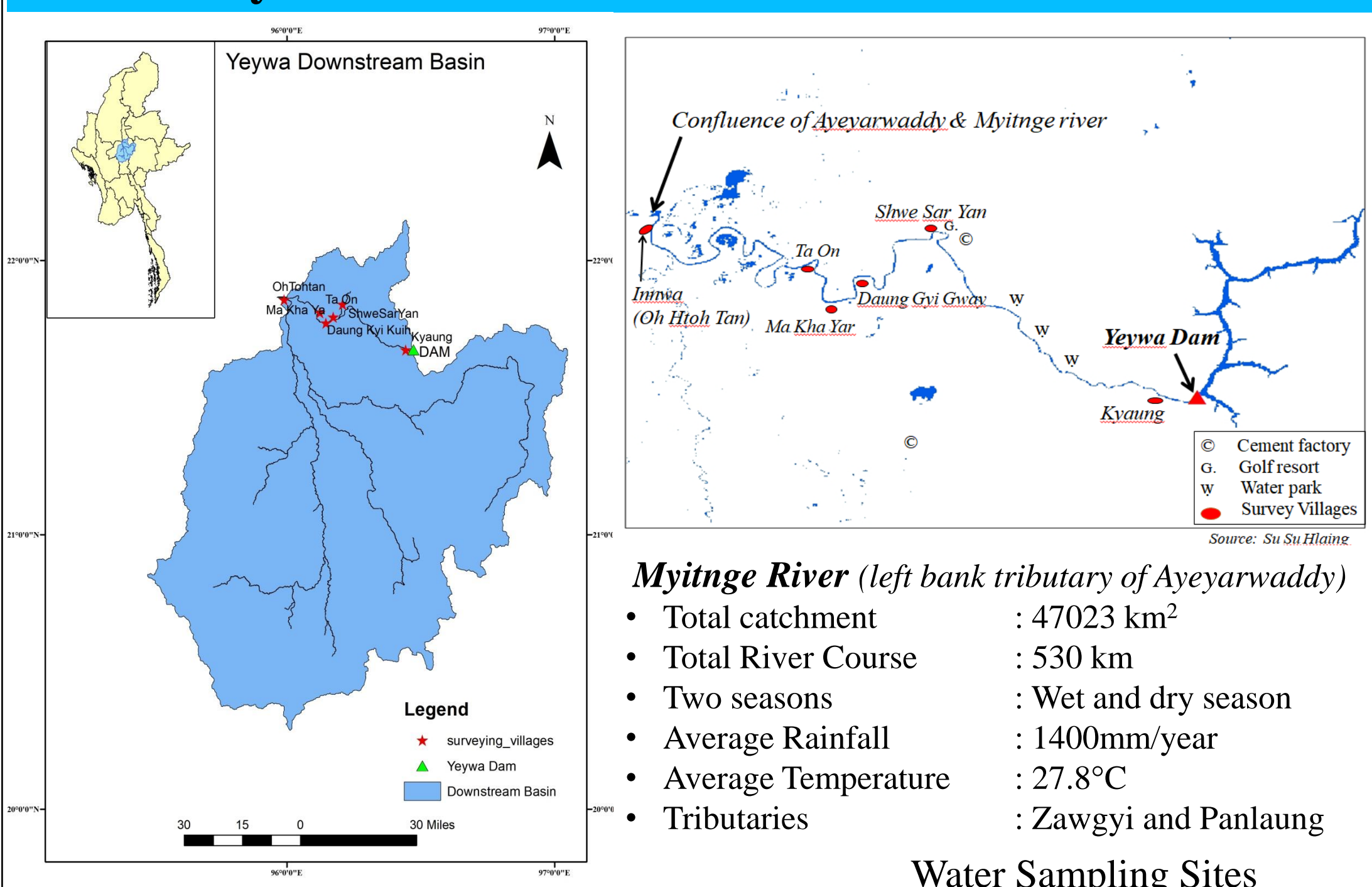


## Introduction

- Hydropower development and irrigation projects are the major works of water resources development in Myanmar.
- Although dams are constructed for multi uses, these can also cause the hydrological alteration of river which can impact on the river ecosystem providing a wide range of services to human.
- With 4 million inhabitants, Myitnge river is under influence of various human activities.
- The aim of this paper is to study basic information about the ecosystem services whether the important ecosystem services consumed by the local people, river water quality and other environmental resources in the downstream area were affected by the hydropower plant which is constructed at the river upstream.

