



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Environmental and Social Issues and Concerns of Indira Sagar Project (Polavaram Dam)

Nagaraju Chikkala¹, K. Anil Kumar²

¹Dr. Nagaraju Chikkala, Programme Coordinator, AP Society for Social Audit Accountability and Transparency (APSSAAT), Department of Rural Development, Govt of Andhra Pradesh, Guntur

²Dr. K. Anil Kumar, Assistant Professor, Discipline of Anthropology, School of Social Sciences, Indira Gandhi National Open University, New Delhi

Abstract

Indira Sagar Project (Polavaram Dam) the largest in history, about to complete in Andhra Pradesh, brings with it many social and environmental concerns. The project has displaced many tribal communities, putting strain on the social fabric of the area and, in the process, drawing our attention to issues of structural violence. In terms of environmental concerns, the Indira Sagar Project makes the area far more vulnerable to ecosystem disruption through erosion and landslides, among other things. This study explores the implications of the Indira Sagar Project in the context of environmental and social issues. In this paper an attempt has been made to understand the historical and physical background of the Indira Sagar Project and extent of land acquisition for the project. The emphasis here is to know the nature, extent of submergence of the total area and magnitude of population displacement. The paper also deals with the response of displaced people, local organization, political parties, NGOs, and civil societies against the project.

Keywords: indira sagar dam, population displacement, land submergence, environment and social implications, agitation.

Introduction

India's first Prime Minister Jawaharlal Nehru while inaugurating Bhakra Nangal Dam on 8 July 1954 proclaimed that the dams were the temples of modern India. Dams are the main source of hydropower and provide irrigation facilities to the field. They provide water for industries and drinking water for human consumption. By controlling floods, dams minimize the damage caused by rains and rivers. The World Commission on Dams, 2000 report says that dams have been promoted as an imperative means of meeting perceived needs for water and energy services and as long-term, tactical investments with the capacity to deliver multiple benefits. One third of all countries of the world depend on hydropower for more than fifty per cent their electricity supply. Large dams generate 19% of electricity overall. Half the world's large dams were built mainly for irrigation, and some 30-40% of the 271 million hectares irrigated worldwide depend on dams.

The World Commission on Dams, 2000 report concluded that the 'end' that any project achieves must be the sustainable improvement of human welfare, which means a significant advance of human development on a basis that, is economically viable, socially equitable and environmentally sustainable. If a large dam is the best way to achieve this goal, it deserves support. Where other options offer better solutions, they should be favoured over large dams. Thus the debate around dams challenges views of how societies develop and

manage water resources in the broader context of development choices. The proponents of dams point to the social and economic development demands that dams are intended to meet, such as irrigation, electricity, flood control and water supply. And opponents point to the adverse impacts of dams, such as debt burden, cost overruns, displacement and impoverishment of people, destruction of important ecosystems and fishery resources, and the inequitable sharing of costs and benefits.

Large dams over 10-15 meters became possible with modern engineering practice in the 1850s. Between Independence and the mid-1990s India had 4,129 large dams and associated large-scale irrigation projects, either completed or under construction (Stewart and Rukmini, 2006). Indira Sagar Project (Polavaram) is one of the largest dams under construction in the State of Andhra Pradesh.

The Indira Sagar (known as Polavaram) project is a major multipurpose irrigation project which is constructed on Godavari River, close to Ramayyapeta village of Polavaram mandal in West Godavari district, Andhra Pradesh. The Indira Sagar Project is the most awaited major irrigation project for many decades. Most Central and state-based political parties have given priority to construction of this project across the Godavari River. The construction of Indira Sagar dam is a political and controversial issue involving political parties, civil society organizations, independent researchers and NGOs. Though, many people are agitating against it and there is much opposition but finally work on the project has gained momentum in the year 2004. The Andhra Pradesh State Re-organization Act, 2014 declared the project as a national project in March 2014 (Government of India, 2014).

History of Indira Sagar Project

The Indira Sagar Project (Polavaram) was conceptualized even before the state of Andhra Pradesh was formed. The first barrage of the project was built in the 19th century by Sir Arthur Cotton near Dhawaleswaram, a few miles downward from Rajamundry. The first proposal of Indira Sagar project came in 1941. Diwan Bhadur L. Venkata Krishna Iyer, the then chief engineer for irrigation department, made a definite proposal for the storage reservoir across the main Godavari River near Polavaram. The full reservoir level (FRL) was planned to be 150 ft and the approximate water storage was 150 tmc. And the entire project was estimated to cost about Rs. 6.40 crore. Since 1942 many changes have been made in the project proposal with regard to dam height and storage capacity.

