Human Development of Small Scale Fishers in Indian Reservoirs: A Gender Based Assessment

Pooja Gautam
PhD Scholar
ICAR-Central Institute of Fisheries Education

"The objective of development must be viewed as a selective attack on the worst forms of poverty. Development goals must be defined in terms of progressive reduction and eventual elimination of malnutrition, disease, illiteracy, unemployment, and inequalities. The concerns for more production and better distribution should be brought together in defining the pattern of development."

Mahbub ul Haq in The Poverty Curtain, Columbia University Press, New York 1976

Reservoir fisheries and Human Development

- Inland fishing has a significant role in socio-economic improvement of the developing countries
- Reservoir fisheries assume substantial role in providing a vital source of protein as well as income for many families
- Most of the dams are located in remote areas where large number of people are tribal who are struggling for their daily livelihood
- Hence reservoir fisheries play very important role in improving their livelihood and socio-economic status

Purpose of Study

- Reservoirs being an important resource for fisheries development, the overall development of fishers dependent on it and importance of gender role is not well understood
- Study is an attempt to analyze the human development status of fishers dependent on the reservoirs and specifically understand the role played by both fisher men and women in fisheries related activities in Indian reservoir regions
- No suitable unified methodology for understanding development status of a particular occupational group at **Household level**
- Universally adopted macro-level indicators like HDI, GDI modified suitably to study the specific population groups (fishers, farmers) at the micro-level
- Comparison will be easy across as well as within the farming community

Study Objectives

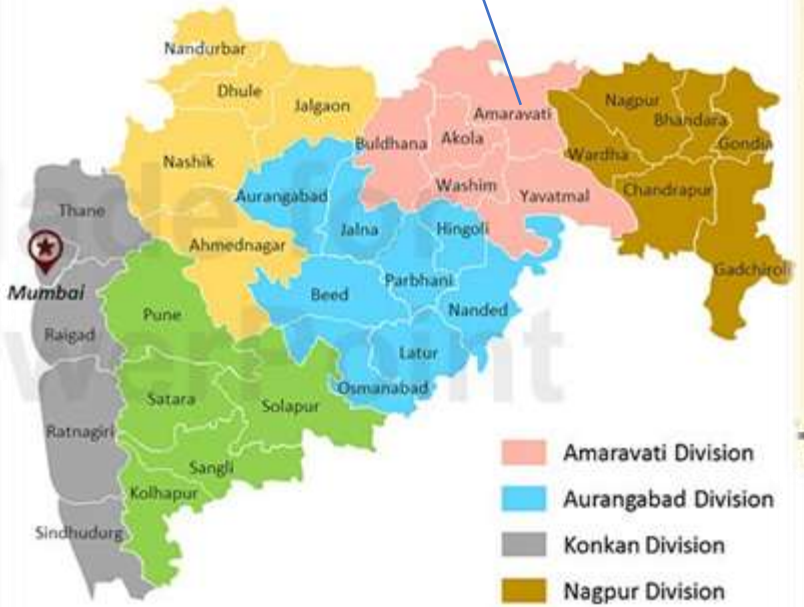
- To analyse the Human Development of fishers of Upper Wardha Reservoir, Maharashtra, India at House Hold level

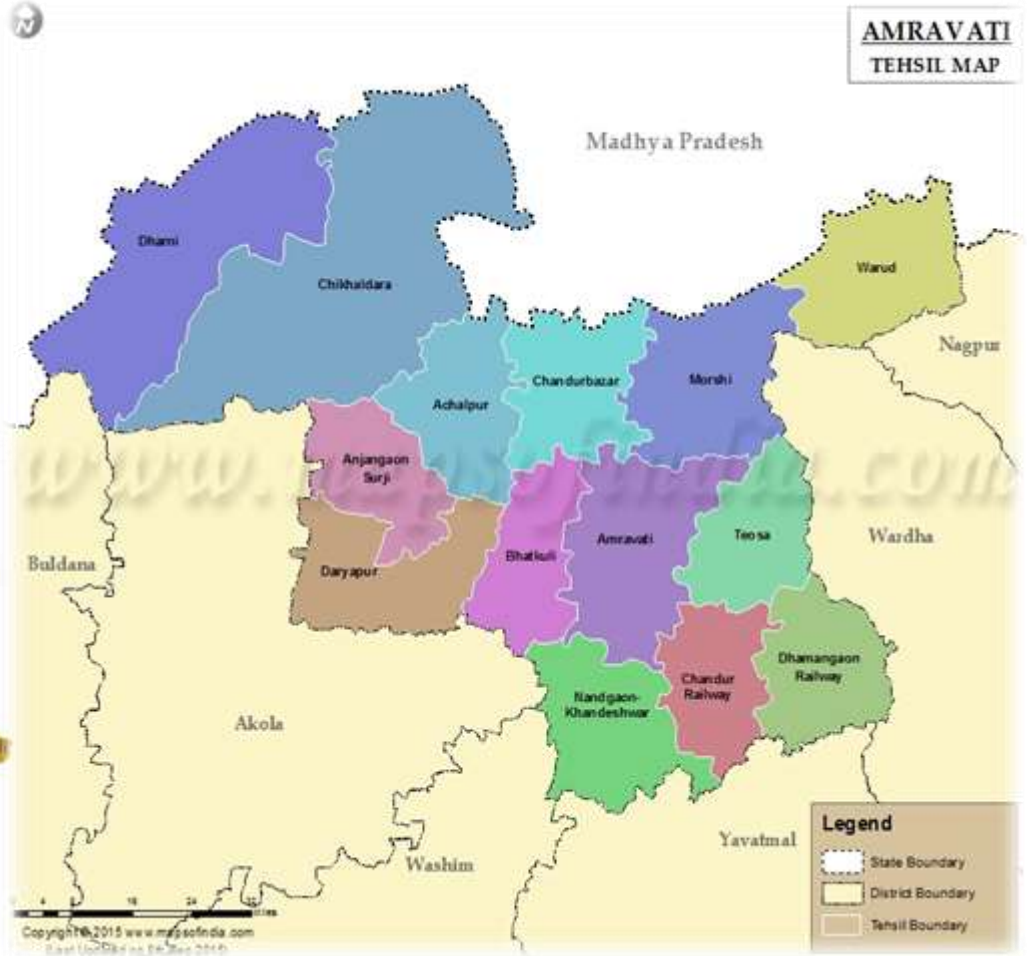
- To analyse the Gender Development of fishers and to understand the role played by both men and women in fisheries related activities in Upper Wardha reservoir of Maharashtra, India