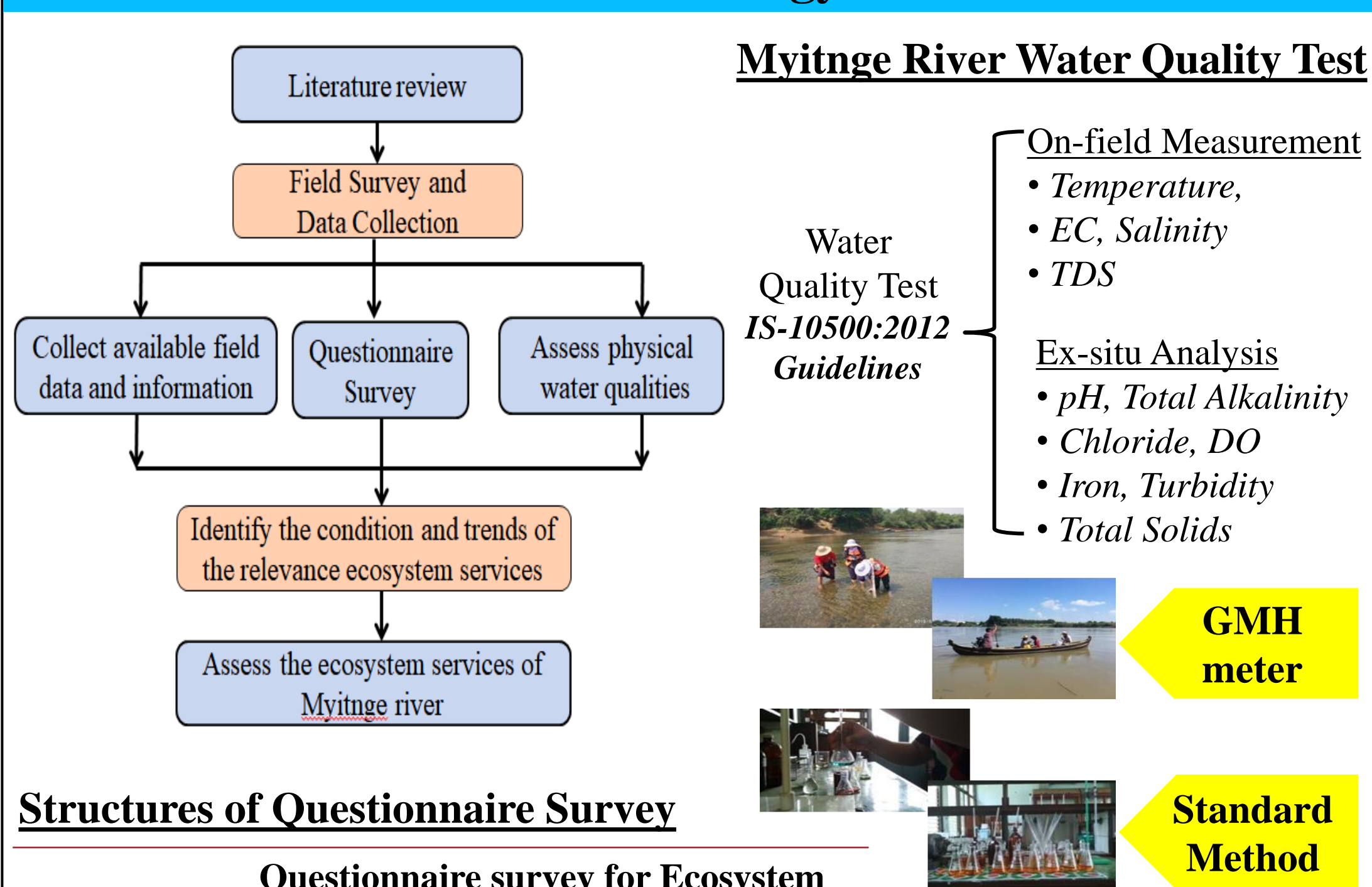
## Case Study Area



### Selected Villages for Questionnaire Survey

- Kyaung
- Shwe Sar Yan
- Daung Gyi Gway
- Ma Kha Yar
- Ta On
- Innwa (OhHtotTan)

