



## COST-BENEFIT ANALYSIS OF POLAVARAM PROJECT AND ITS IMPACT ON TRIBAL PEOPLE IN MALKANGIRI DISTRICT OF ODISHA

**Dr. Satyabrata Mishra\***

**Dr. Pradeepta Kumar Mishra\*\***

\*Associate Professor & HOD in PG Department of Economics, Vikram Dev Autonomous College, Odisha.

\*\*Lecturer in Economics, Dr. Shyama Prasad College, Odisha.

### Introduction

The frequent drying up of the Godavari River in the non-monsoon period and conservation of water has been a matter of great concern of the Andhra Pradesh Government. Indiscriminate construction of embankment along the river has been cited as an obvious reason. Polavaram Dam Project across river Godavari is a Multipurpose Project which has been accorded National Project status by the Central Government and its reservoir stretched to part of Chhatisgarh and Odisha. To comprehend Indira Sagar National Project (Polavaram), it is imperative to know about the river system connected to it. A modest endeavour has been concerted to visualize the river system incorporating Godavari, Sabari and Sileru river. Besides, ingenious attempt has been made to analyse socio-economic condition of the tribal people and nature of displacement of tribal people affected by the Project.

### Objectives and Methodology

The present study intend to verify the following objectives,

- Firstly, to evaluate Cost- Benefit Analysis (CBA) of Indira Sagar National Project (Polavaram).
- Secondly, to examine the impact of the Project on tribal people of Malkangiri District of Odisha.
- Thirdly, to conduct one case study of Malkangiri District with special reference to know the impact on income, displacement and rehabilitation of tribal people affected by Polavaram Dam Project.

The paper is analytical and descriptive. Both primary and secondary information collected have been used to deduce the inferences. The study is based on a survey conducted during April 2017 in the Gram Panchayat of Motu where most of the people in the Panchayat are tribal people and belong to most affected area of Polavaram Project. The other affected villages of Malavaram and Pusuguda Gram Panchayat are excluded from the study.

### Status of the River Godavari

The Godavari River is the second longest river in India after river Ganges and biggest among the rivers of South India. It is originated from Taimbekswar of Maharashtra near Nashik and flows east for 1465 Kilometres (910 Miles). Measuring upto 312,912 Kms (120,777 sq. mis), it forms one of the largest river basin in Indian subcontinent with only the Ganges and Indus rivers having a drainage system bigger than in India. It flows through Nashik via Paithan, Nanded and then reaches to Bhadrachalam. The Godavari river meets with other rivers becomes wider at Basur to flow towards the Bay of Bengal. In terms of length, catchment area and discharge, the Godavari river is the largest in peninsula and popularly known as the 'Dakshina Ganga' in India. The river has been revered in Hindu scriptures since many millennia and continues to harbour and nourish rich cultural heritages. However, in the past few decades, the river has been abused with relentless construction of Dams and Barrages. The river delta, supporting 729 persons/km<sup>2</sup> nearly twice the density of the Nation (Wikipedia-2017).

### Tributaries of Godavari

The river Godavari receives the water from its tributaries by passing through three States of Andhra Pradesh, Maharashtra and Odisha. From its origin Godavari has a number of small and large tributaries drained themselves in its left and right banks, More than eight major tributaries with some small rivers drained to it in different location in its path.

**Table 1: Drainage per cent of tributaries to Godavari**

S. No	Drainage channel	State	Drainage (%)
1	2	3	4
1	Upper, Middle & Lower basins of Godavari	Maharashtra, Tellingana, Andhra Pradesh & Puducheri.	24.2
2	Pranhita	Maharashtra	34.87
3	Indravati	Odisha	12.98
4	Maniira	AP	9.86
5	Saberi	Odisha	6.35
6	Purna	Ap	4.98
7	Manair	AP	4.18
8	Pravara	AP	2.08
Total			100

Source: <https://Wikipedia.org>



The upper middle and lower basin of Godavari contribute a major portion to this river and a per cent of water contribution of its tributaries are mentioned (Table-1). From the above table, it is construed that Pranhita drainage channel of Maharashtra is having the largest drainage of 34.87% and the lowest 2.08 % drainage by Pravara drainage channel of Andhra Pradesh.