Materials and Methods

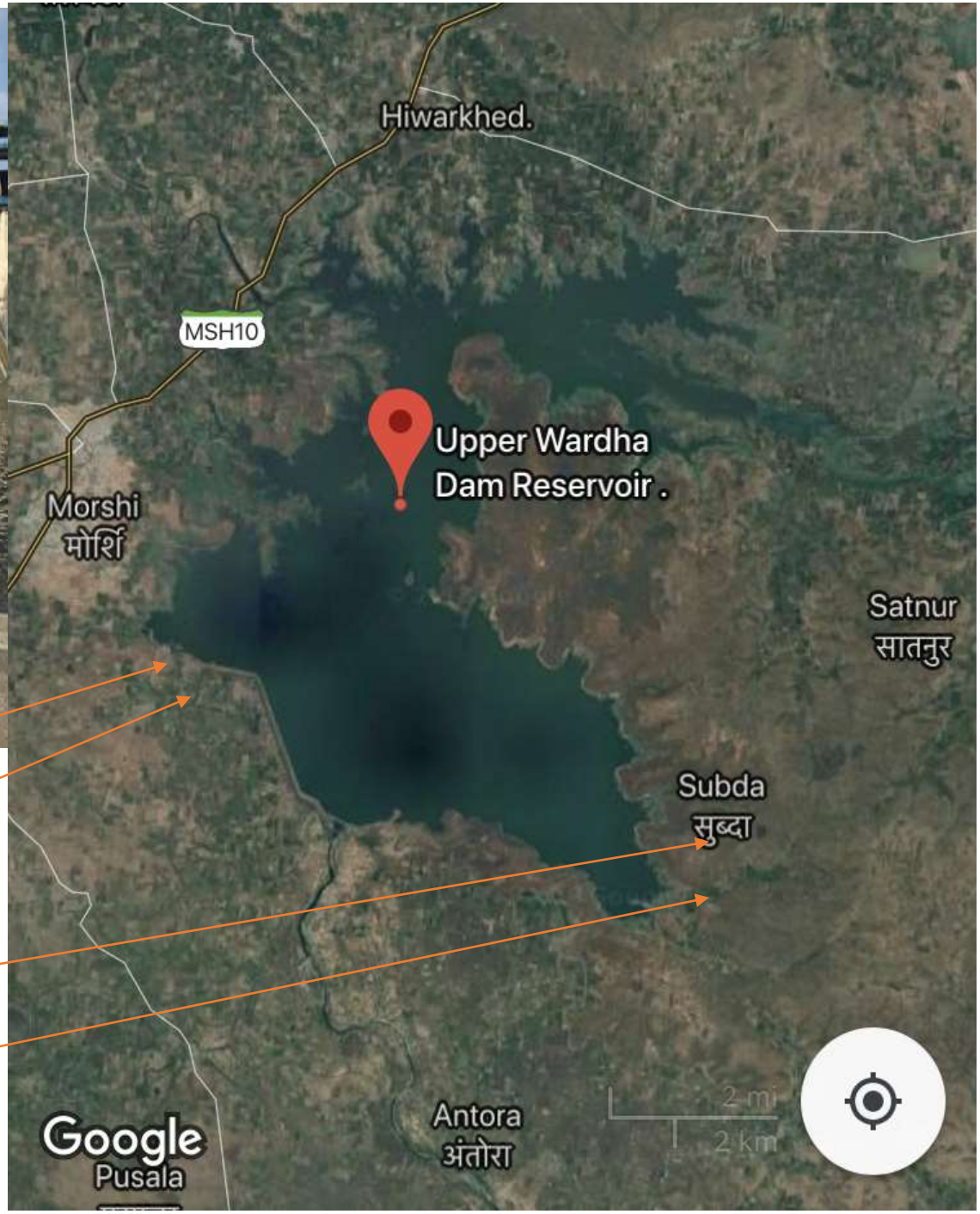
Maharashtra

Amaravati District





Locale of Study



Total no. of Households
100

- **Village 1 (n=25)**
- **Village 2 (n=25)**
- **Village 3 (n=25)**
- **Village 4 (n=25)**

Sample Villages and no. of fishers' households

Hydrographic features of Upper Wardha reservoir

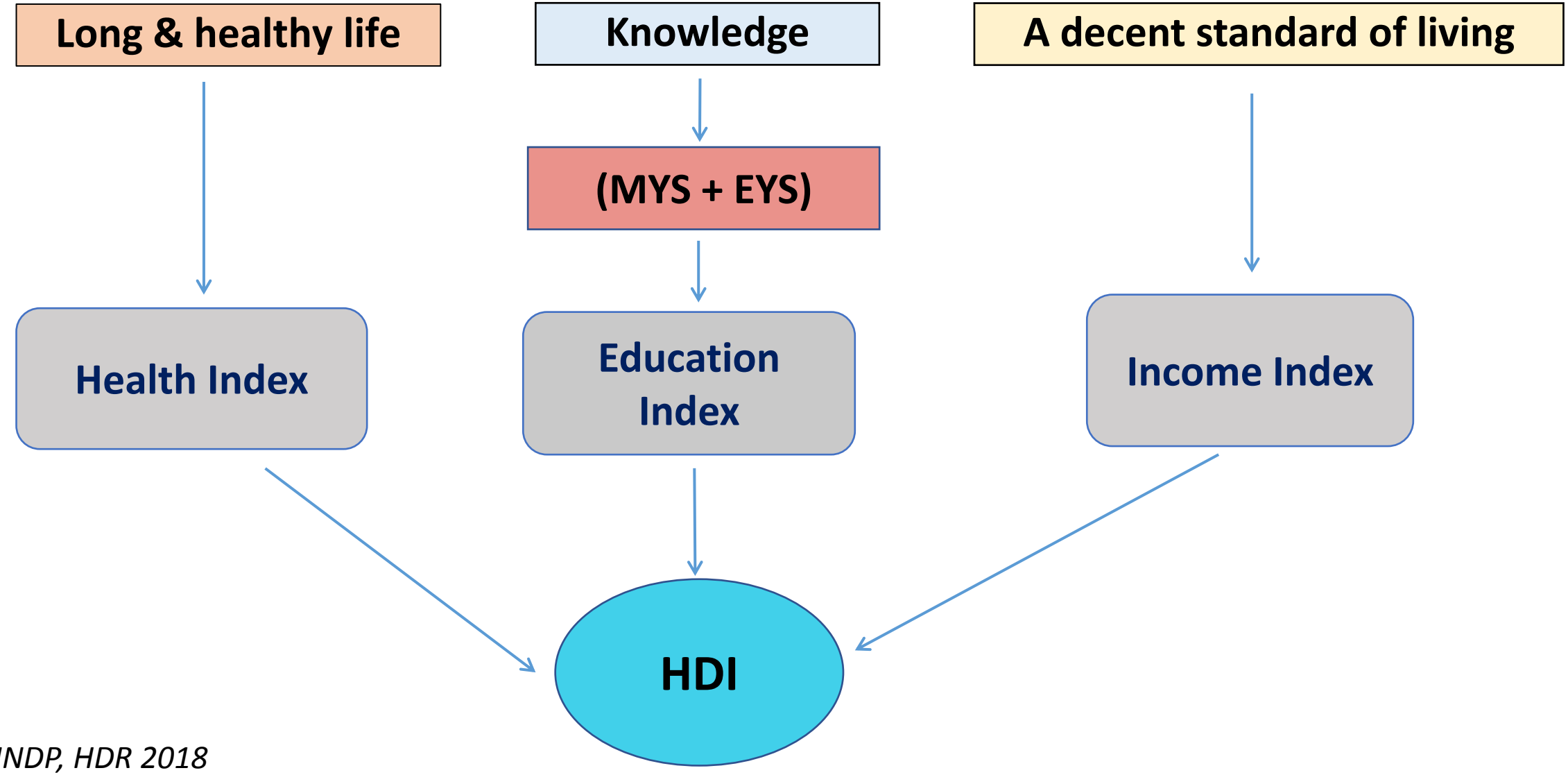
Reservoir name	**Nal damyanti sagar (Upper wardha)**
Reservoir area	7000 ha
Established (fishing started)	1993
Management system	Leasing system
Lease period	5 years
Lease amount	INR 13,55,000
Reservoir leasee	Cooperative society (Nal Damayanti Matsaya Utpadan Sahakari Sanstha)
Total no. of members in cooperative society	110
Total no. of villages	42
No. of fishing villages	13
Total no. of fishers	1325
Total no. of active fishers	585
Total no. of active women fishers	64
Fish production (2017-18)	672 metric tons

