 15,246 |
| 76,772 | 3,031 | 7,209 |
| 97,264 | 4,499 | 29,654 |
| 67,230 | 937 | 25,513 |
| 889 | 488 | 4,944 |
| 22,813 | 1,806 | 29,593 |
| 80,471 | 1,136 | 8,791 |

Can be used to *guide* pollution control authorities

Should *support* ground measurements and enforcement, *not replace* them

← Air pollution by activity

# Development means LUC…



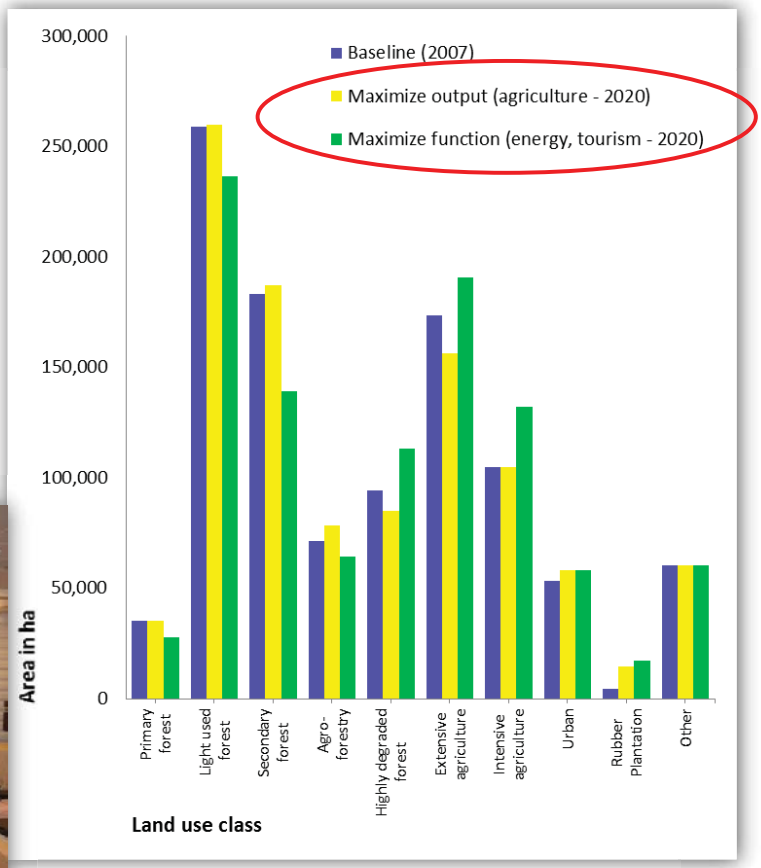

**SEA of the Quang Nam LUP 2011-2020**

- Map potential LU change scenarios
- Understand potential risks to hydropower catchments
- Think of solutions (PFES)

# Scenario development

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

- Past trends?
- Economic projections?
- Sector demands?
- National targets?
- Int. commitments?
- Aspirations? Goals?




# CLUE Model

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

Components (simplified)