### Godavari River: A Connection with River Sabari and Sileru

Godavari flows through hilly terrains of Papi Hills in the Eastern Ghats and become narrow and form a gorge for few Kms and again re-widen at Polavaram. Before passing the Papi Hills, it receives its last major tributary Sabari and Sileru rivers at its left bank. A brief discussion is essential to know about Sileru and Sabari for the study of Polavaram Project.

### Sileru River and Hydro- electric potential in Machhakund-Sileru basin

Sileru river is a tributary of Sabari River. It is originated from Andhra Pradesh but flows through Odisha before merging with Sabari. Sileru flows at the border of Andhra Pradesh, Odisha and merge with Godavari River. The water released from Balimela Power House is used for irrigation purpose by Potteru Irrigation Project (PIP) in Sabari basin. The perennial water supply of Sileru River comes to mid land of East Godavari District and get diverted to Donkari Reservoir with an altitude of 330 Minimum Sea Level (MSL).

The water of Machhakund, Duduma and Gurupriya have been harnessed for hydro-electricity in Machhakund-Sileru Catchment area. The hydro-electric and Water Projects constituted in

**Table 2: Hydro Electricity Potential of Sileru Basin**

S. No	Name of the Project	Instaled MW.	State
1	2	3	4
1	Machhakund	360	Andhra Pradesh & Odisha
2	Balimela	360 (proposed 4800)	odisha
3	Donkrai	60	Andhra Pradesh
4	Upper Seleru	240	Andhra Pradesh
5	Lower Seleru	460	Andhra Pradesh

Source:<https://Wikipedia.org>

Machhakund-Sileru Catchment area where, as many as 13 small and large Projects seen.excluding Polavaram Project. The Projects like Machhakund,Balimela,Donkarai,Upper and Lower Sileru Projects are located in Machhakund-Sileru-Sabari Catchment area but it shows that Lower Sileru Project generates 480 MW power which is highest then Machhakund and Balimela Power Projects (Table-2).

### Sabari River

Sabari is one of the important tributary of Godavari. It originates from the Eastern Ghats of Odisha from Sinkaram Hill Ranges at 1370 metre (4490 Fts) altitude from Minimum Sea Level (MSL). It coordinates 18 Degree North and 82 degree East. The Sabari river basin receives nearly 1250 mm average rainfall. It forms a common boundary of Odisha and Chhatisgarh forming 200 Kms long. The beginning part of Sabari river is commonly known as Kolab river in Koraput District of Odisha. Upper Kolab Project is located in Odisha across the river Sabari and is a major Dam Project supplying water for irrigation and hydro power generation. Sabari river has merged into Godavari river near Kunavaram.

The main tributaries of Sabari river are Potteru,Saptadhara,Kolab Sileru and Indravati rivers. The length of the river is 418 Kms (260 miles). The basin Catchment area of the river is 20,427 Sq. Kms (7887 Sq. miles). The 200 Km long stretch of the river forming boundary between Chhatisgarh and Odisha. The river has substantial hydro electricity generation potential by building medium head ( 20 m) barrages in series to minimize land submergence. The surplus water of Indravati River in Odisha can also be diverted to Sabari river via Jaura Nallah through which Indravati flood water naturally overflows into Sabari basin.