Source: DoF, Amravati

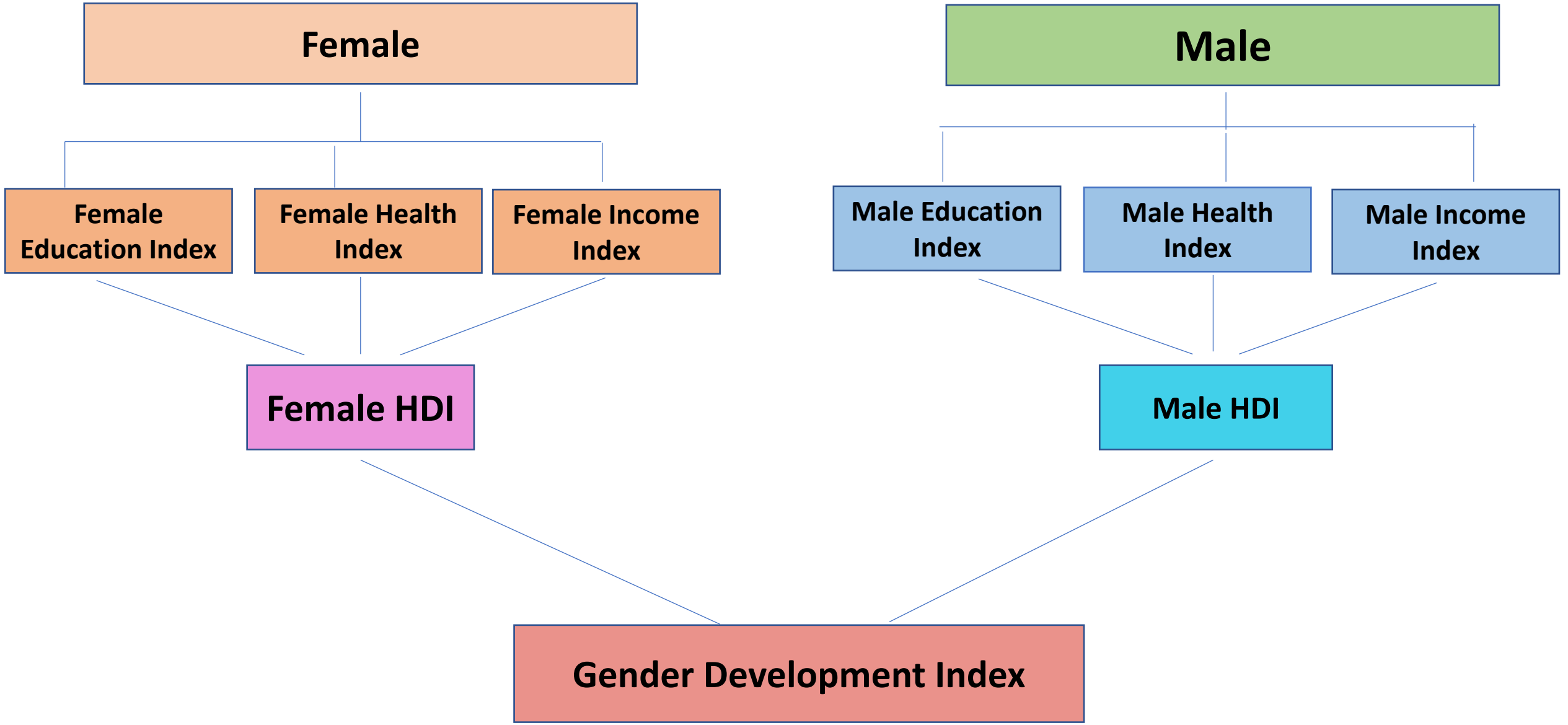
Reservoir fisheries Management

- Reservoir is managed by the co-operative societies from its inception (1993)
- Chairman and members of the co-operative society are responsible for managing all the activities of fish value chain (from seed stocking to fish marketing, security etc)
- Seed stocking is done in reservoir during June to August and seeds are brought from Andhra Pradesh and Gujarat
- Fishers harvest the fishes and sell the catch to co-operative society at a certain rate fixed by the co-operative society. Co-operative society sells the fishes to other big wholesaler, Retailers, Hotels, local markets, near by districts
- Each fishermen or fisherwomen (Local residents of nearby villages & Migrants from other states) were issued a one week water permit for fishing in the reservoir @200 Rs. (men) and 150 Rs. (women)
- After one week fishers again renew the permit and go for fishing in the reservoir

Human Development Index & Gender Development Index



UNDP, HDR 2018


Female
Male
Female Education Index
Female Health Index
Female Income Index
Male Education Index
Male Health Index
Male Income Index
Female HDI
Male HDI
Gender Development Index

HDI, GDI and its Indicators

- HDI and GDI dimensions/indicators were collected through extensive literature review
- Indicators were selected based on an online expert survey, statistically validated and modified up to some extent for the present study
- The responses were collected on selected indicators through primary survey using a semi-structured interview schedule from the members of sample HHs (n=100)

HDI Dimension	Indicators	Variables considered for each dimension	Method of obtaining Index
Education Index at HH	(MSY) Mean Years of schooling (>25 years)	Average year of adult member schooling	1. MSY= Actual-Min/Max-Min GRE= Actual-Min/Max-Min
	(GER) Gross enrollment rate (<25 years)	Enrollment rate of children	2. Education index= (2/3*MSY+1/3*GER)
Health at HH	(AHI) Adult Health Index (>10 years)	Major disease incidences Life threatening disease Adult Health insurance Adult Alcohol consumption frequency Adult Smoking and tobacco consumption frequency	AHI=Actual-Min/Max-Min
	(CHI) Child Health Index (<10 years)	Child vaccination details Major disease incidences Life threatening diseases	CHI= Actual-Min/Max-Min
	(MHI) Maternal Health Index(15-49 years)	Medical attention received in pre and post pregnancy Child delivery place	MHI= Actual-Min/Max-Min

HDI Dimension	Indicators	Variables considered for each dimension	Method of obtaining Index
Standard of living at HH	(AMI) Amenities Index	Access to safe drinking water	AMI= Actual-Min/Max-Min
		Sanitation and hygiene	
		Access to clean cooking fuel	
		Light source	
	(ASI) Assets Index	HH condition and infrastructure	ASI= Actual-Min/Max-Min
		HH Transport facility	Living Standard= (1/5*ASI+1/5*AMI)
		HH Communication facility	
Gender Development Index			
Male HDI	(EIm) Male Education Index	Male MYS	(Actual-Min/Max-Min) EIm= (2/3*MSY+1/3*GER)
		Male GER	
	(HIm) Male Adult health Index	Major disease incidences	HIm= (Actual-Min/Max-Min)
		Life threatening disease	
		Adult Health insurance	
		Adult Alcohol consumption frequency	
		Adult Smoking and tobacco consumption frequency	