**1. Land Use, Ecosystem Service demand** (from past trends, sector scenarios)

**Non-Spatial components**

**2. Conversion Settings** (What can convert into what?)

**Land Use Allocation Procedure**

**3. Location Characteristics** (explanatory factors, suitability)

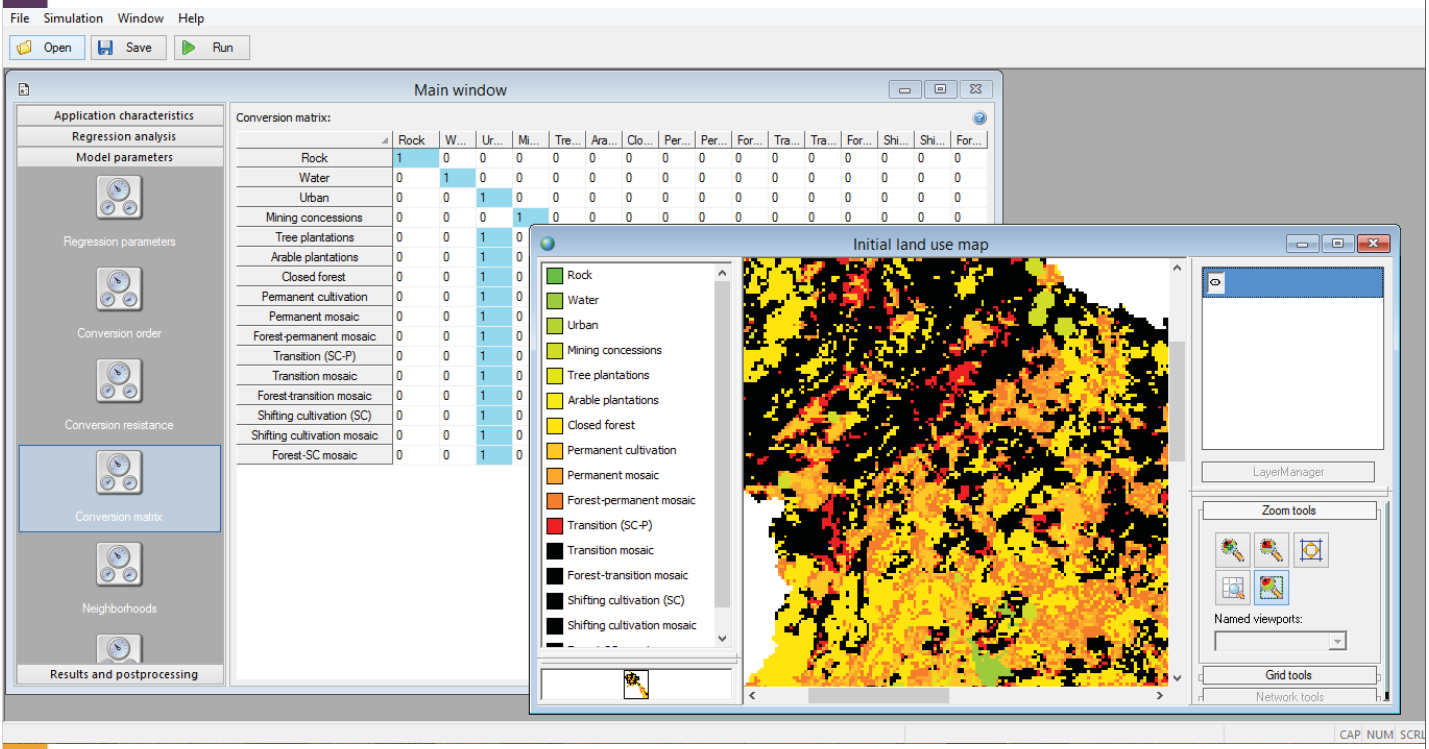
**Spatial components**

**4. Spatial Policies and Restrictions** (e.g. Protected Areas, Tenure etc.)

# CLUE Model

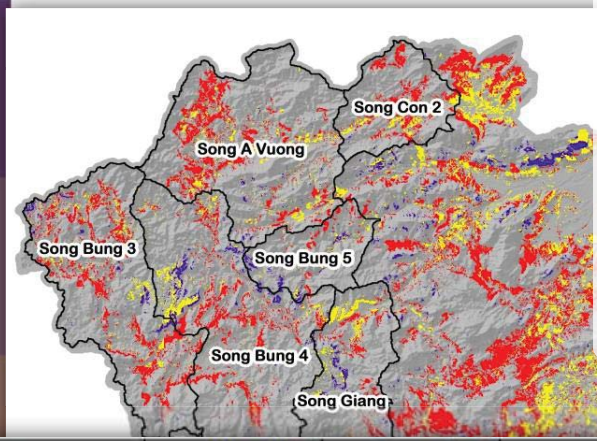
## Model interface

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM




# Results

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM




- Facilitated cross-sector discussion
- Agriculture targets reviewed
- Critical catchments and biodiversity sites excluded from land re-allocation