### A Profile of Indira Sagar National Project (Polavaram)

Polavaram is a village in West Godabari of Andhra Pradesh. It comes under Palavaram Mondal of Jangareddygudem revenue division. The name of the Lok Sabha Constituency is Eluru and Bidhan Sabha is Polavaram. The Papi Hills and Polavaram Project are the major land mark of this area. Polavaram is located at 17.2500 degree North and 81.6333 degree East. It is an average elevation of 16 metres (55 fts). It is in Andhra Pradesh of West Godavari District. The total area is 28.36 Kms. As per 2011 Census the total Population in the village is more then 13861 and its density of population is 490/Kms



(1300/Sq.mitres).Time Zone is IST(UTC+5|30). The climate of the area is hot. Indira Sagar National Project (Polavaram) was concerned as a Multipurpose Project providing irrigation to different towns, villages and cultivable land through its canal system, generating hydro-electricity and other purposes, like flood control and fishing. The Project envisaged construction of an earth-cum-rock hill Dam to fulfill the criteria for being a National Project.

### Status of Polavaram Project

As per the proposal, 2310 meter long and 38.32 meter height dam will be constructed to conserve 80 cusec water in its reservoir. The water of the reservoir will be supplied to 2.91Lakh Hect. of land in four districts like Visakhapatnam, East Godavari, West Godavari and Krishna of Andhra Pradesh. Water in its reservoir will be supplied to 174 Km long to Krishna district and 181 Km long to Visakhapatnam district through its left and right canal system. In the initial stage Rs. 9265 crores will be defrayed to construct the project. An additional 60 crores will also be invested as per the requirement. It was proposed to construct a barrage at Polavaram village 4.2 Kms. distance from the Polavaram Dam (Map-1).

**Map 1: Location of Polavaram Dam in Chhatisgarh, Odisha and Andhra Pradesh**



There was an inter-state agreement in between undivided Madhy Pradesh, Andhra Pradesh, Maharastra and Odisha government in 1974-75. At that time Polavaram project was stopped and later it was decided to change the structure by observing a great loss, and opposed in various quarters.

**Map 2: Polavaram Project and its Status in Andhra Pradesh, Chhatisgarh and Odisha**



Now the Government of Andhra Pradesh decided to construct the dam which will conserve 150' to 187' feet of water level in the reservoir. As per the statistics of Polavaram Authority 250 villages, 3223 hectares of reserved forest and 47043 hectares of un-demarcated forest land will be submerged by its reservoir in Odisha. Andhra Pradesh and Chatisgarh (Map-2).

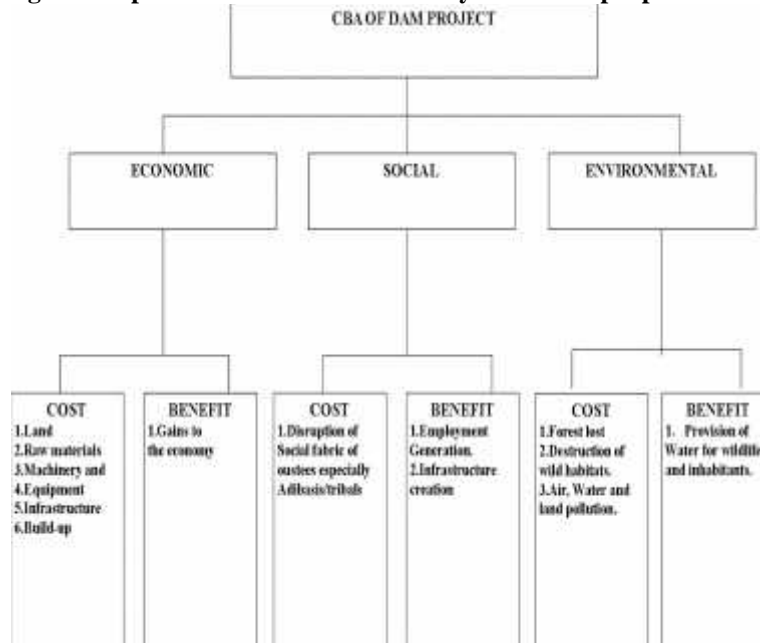
### Cost-Benefit Analysis of Polavaram Dam Project

Dam projects in the hills have different forms in their engineering characteristics. The investments are mainly for supply of water to an industrial area, provision of irrigation to the cultivable land and prevention of flood damage . The other benefits are the development of internal navigation, fisheries, soil conservation and riverside recreation (Dasmann,et al.,1973).