HDI Dimension	Indicators	Variables considered for each dimension	Method of obtaining Index
Male HDI	Male Income Index (mII)	Male per capita income (mPCI) of HH	mII= (2/3* mPCI+1/3* mSI)
		Male share of income (mSI) in HH income	
Male HDI= (Education index male*Health index male*Income index male)1/3			
Female HDI	(EIf) Female Education Index	Female MYS	Actual-Min/Max-Min)
		Female GER	EIf= (2/3* MSY+1/3* GER)
	(HIf) Female Health Index	Maternal health (MH)	HIf= (2/3* MH+1/3* CD)
		Child Delivery (CD)	
	Female Income Index (FII)	Female per capita income (fPCI) of HH	FII= (2/3* fPCI+1/3* fSI)
		Female share of income (fSI) in HH income	
Female HDI= (Education index female*Health index female*Income index female)1/3			

HDI_{HH}= (Education $Index_{HH}$*Health $Index_{HH}$*Living Standard $Index_{HH}$)1/3

GDI_{HH}= (female HDI / male HDI)

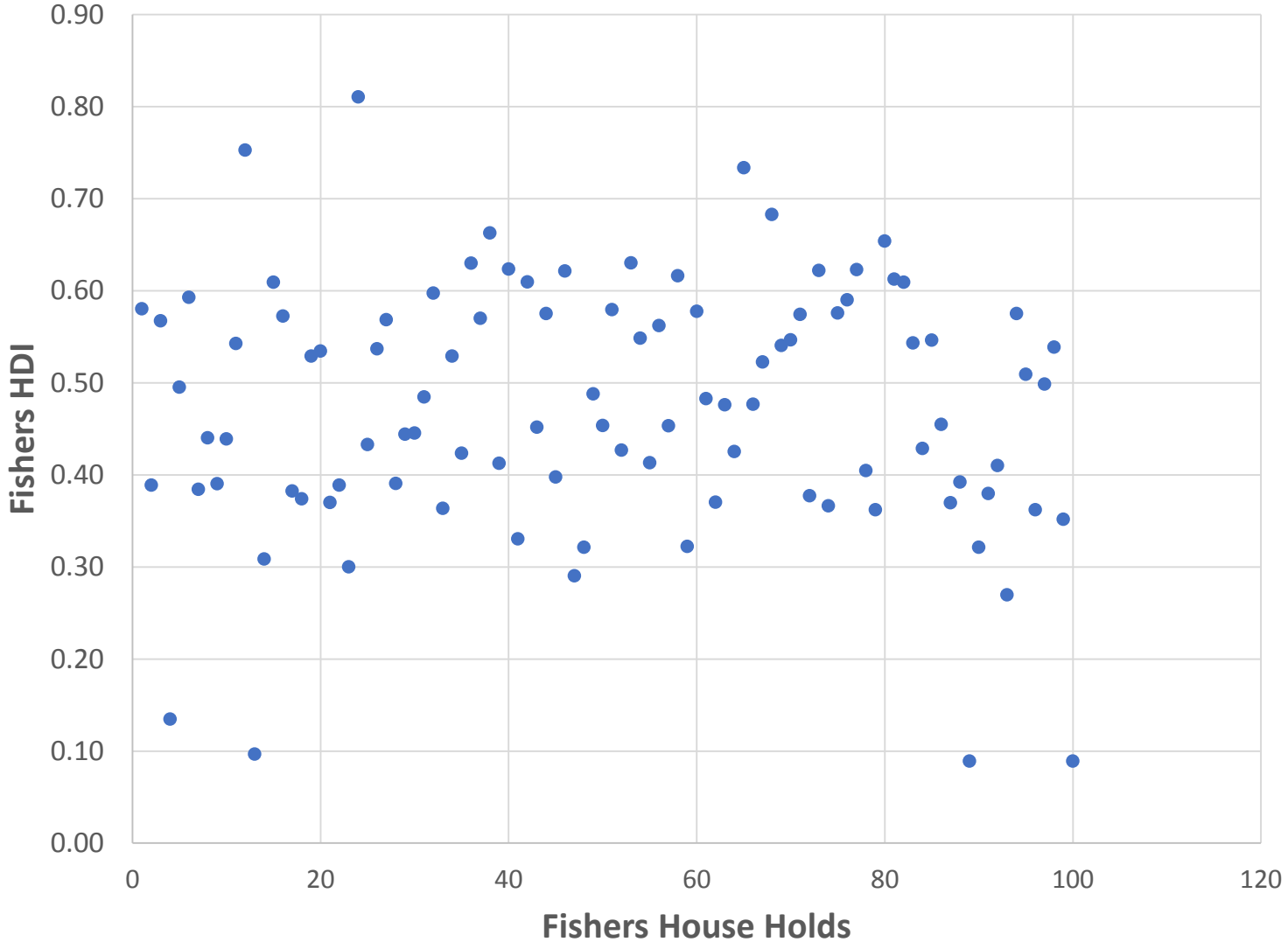
Human Development status of Upper Wardha reservoir fishers

Socio-Economic structure of fishers population in Upper Wardha Reservoir

- Majority of the fishers having an average age of **38 year** (with men **38.5** year and women **37.1** years)
- Majority of fishers with an average schooling of **5 years** with male literacy rate is **63.8** and female literacy rate is **36.2**
- Majority **(60%)** of the fishers population in the study area were not have any kind of disease in last 365 days
- Among the most common disease, Malaria / Typhoid disease was found to be more prevalent in the reservoir area
- **90%** children (<10 years) were immunized with polio, BCG, DPT, Measles vaccines in all fishers households
- **62.8%** females (15-49 years of age) have received medical attention in pre and post pregnancy
- **58%** of studied houses were semi-pucca having electricity as main source of light (100%)
- **83%** HH were using packaged water/purified water for drinking purpose
- Majority of the HH **(68%)** have toilet facility in their house
- **43%** HH have access to clean fuel (LPG) while **57%** HH were using fire wood as source of cooking fuel and all the HH have kitchen facility inside the house having window for ventilation