## Materials and Method Methodology



Age	25-66
Gender	23 Male, 13 Female
Occupation	21 Farmers, 4 Traders, 2 Retired, 3 Civil Service, 2 Dependent, 1 Boatman, 1 Worker, 2 Carpenter



## Data Collection

Data	Sources
Background of the Study Area, Water Quality Results (pre dam)	Myanmar Information Management Unit (MIMU) Myanmar Electric Power Enterprise (MEPE)
Land Use Data	SERVIOR Mekong Land Cover Portal
Water Quality Results(Post dam)	Field Survey
ESA of Myitnge River	Questionnaire Survey

## Result and Discussion

### Questionnaire Survey Result

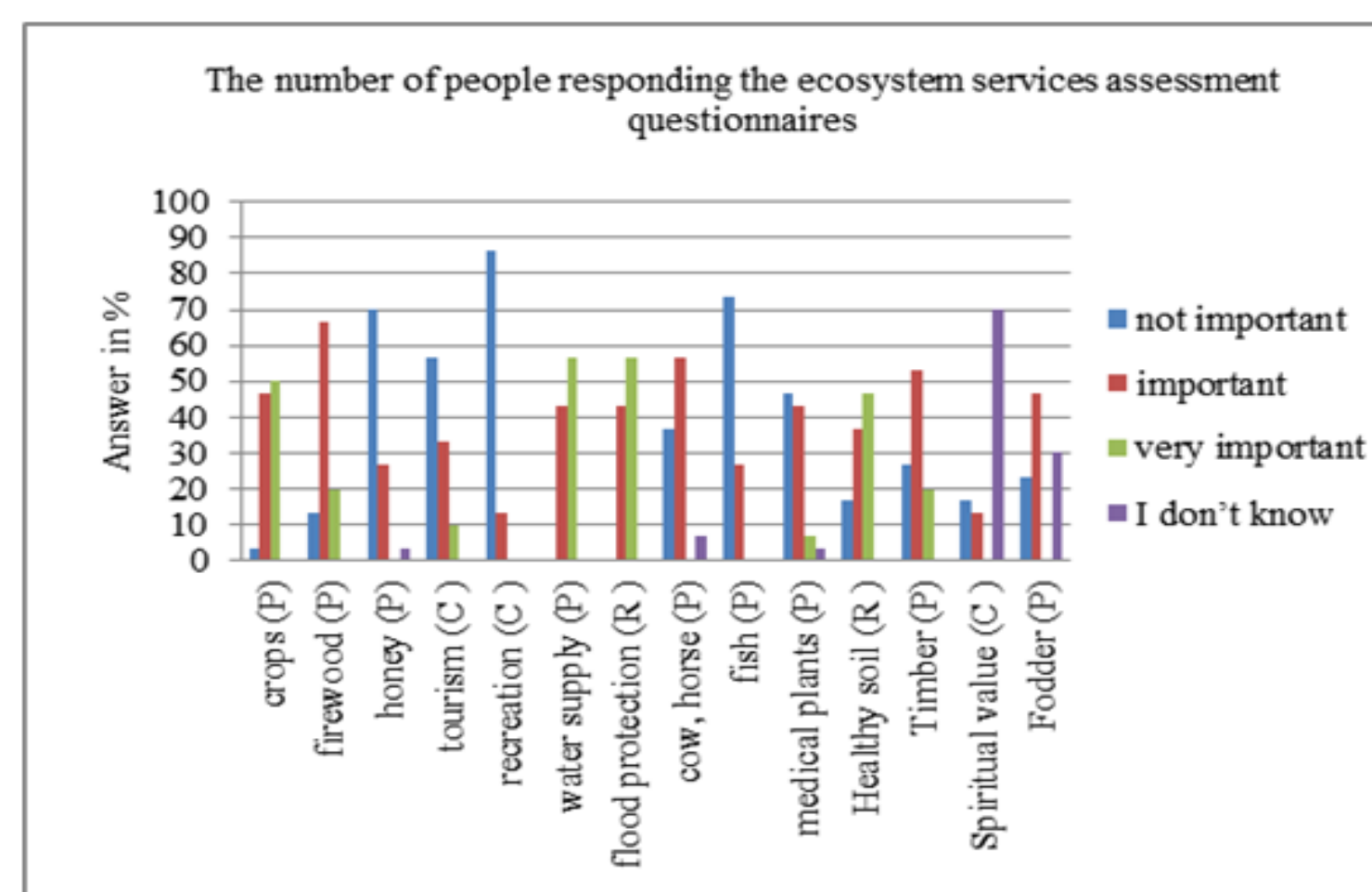


Figure. People responding the questionnaires survey of the importance of ecosystem services