Like the benefits, many Reservoirs have affected the ancestral homes and land of the people, It also creates forced resettlement, environmental damage and agravate diseases and nutritional problems. A complete account of Social, Economical and Ecological costs should be included in determining the Cost-Benefit Analysis of a Dam Project. The details of Cost-Benefit Analysis inevitably differ from Project to Project. Here, the study covers the sample only (Fig-1).

**Fig 1: Components of Cost-Benefit Analysis of Multipurpose Dam Projects**



Source: P.K. Mishra, 2002

### Benefit Related to Polavaram Dam Project

The Project will provide water to an area of 2.914 lakh Hect.(7.20 Acres) for irrigation puepose. The anticipated power generation of the Project will be 3,100 Million Units per year. 23,44 TMC water will be supplied to the fast growing harbar city of Vishakhapanam. Various industries viz: Outer Harbour, Ship building yard, Port trust, Eastern Naval Command, Bharat Heavy Plates & Vessels, Cattex Oil Refinery, Coramandal Fertilisers, Zinc Smelter Plant in and around Visakhapatnam city will be benifeted. Diversion of 80 TMC of Godavari waters to Krishna river at Vijayawada, leading to reach for irrigation of vast drought prone areas in Karnataka and Maharastra (35 TMC) and Rayalaseema of Andhra Pradesh and Telangana (45TMC). To transport mineral, forest produce and food grains to different marketing centres, the Project will stand for navigation from Polavaram to Visakhapatnam. Besides urbanisation Tourism Development, Pisciculture, Recreational facilities will be created in the region.

Before calculating the Cost-Benefit Ratio, it needs to know the cropping pattern produce by the local people. The Left and Right canal facilitated irrigation for paddy, sugarcane, chillies and pulses. The utilization of water in left canal is 126.55 TMC and utilization of water in Right Canal is 101.78 TMC.(Table-3)

**Table 3 : Cropping Pattern Proposed by Polavaram Authority**

S. No	Proposed cropping	Under Left Canal		Under Right Canla		Total	
		Area in	Utilisation	Area in	Utilisation	Area in	Utilisation
1	Paddy	2.00	58.54	1.601	48.05	3.601	106.59
2	Sugar Cane	1.25	55.70	1.001	43.74	2.251	99.44
3	Chillies	0.75	4.07	0.580	3.40	1.329	7.47
4	Pulses over	2.00	8.24	1.601	6.59	3.601	14.83
<b>Total</b>			<b>126.55</b>		<b>101.78</b>		<b>228.33</b>

Source: <https://Wikipedia.org>



### Cost Related to Polavaram Dam Project

Most of the cost in a Dam Project relates to its submergence of land, forest and expenditure relating to its construction and rehabilitation package. Highest land will be lost in Andhra Pradesh is 44.513. (Table-4)

**Table 4: Submergence of Polavaram Dam Project**

S. No	Submergence State	Loss in Hact.	Remarks
1	2	3	4
1	Andhra Pradesh	44,513	-
2	Chhatisgarh	1504	Flood Bank Protection
3	Odisha	1026	Flood Bank Protection

Source: Sambad 25<sup>th</sup> August 2010

### Cost Related on Construction of Polavaram Dam Project

The Project needs a heavy cost for its construction work. It is decided to spend an amount of 1601045 crores. The Table-5 indicates the cost incorporated only in construction work.