Human Development Status of fishers in Upper Wardha reservoir

Overall HDI: Household level



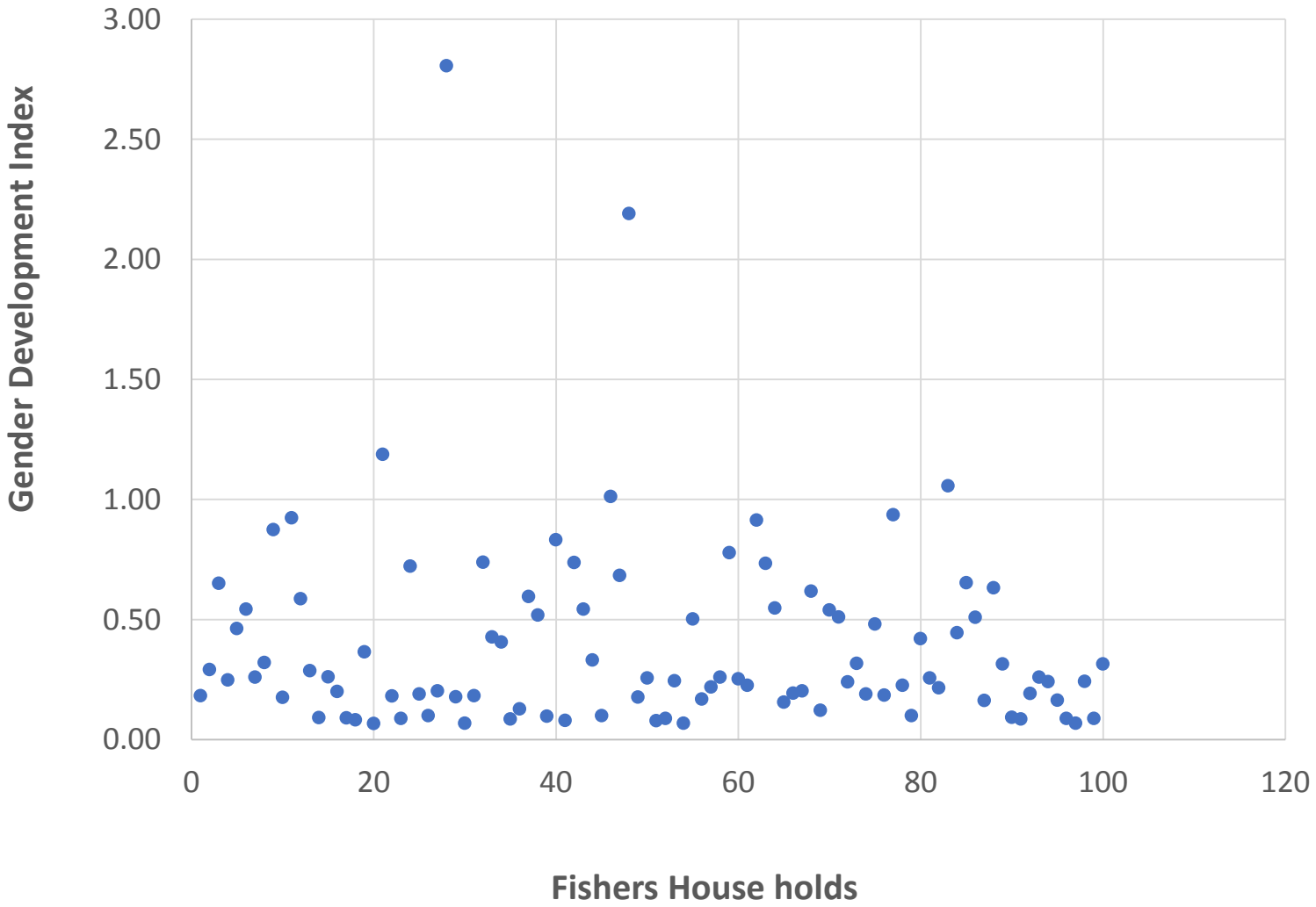
Criteria/HDI Status		HH %
Low HDI	0-0.33	16
Medium HDI	**0.34-.67**	**68**
High HDI	>0.67	16

SD	**0.14**
Mean	**0.48**
Max	**0.81**
Min	**0.09**
p-value	**0.217**

- No significant difference has been found in the HDI status of 100 HH

Gender Development Index (GDI)

Overall GDI: Household level



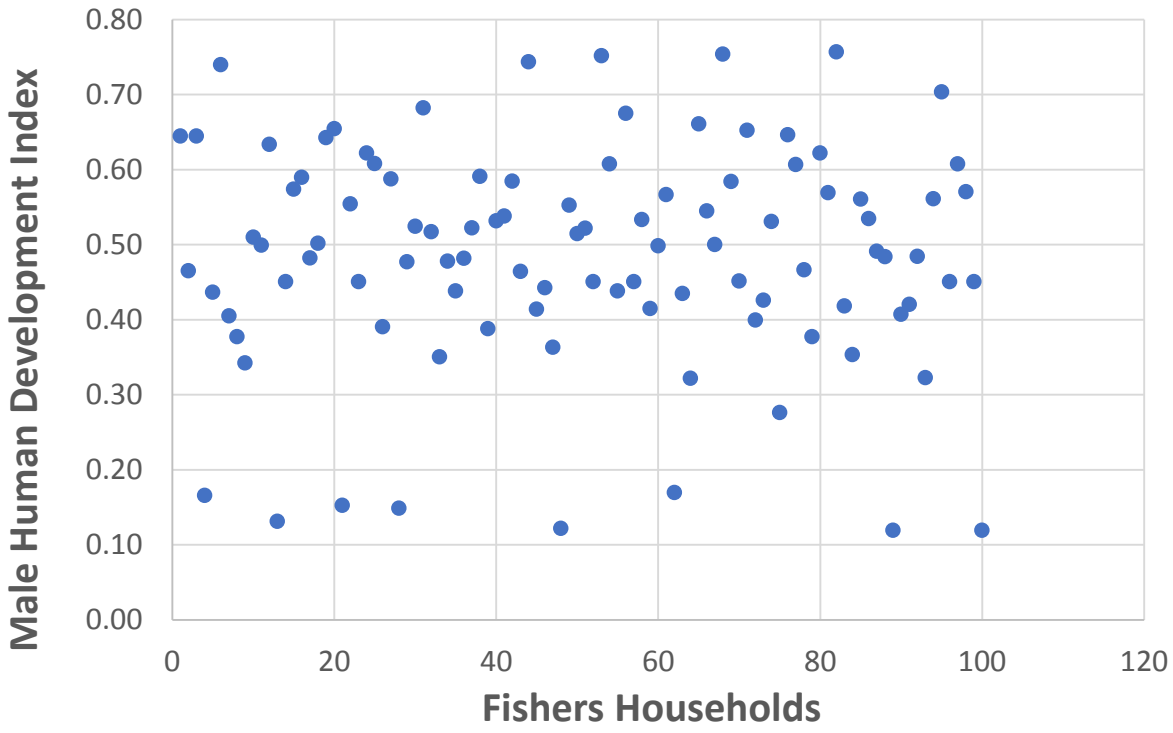
Criteria/GDI Status		HH %
Low GDI	**0-0.33**	**63**
Medium GDI	0.34-.67	21
High GDI	>0.67	16

SD	**0.40**
Mean	**0.39**
Max	**0.81**
Min	**0.07**

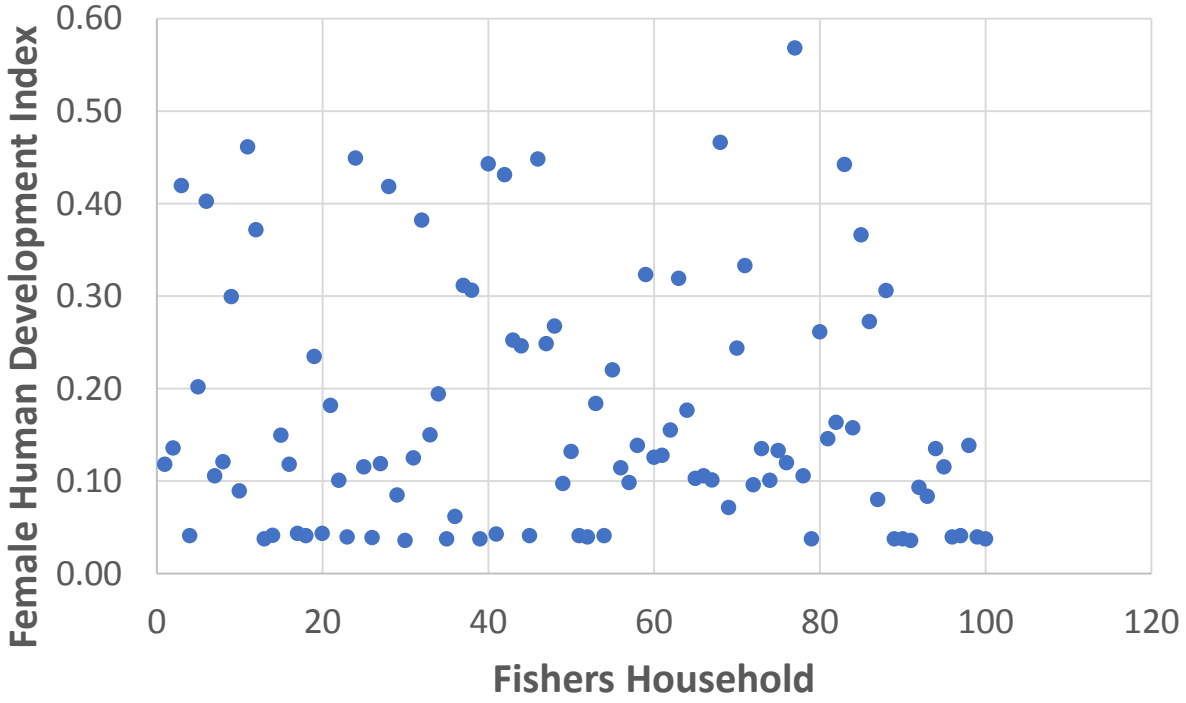
- No significant difference has been found in the GDI status of 100 HH