| Dam | Area (ha) | Scenario 1 | % | Scenario 2 | % |
|---|---|---|---|---|---|
| Song Con 2 | 24,099 | 1,197 | 5% | 4,28 | 18% |
| Song A Vuong | 68,496 | 2,543 | 4% | 10,059 | 15% |
| Song Bung 5 | 19,836 | 988 | 5% | 1,229 | 6% |
| Song Giang | 41,462 | 2,411 | 6% | 4,074 | 10% |
| Song Bung 4 | 82,592 | 4,237 | 5% | 8,103 | 10% |
| Song Bung 3 | 63,049 | 2,483 | 4% | 9,281 | 15% |
| Dak Mi 1 | 2,223 | 40 | 2% | 28 | 1% |
| Dak Mi 4 | 34,217 | 677 | 2% | 2,999 | 9% |
| Dak Di 4 | 45,919 | 6,285 | 14% | 7,224 | 16% |
| Song Tranh 2 | 60,056 | 2,161 | 4% | 7,697 | 13% |
| ***Total*** | ***441,949*** | ***23,022*** | ***5%*** | ***54,974*** | ***12%*** |

n contained
uthoritative.

# Outcomes

GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

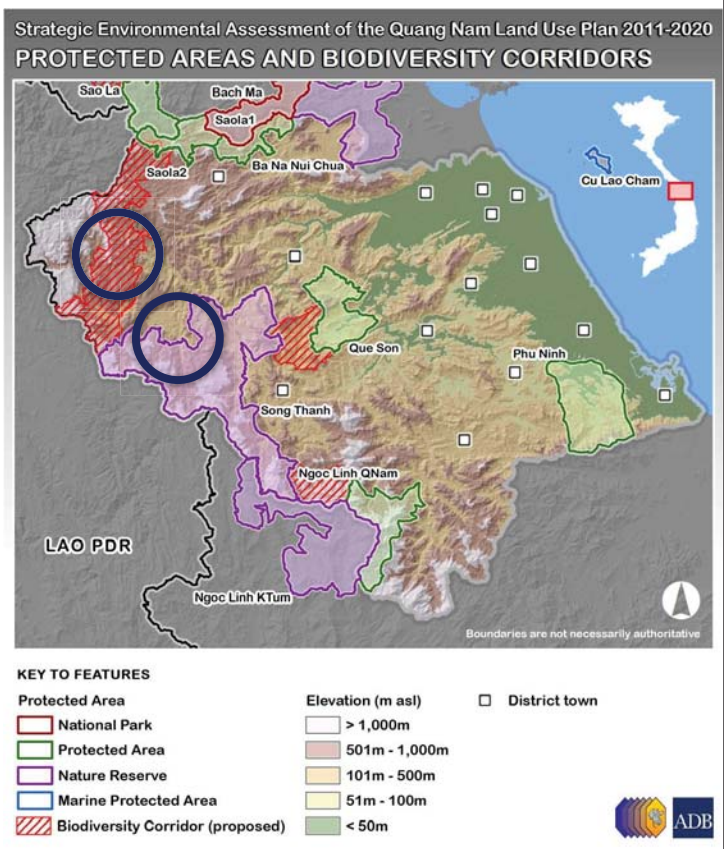
## Investments protected

**Song Bung 4:**

- 196m US$ investment
- Agricultural intensification could halve conversion

**Biodiversity Conservation Corridors**

- 20m USD$ investment
- 38 communes of forest dependent ethnic minorities included
- PFES fund allocation improved




GREATER MEKONG SUBREGION CORE ENVIRONMENT PROGRAM

# Thank you!

Don't forget to visit:

www.gms-eoc.org

www.gms-eoc.org/gms-mapping

www.gms-eoc.org/gms-statistics

www.gms-eoc.org/online-library