**Table 5: Cost of the Project in construction work (2010-11 price)**

S. No	Project Heads	Expenditure( in Crores)
1	2	2
1	Dam & Appurtenant Works	9135.79
2	Right Main Canal	2370.79
3	Left Main Canal & Water Supply Canal	1635.47
4	Power House	2868.40
<b>Total Cost</b>		<b>16010.45</b>

Source: <https://Wikipedia.org>

Investment in Mega Projects environmental protection is normally less prominent (Dasgupta et.al, 1972, little and Mirrules, 1974). Here the work is excluded the environmental cost which needs valuation.

### Needs of Rehabilitation package for Displacement of People in Polavaram Project

There is a huge uproar of tribal and non-tribal people against the Project in Odisha, Andhra Pradesh and Chhatisgarh by realizing involuntary displacement, forest depletion and environmental issues. The suffering of the tribal people due to the displacement of the reservoir indicates that the tribals of Andhra Pradesh will be more sufferer in comparison to other two States. (Table-6) The enormous costs, huge environmental degradation and massive involuntary displacement force the people to raise their demands through Anti-Dam Movements.

**Table 6: Tribal displacement under Indira Sagar Project (Polavaram)**

S. No	States	Tribal	Number of displacement	Movement / Activists
1	2	3	4	5
1	Odisha	Koya,Goti koya	6315	BJD and Local Leaders,Tribals
2	Chhattisgarh	Muriya,Dorla,,Halwa,Chatisgadia, Gond,Bhatri	11766	CPI,GVSP
3	Andhra Pradesh	Koya,Dorla,Reddy koya,Goti koya	19300	Tudumdeba,AVSP,GVSP

Source: Compiled from primary data

Environmentalists, social workers, NGOs, tribal leaders and local people started protesting the Project by looking its Ecological-Economic impacts in the region. At the time of Primary Survey at Motu a tribal people said that the Andhra Pradesh Government has been compensating their displaced and submerged people through a rehabilitation package but our people will be excluded from the compensation as no consultation has made to us till date where as the Project is going to be completed soon. With the empirical observation, it is found that there is a panic of displacement accentuated among the tribal people in this region of Odisha.

### A profile of the Region in Malkangiri District of Odisha

Malkangiri district of Odisha is bounded by two major river like, Sabari and Sileru. The river sileru is the boundry of Odisha and Andhra Pradesh and the river Sabari is the boundry of Odisha and Chhatishgarh. The area is above 300 of MSL.



Malkangiri district came as a separated district on 2<sup>nd</sup> October 1992 from undivided Koraput district and is the most southern district of Odisha, where 57.65 per cent of population are tribals, 19.50 per cent of population are schedule caste and 22.45 per cent of population are other categories. The total area of the district is 5791 Sq.Kms (2236 sq.miles). The total population of the district is 612,727 with a density of 83 Sq. Kms. Population growth rate is 21.53 over the decade in 2001 to 2011. The sex ratio is 1016 female per 1000 male and the literacy rate is 49.49 per cent.

Most of the people in the region depend on agriculture and forest produce. The region has abundant water resources and paddy is the principal crop. People also cultivate other crops like, wheat, maize, ragi, greengram, balckgram, horcigram, til, groundnut and mustard. The forest cover of the district is 36.64 per cent. The forest area is gradually decreasing in the area due to developmental projects and increase in population in the district. The people of the district collect mahua flowers, mahua seeds, kendu leaves and bamboo for selling and domestic purpose. Most of the villages under submergence by Polavaram Dam Project belong to Koya habitantion. So this section requires an analysis their socio-economy status including their peculiarities.

### Life style of Koya People

The Koyas, one of the several Dravidian speaking tribes of south Orissa, are numbered about 55,000 in 1961 (Adibasi, 1969-70). Their population increased to 58,730 in 1972 and 140,000 in 1991 census by 2001 and 2011 their population is 121,4791 and 145,6452 respectively in Malkangiri District. Koyas are living in Kalimela, Podia, Malkangiri and Korkunda blocks. The koya literacy rate is still very low (Sahu 1998, P-19) Koya settlements lie in the midst of forest and most villages are approached by narrow foot-steps except some villages which are connected to nearby road. The Koyas are living in an irregular distribution of houses in the village with bad sanitation (Adibasi ,1970). They have good numbers of domestic animals like cocks, pigs, cows, goats, bullocks and dogs (Sahu,1998, P-20).