Male and Female Human Development Index of Upper Wardha reservoir

Male HDI: House hold level



Female HDI: Household level



SD	**0.15**
Mean	**0.49**
Max	**0.76**
Min	**0.12**

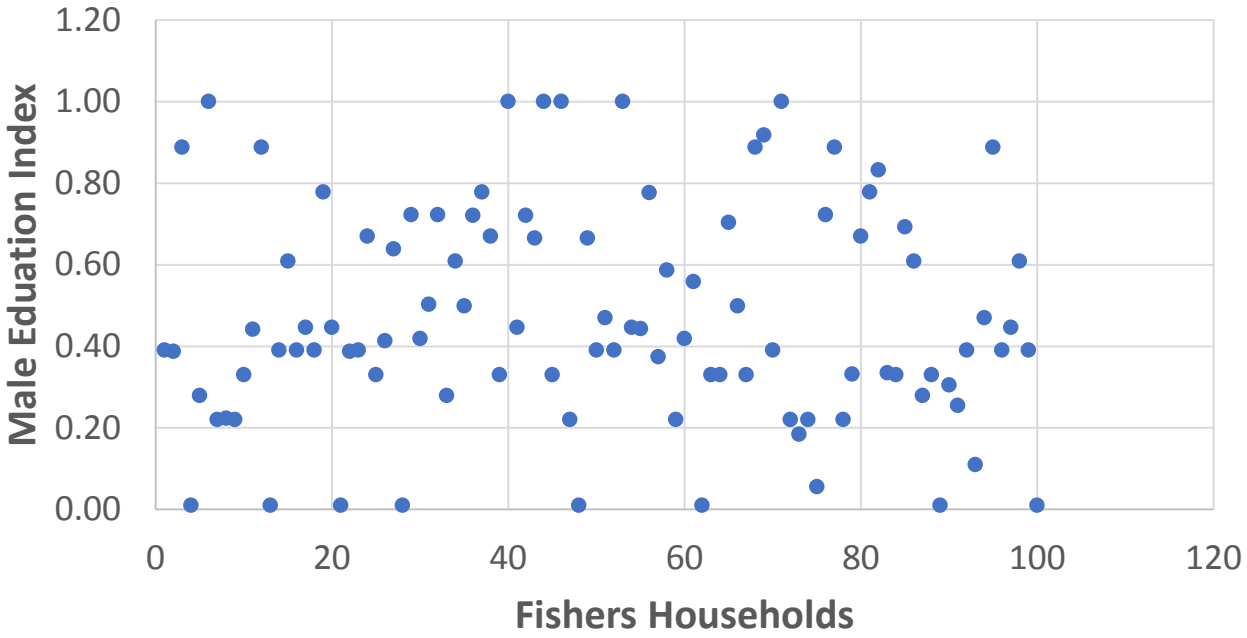
Criteria/mHDI Status		HH %
Low mHDI	0-0.33	11
Medium mHDI	**0.34-.67**	**81**
High mHDI	>0.67	8

SD	**0.13**
Mean	**0.17**
Max	**0.57**
Min	**0.04**

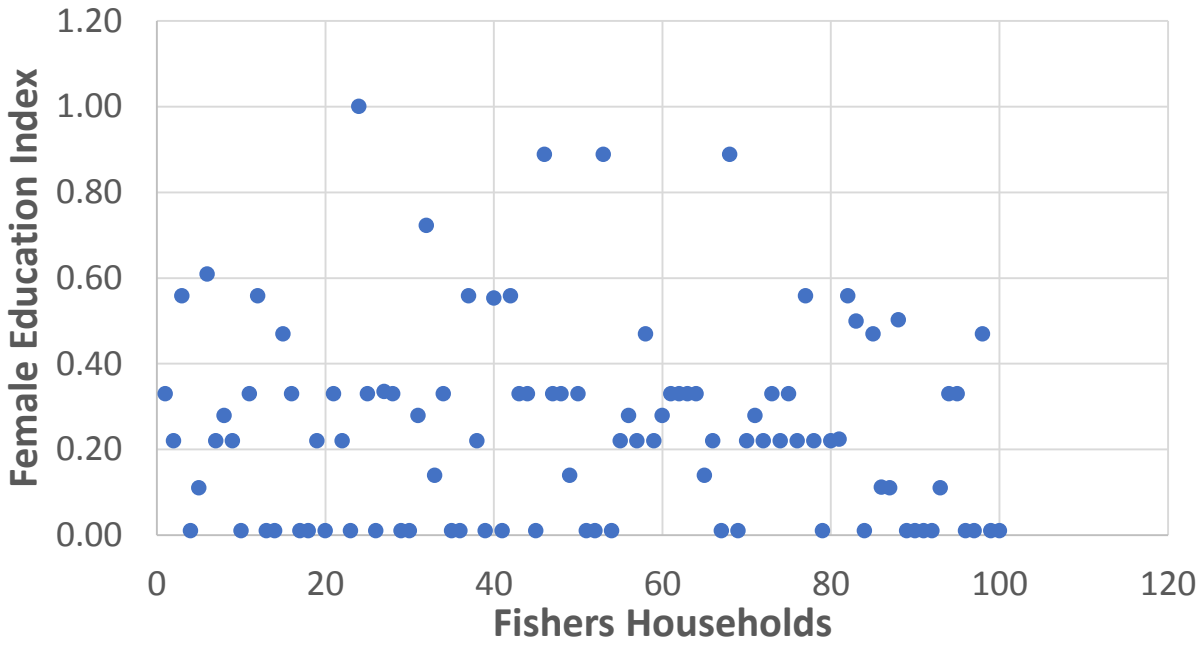
Criteria/fHDI Status		HH %
Low fHDI	**0-0.33**	**86**
Medium fHDI	0.34-.67	14
High fHDI	>0.67	8