### Provisioning Services

Freshwater  
Crops  
Fire-woods

Fishery  
Cattle

Forestry products

### Regulating Services

Flood protection  
Healthy Soil

### Culturing Services

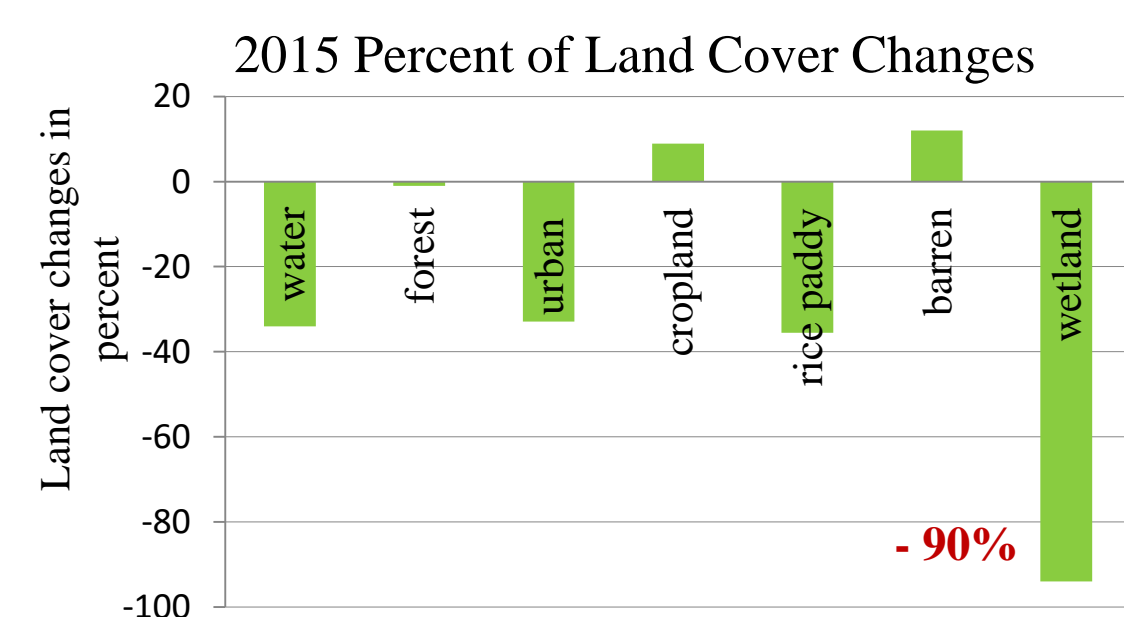
Recreation  
Tourism

### Comparison of Water Quality Test Results from Lower Myitnge River

No.	Parameters	IS 10500:2012	Unit	Before Dam		After Dam			
				Sample	Range	Point 1	Point 2	Point 3	Point 4
1	pH	6.5-8.5	-	26	6.5-8.5	7.9	8	8	8
2	Turbidity	1 - 5	NTU	25	0-20	2	6	4	2
3	Chloride	250~1000	mg/l	3	6-9	4	4	6	6
4	Total Alkalinity	200~600	mg/l	-	200-600	150	158	162	160
5	DO	6.6-8	mg/l	25	6.6-8	7.8	7.8	7.2	6.6
6	Total Solids	400	mg/l	-	-	244	260	270	222
7	Iron	0.3~1	mg/l	12	0.1-13.2	0.05	0.03	0.06	0.04
8	Temperature	-	°C	1	26.83	26.2	26.7	26.1	26.8
9	EC	700~3000	µS/cm	26	260-400	289	297	314	290
10	TDS	500~2000	mg/l	-	500-2000	284	297	312	297
11	Salinity	0.5	%	-	0.5	0.1	0.2	0.2	0.2