Agriculture is the main occupation of Koyas. They are habituated with shifting cultivation. Beside paddy, they are producing tobacco, ragi, maize, suan, blackgram and greengram. They are collecting minor forest produce for domestic use and sale in the local markets. The main forest collections are mahua flowers, mahua seeds, kendu leaves, bamboo, firewood and timber. They are regularly consuming mahua and solap wines. In festivals they go for haunting games and trapping birds. Trees like mango, jack fruits, solap, palm, mahua trees occur all around their villages (Adibasi,1970)

### General information about the Project affected village in Motu Gram Panchayat

Motu Gram Panchayat comes under Podia Block of Motu Tahasil in Malkangiri District of Odisha is adjacent to the bank of river Sabari and Sileru and also boder area of Andhra Pradesh and Chhatisgargh where Polavaram Project is located from a fewer distance. So Motu Gram Panchayat selected for the study to know the impact of the Project. The study depicts that 754 households with population will come under submergence. (Table-7)

**Table 7: Anticipated villages affected in Motu Gram Panchayat due to Polavaram Project**

S. No	Name of Revenue Village	Near to River bank (Kms)	Distance from the River	No. of Households	Total Population
1	2	3	4	5	6
1	Motu	Sabari & Sileru	0	260	964
2	Baribanchara	Sabari	0	04	12
3	Binayakpur	Sabari	0.5	131	524
4	Alma	Sabari	0.5	111	445
5	Muraliguda	Sabari	0.5	130	538
6	Pinamadguru	Sileru	0.5	52	224
7	Kotaguda	Sileru	1	66	332
<b>Total</b>				<b>754</b>	<b>3039</b>

Source: Compiled from Primary data

Five Hamlets of Motu Tahasils located in the bank of river where 125 households with 604 population will be come under submergence. (Table-8)



**Table 8: Anticipated Hamlets affected in Motu Gram Panchayat due to Polavaram Project**

S. No	Name of Hamlets	Near to River bank (Kms)	Distance from the River	No. of Households	Total Population
1	2	3	4	5	6
1	Redipal	Sileru	0.5	18	72
2	Laxmanguda	Sabari	1.5	10	49
3	Kamalapuram	Sileru	0.5	52	268
4	Lachhipuram	Sabari	1.5	38	186
5	Tertriguda	Sabari	0.5	07	29
<b>Total</b>				<b>125</b>	<b>604</b>

Source: Compiled from Primary data

The Table-9 shows a detailed population structure of different categories those will be victimized due to the Project. The empirical observation shows that a grand total of 879 household with 3643 population will loss their livelihood.(Table-9)

**Table 9: Total Population affected in Motu Gram Panchayat**

S. No	Category	No. of HHs	Male	Female	Total (4+5)	Tribes
1	2	3	4	5	6	7
1	STs	722	1402	1542	2944	Koya & Goti Koya
2	SCs	27	55	43	98	Damba, pana & Bengali(Namasudra)Others
3	Other Category	130	309	292	601	Hindus,Musilms, & Chritians
<b>Grand Total</b>		<b>879</b>	<b>1766</b>	<b>1877</b>	<b>3643</b>	-

Source: Compiled from Primary data

#### Benefits Provided to the Villages and Hamlets in Motu Gram Panchayat

The development among the tribal villages are far better then 12 years back by the implementation of plans and policies with special assistance of the State and Central Government's sponsored KBK and BKBK Progammes (Table-10). So this will be a great loss of Odisha and a hindrance in development of tribal people after the implementation of Polavaram Dam Project.