Male and Female Education Index of Upper Wardha reservoir

Male Educaion Index : Household level



Female Education Index: Household level



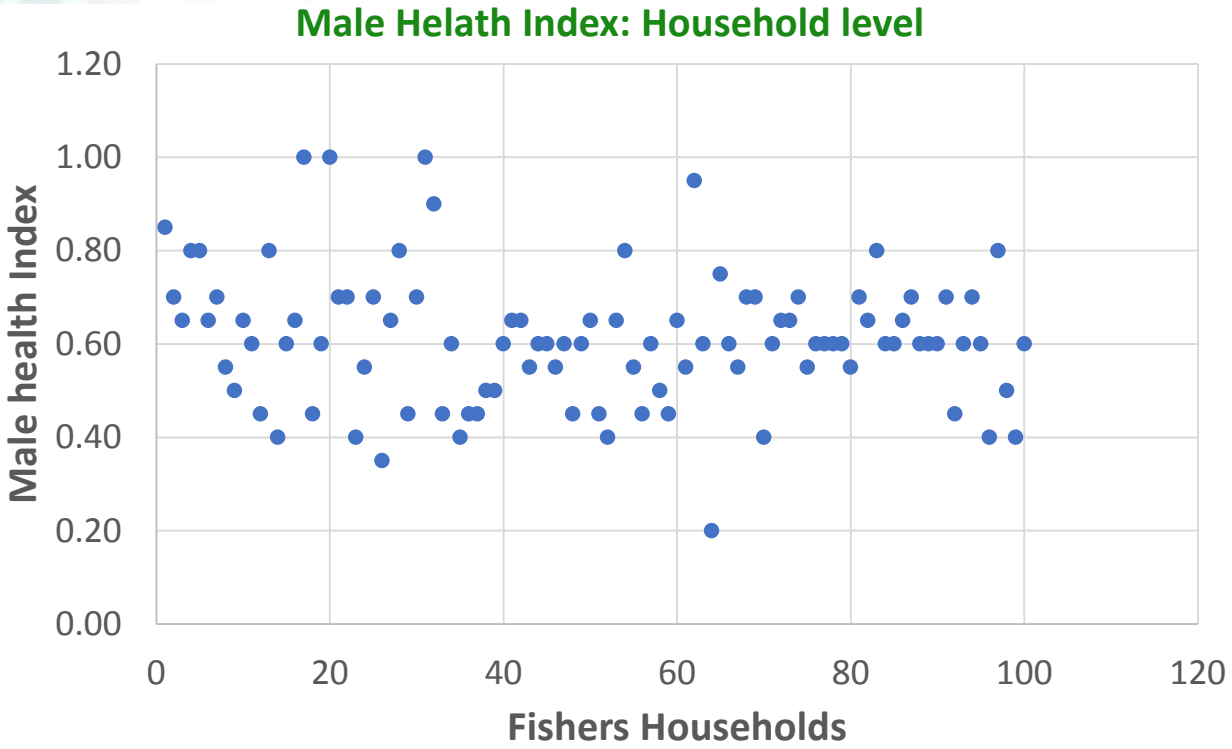
SD	**0.27**
Mean	**0.47**
Max	**1.0**
Min	**0.01**

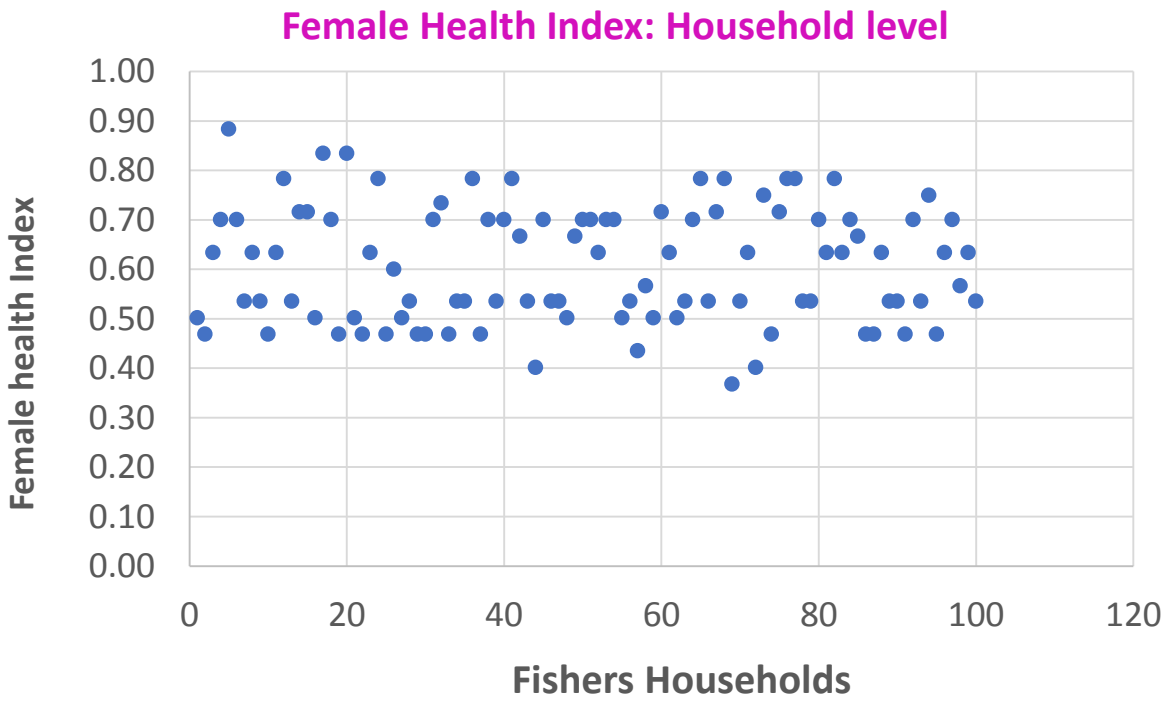
Criteria/mEI Status		HH %
Low mEI	0-0.33	34
Medium mEI	**0.34-.67**	**37**
High mEI	>0.67	29

SD	**0.23**
Mean	**0.25**
Max	**1.00**
Min	**0.01**

Criteria/fEI Status		HH %
Low fEI	**0-0.33**	**80**
Medium fEI	0.34-.67	15
High fEI	>0.67	5