Source: MEPE, Field Survey

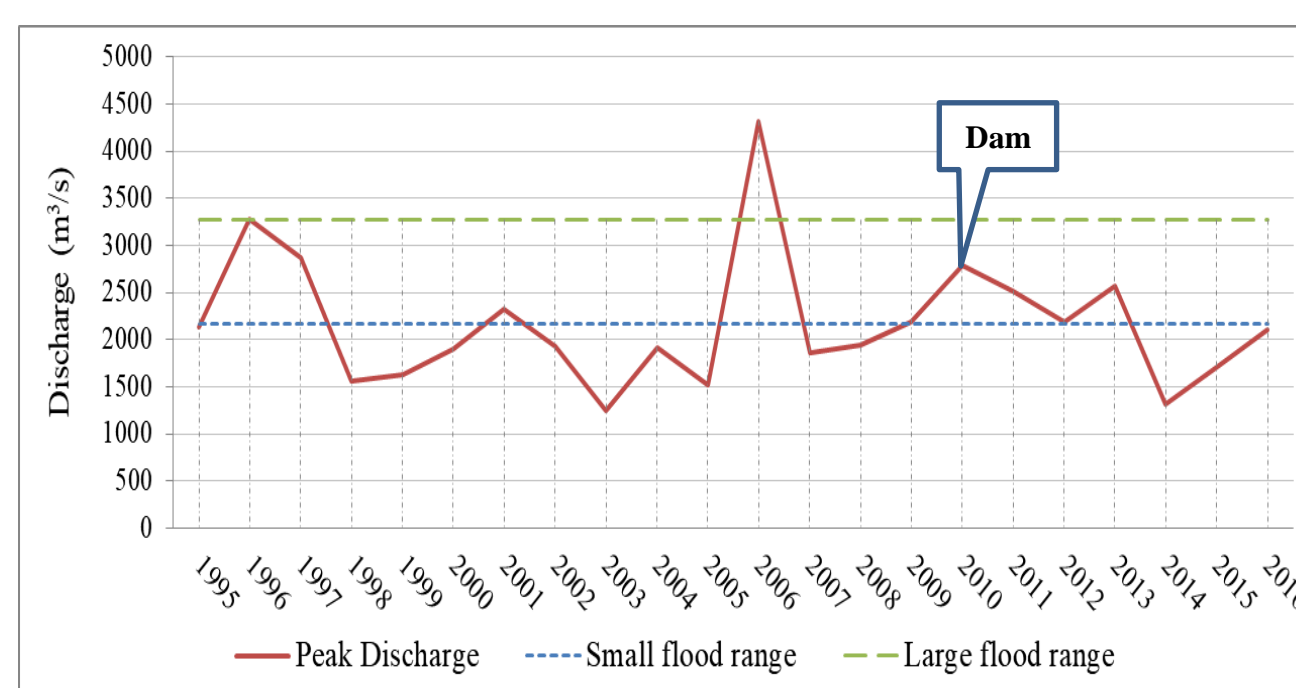
- For hydroelectric power generation, it does not contaminate the water quality but only thermal characteristic of the water body is altered, and no severe effect on water provisioning services.
- The river water is found to be closed to IS-10500:2012 Class (A) Standards, indicating that they can be used for drinking purpose.



### Data Assumption Periods

Pre dam year 2000  
Post dam year 2015

- Dam construction
- Decrease in total annual rainfall
- Decrease in daily discharge



Reduced flood frequency

Floodplains (Direct)  
Incomes of farmers, fishers & Employment (Indirect)

## Conclusion

- To sum it up, the local communities living along Myitnge river have high appreciation and dependence on provisioning and regulating services.
- Although damming has advantages of flood reduction and sediment loads retention, it reduced floodplain areas which have caused loss of livelihood for farmers as well as their use of lakes for fish culture at the downstream.
- It can be said that dam for hydropower generation has many benefits in socio economic for the users even though there are environmental impacts to some extent for the downstream areas.

## Recommendations

- Other users such as industries, sand dredging, mining, and recreational areas along the river bank which can also be water pollution sources in the future, should be controlled and monitored.
- In order to protect river bank cultivation and loss of wetlands and inns, the existing pumping water supply process should be developed and maintained.