**Table 10: Benefits available in the Villages and Hamlets in Motu Gram Panchayat**

S. No	Types of Benefits	Numbers in Villages	Numbers in Hamlets	Total
1	2	3	4	5
1	Tahasil	1	-	1
2	Anganwadi Centre	5	1	6
3	Primary & Upper Primary Schools	7	6	13
4	High School	2	-	2
5	Collegs	-	-	-
6	PHCs & Dispensary	1+1	-	2
7	Police Station	1	-	1
8	Bank	1	-	1
9	Forest Office	1	-	1
10	R I Office	1	-	1
11	Electric Office	1	1	
12	Verternary	1	-	1
13	Electric Supplied Villages	6	4	10

Source: Compiled from Primary data

#### Anticipated Economic Loss among the Tribal People after the Project

The submergence of the Project will create troubles in many ways among the tribal people. A panic has been accentuated among the local people in the area. It is predicted that the income of the tribal people will greatly be affected. From Table-11, it is evident that 21 households having an income of above Rs.60,001 is an average of 6.13 Hect. land produce agricultural yield of an average of 14.16 Qlts which accure average revenue of Rs. 15,576 where as 326 households having



annual income of below Rs. 20,000 with an average of 1.06 Hect. of land area produce an average of 2.01 Qutls. average income of Rs. 2211.

**Table 11: Annual Income of Tribal People from Agriculture (Quintals @ \$ 1100)**

S. No	Income Range	Average Land Occupied (Hects)	Average Agricultural Production (in Quintals.)	Average Revenue (in Rs.)	No. of Households
1	2	3	4	5	6
1	Below 20,000	1.06	2.01	2211	326
2	20,001-40,000	2.26	5.13	5643	301
3	40,001-60,000	3.74	7.32	8052	74
4	Above 60,001	6.13	14.16	15576	21
<b>Total</b>				<b>4629.19</b>	<b>722</b>

Source: Compiled from Primary data

Table-12 reveals that 21 households having income range of above Rs. 60,001 earn average revenue of Rs. 4320.16 from the proceeds of Mahua Flower, Rs. 2500.55 from the proceeds of Mahua Seeds and Rs. 3700.42 from the proceeds of Tendu Leaves where as 326 households having income range of below Rs.20.000 earns an average of Rs.720.12 from the proceeds of Mahua Flower Rs. 420.24 from the proceeds of Mahua Seeds and Rs. 225.54 from the proceeds of Tendu Leaf.

**Table 12: Annual Income of Tribal People from Forest Produce**

S. No	Income Range	Average Revenue of Mahua Flower (Rs.8/Kg)	Average Revenue of Mahua Seeds (Rs.15/Kg)	Average Revenue (Tendu Leafes)	No. of Households
1	2	3	4	5	6
1	Below 20,000	720.12	420.24	225.54	326
2	20,001-40,000	945.11	721.42	322.51	301
3	40,001-60,000	2015.15	1540.43	1200.13	74
4	Above 60,001	4320.16	2500.55	3700.42	21
<b>Total</b>		<b>1061.33</b>	<b>721.12</b>	<b>466.92</b>	<b>722</b>

Source: Compiled from Primary data

From Table-13, it is revealed that 21 households having income range of above Rs. 60,001 earn average revenue of Rs.361.22 from Livestock Rs.150.32 from Social Forestry Rs.250.50 Labour Card and Rs. 18421.32 from other sources whereas 362 households having income range of below Rs. 20,000 earn average revenue of Rs. 240.12 from Livestock, Rs. 120.24 from Social Forestry, Rs. 350.54 from Labour Card and Rs.225.54 from other sources.