Male and Female Health Index of Upper Wardha reservoir





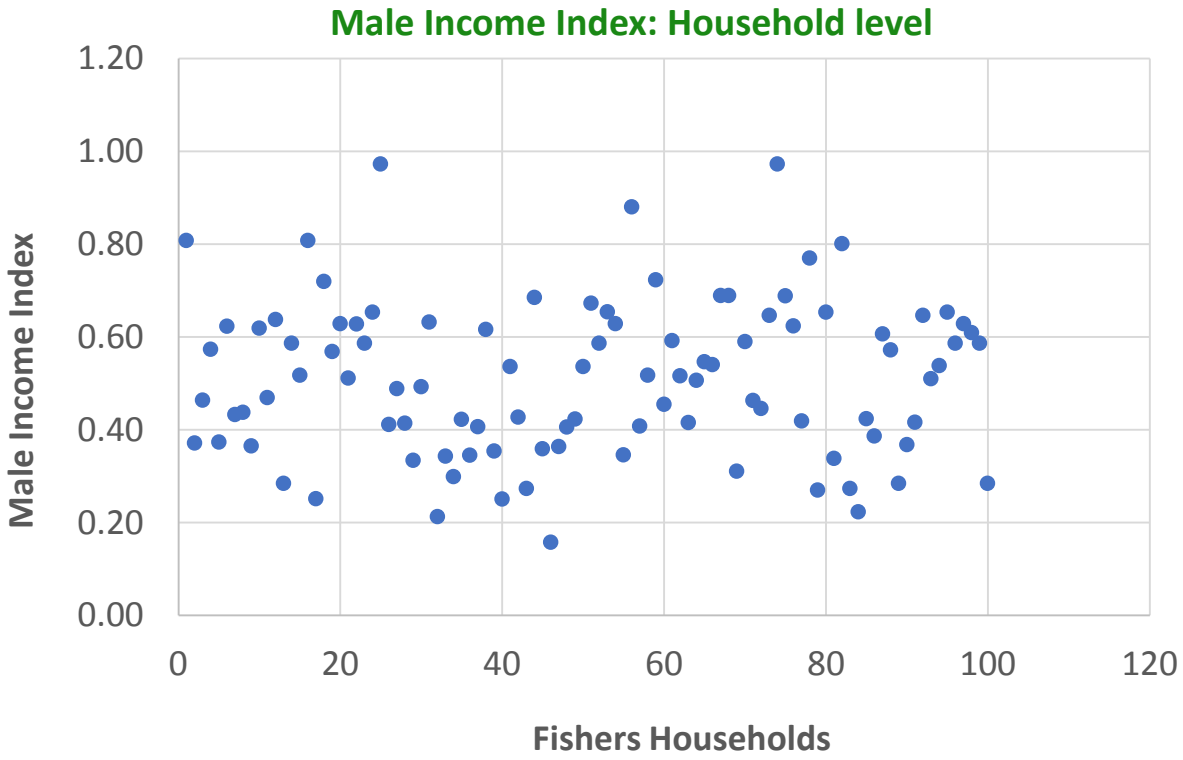
SD	**0.14**
Mean	**0.61**
Max	**1.00**
Min	**0.20**

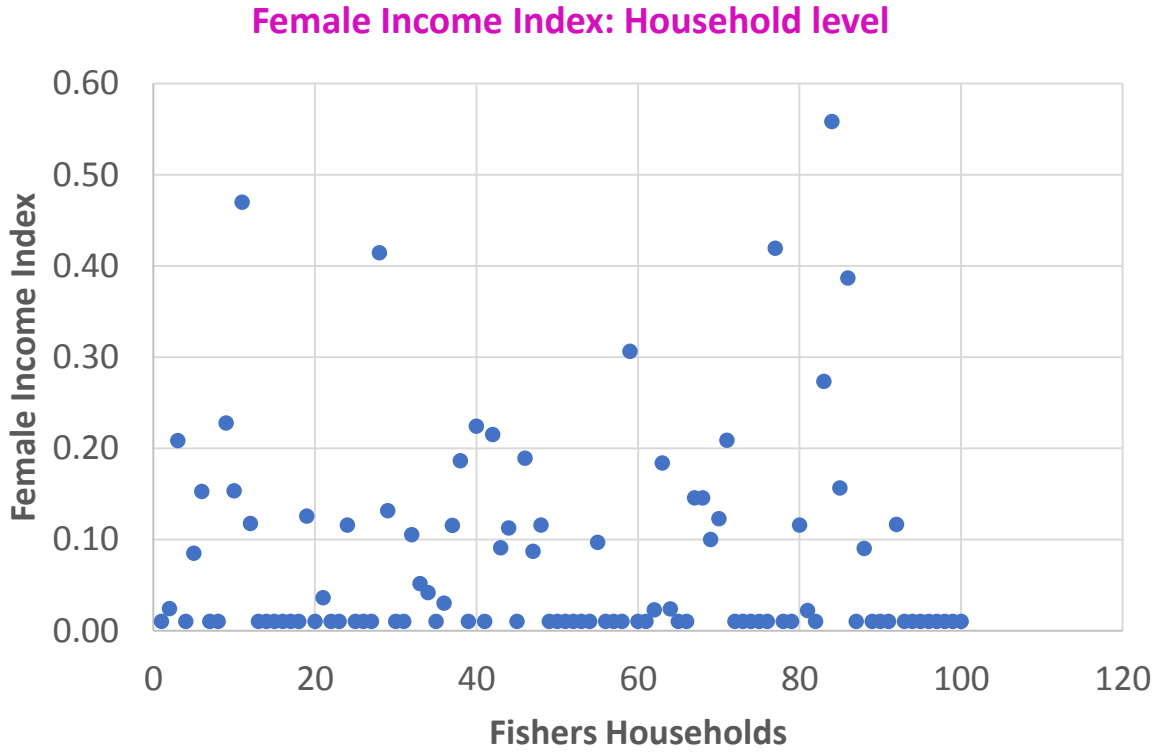
Criteria/mHI Status		HH %
Low mHI	0-0.33	0
Medium mHI	**0.34-.67**	**73**
High mHI	>0.67	27

SD	**0.12**
Mean	**0.61**
Max	**0.88**
Min	**0.37**

Criteria/fHI Status		HH %
Low fHI	0-0.33	0
Medium fHI	**0.34-.67**	**61**
High fHI	>0.67	39

Male and Female Income Index of Upper Wardha reservoir





SD	**0.17**
Mean	**0.51**
Max	**0.97**
Min	**0.16**

Criteria/mII Status		HH %
Low mII	0-0.33	14
Medium mII	**0.34-.67**	**72**
High mII	>0.67	17

Average male income of HHs- 82,240.81/year

SD	**0.11**
Mean	**0.08**
Max	**0.56**
Min	**0.01**

Criteria/fII Status		HH %
Low fII	**0-0.33**	**95**
Medium fII	0.34-.67	5
High fII	>0.67	0

Average female income of HHs- 19000.7/year

Women role in Upper Wardha reservoir fisheries

- women were involved throughout the value chain of reservoir fisheries including pre-harvesting and harvesting

Smoking and drying of small fish







Women involve in different day-to-day activities in Upper Wardha reservoir

Role played by both men and women in upper wardha reservoir

- Men were involved in all the fishing activities starting form pre harvesting to marketing
- Women go on fishing along with their husbands on same boat not as independent fishers
- Women were involved in almost all fishing activities like unloading of fish from boat, sorting, marketing
- Women sells the low value local small fishes after smoke drying in the local markets
- Women were found to be worked as fishers, as a part time agricultural labors, apart from doing their day-to-day HH chores
- Men were found to be worked as fishers , as a part time farm labours, as daily wage labours for their livelihood

Conclusion

- Upper Wardha reservoir observed to be a major source of livelihood and nutritional security for the small-scale fishers dependent on it
- On an average most of the respondents were performing well on all three aspects of human development viz. education, health and living standard
- Health index of all HHs were quite good with an average health index value is **0.50**
- Both men and women were performing well on their health index value with an average value of **0.61** for both
- Fishers have access to the clean cooking fuel, have good sanitation and hygiene facility and have safe drinking water facility which might have reflected in health index of all HHs
- Other factors, like 90% immunization of children in study area, maternal health were also found to be good with an average mean value for women health index **0.61**
- Significant gap has been observed in male HDI and Female HDI which was mainly due to gap in education index and income index between Male and Female
- Education index of men were slightly better than the women education index (women literacy rate was **36%)**

- Female income index was quite low as compared to male income index with mean value **0.51** for **men** and **0.08** for **women**

- Women were not involved in activities which gives them regular earning

- Only a small no. of women (42%) were going for fishing along with their husbands and were involved in other income earning activities

- Women needs be encouraged to participate fully in fisheries activities, enhancing their skills through more participatory extension programme

Thank you