**Table 13: Annual Income of Tribal People from Other Sources (In Rs.)**

S. No	Income Range	Average Revenue(Livestock)	Average Revenue (Social Forestry)	Average Revenue (Labour Card)	Income From Other Sources	No. of Households
1	2	3	4	5	6	7
1	Below 20,000	240.12	120.24	350.54	225.54	326
2	20,001-40,000	351.72	240.12	322.12	1200.45	301
3	40,001-60,000	240.88	250.35	615.55	9034.11	74
4	Above 60,001	361.22	150.32	250.50	18421.32	21
<b>Total</b>		<b>3774.54</b>	<b>180.27</b>	<b>180.27</b>	<b>2067.16</b>	<b>722</b>

Source: Compiled from Primary data

### Conclusion

Generally, Dam Projects have different positive and negative dimensions. The positive effects rrelated to water supply, generation of hydro-electricity, prevention of flood damage, fishery, navigation and recreation etc. Major Socio economic costs are displacement, valuable land loss, forest loss, environmental degradation and biodiversity depletion etc. Big Dams usually cause big damages in terms of loss of human settlements, resources, forests, wild life and wilderness area etc. The most important element of nature is the forest which caters the need on the basic of fire wood, food, fodder, medicine, wood





for building and raw materials etc. Big River Valley Projects generally have the effects on climate change and an increase in the fragility of natural eco-system, soil erosion, and air and water pollution. Ecological impacts are associated with the river basin development on aquatic life including fish, aquatic plants and organisms that transmit human diseases. Reservoirs devastate unique natural areas, existing potential parks, wild life reserves and important historical and archaeological sites. It also destroys natural features of free flowing rivers, waterfalls, canyons and rare plant communities' permanently. The valuations of environment costs are untouched. It ignores the cultural, social, economic and religious life of the tribal people. Many reservoirs flooded out numbers of people, their ancestral homes and forced them to resettle in poor and environmentally different sites. Induced development displacement of Large Dam Project generates Anti Dam Movements, Tribal Unrest and Maoist Movement in the region.

## References

1. Dasmann, F.R., J.P. Milton and P.H. Freeman (1973), *Ecological principles for Economic Development*, Johan Wiley and Sons Ltd., London, P.252.
2. Hanley, N and C. Spash (1993), *Cost-benefit Analysis and Environment*, Aldershot: Edward Elgar.
3. Mishra, P.K. (2002), "Ecological-economics of Balimea Dam Project in Malkangiri district of Orissa, Unpublished thesis. PIP report on detail information area and population affected.
4. Sambad 25<sup>th</sup> August 2010, Wednesday, Jeypore.
5. Dasgupta, A.K. and D.W. Pearce (1972), *Cost-Benefit Analysis: Theory and Practice*, London, the Macmillan Press Ltd, 270 PP.
6. Pradhan, K.(2007) ,"Malkangiri Dastabij" Malkangiri.
7. Mishra,P.K. (2016), "Dammed Rivers and Damned Tribals : A Controversy Towards Indira Sagar National Project (Polavaram)" In *Tribal Studies: A Journal of COATS*, June, Vol.- 4, Issue-2, ISSN, 2321-3396.
8. The Hindu, "Final approval for Polavaram Project erroneous: Orissa," 5<sup>th</sup> Sept. 2010 Sun Day.
9. The Sambad "Polavaram Pain Khandadharare Juluchhi Malkangiri" 25<sup>th</sup> August 2010, Wednesday.
10. The Hindu, "Final approval for Polavaram Project erroneous: Orissa," 5<sup>th</sup> Sept.2010 Sun Day.
11. Mahapatra, P.K. (1970)," Koya" Adibasi Vol.XI No.-4, ST& SC Tribal Research Bureau, Bhubaneswar.
12. Sahu, M. (1998), *Malkangiri Itihas*, Gayatri Kutira Publications, Malkangiri, p. 117. 14. Mahapatra, P.K. (1964)," Hand book on Koya" Adibasi Vol.XI No.-4, ST& SC Tribal Research Bureau, Bhubaneswar.
13. Mohanty, P.K. (1958), "Koyara Samajika Jibana"(Odia, Social life of Koya),Adibasi, Vol.-11,No.-2, ST& SC Tribal Research Bureau, Bhubaneswar.