The preliminary investigation on the project was taken up during 1942-1944. The project was named Ramapada Sagar project. The preliminary investigation and planning, which started in 1942, was completed by the end of 1944. At first the FRL was proposed to be 170 ft and the storage capacity was fixed at 340 tmc. Later FRL was raised to 208 ft under the final design. The power demand too was first raised from 75 MW to 100 MW, and to 150 MW. Before selecting Polavaram, as many as 13 possible sites were investigated and finally a spot closer to the present site was selected. A detailed investigation of the project was done and the design was prepared in 1946-47. In the design and construction of cofferdam, and dewatering of foundation, a consulting board of top ranking engineers of international repute was involved. In the meeting of the consulting boards held in August 1947, under the chief engineer N. Govindaraja Aiyengar, the experts expressed unanimous view that the “construction of the dam is unquestionably feasible.” The committee also agreed that the “selected site for the dam is the best available.” The total cost of the project was estimated to be Rs. 129 crore (1947-48 rates). However, the project could not be pursued mainly because of doubts about the geological stratum at the proposed site which was considered not strong enough to support such a high dam. In 1951 Sir S.V. Rama Murthy drew up a grandiose scheme requiring construction of a 130 meters dam near Polavaram and an extensive network of irrigation canals (Water Resources Department, GoAP, 2017).

However, after the disastrous floods in 1953, a rethinking had begun on the project. This prompted formulations for construction of the dam at the entrance of the gorge near Ippur situated 56 km of Polavaram. In November 1965, a technical committee headed by A.C. Mitra recommended construction of barrage at Dowlaiswaram instead of at Polavaram to serve irrigation either side of the land’s right side and left side (<http://polavaram.apegov.com> 2018).

After the formation of separate states in 1956, the interest in the project was revived because of disputes in sharing river waters. After settling the claims and counter-claims of the riparian states under the auspices the Godavari Water Disputes Tribunal (GWDT) constituted by the Government of India in 1969 to resolve such disputes among basin States and all attempts for an amicable settlement between the party States proved futile

(<https://irrigationap.cgg.gov.in/wrd/static/approjects/polavaramnew.html>, 22nd Feb 2018).

The Andhra Pradesh Government had made out a case before the tribunal for construction of river control near Polavaram. In June 1970, the Andhra Pradesh Government submitted a project report for Polavaram barrage scheme with FRL of +145 ft and a minimum pond level of +45 ft with two canals on either side to supply water on the right side up to Krishna River and on left side up to Vizag port city. After considering all options, a project was formulated in 1978, and was submitted to the Central Water Commission (CWC) for the construction of an earth-cum-rock-filled dam at the present site, Ramayyapata village. The proposed dam had the following dimensions:

- FRL: +150 ft,
- Storage capacity: +145 ft tmc
- Ayacut: 11.90 lakh acres.
- Left canal: 205 km with ayacut 4.67 lakh acres.
- Right canal: 176 km with ayacut 2.99 lakh acres.

Polavaram has undergone change of names by four different governments over the years. “Sriramapada Sagar”, “Sri Sita Sriramapada Sagar”, “Polavaram” and “Godavari Srujala Sravanti” are the names that have all been used for the project (Water Resource Department, GoAP, 2017).

The project was revised in 1982, providing for the dam, the left main canal and power house at an estimated cost of Rs. 884 crore. Subsequently a report for the Right Main canal was prepared in 1984, which estimated the cost of Right Main Canal to be Rs. 398 crore. The entire scheme was sent to the Central Water Commission (CWC) for their scrutiny in 1985. After hearing the comments of experts, the plan was modified in 1986 and was again submitted to the CWC in 1987 with updated estimates. Taking the comments and suggestions of the CWC a revised project report (of 1989-90) was prepared, which estimated the cost to be Rs. 3,030 crore. As soon as the Congress Party came back to power in Andhra Pradesh in May 2004, 25 years after the inauguration ceremony, late Chief Minister Y. S. Rajasekhara Reddy of the Congress party, laid yet another foundation stone at Polavaram in November 2004, renaming it as Indira Sagar Project.

The dam was proposed to be constructed straight across the Godavari River 15 km north of Rajahmundry in the district of East Godavari. The planned dam construction level is 150 feet height (47 m). The submergence will stretch along the Sabari River, a tributary to Godavari, up to the borders of Orissa and Chhattisgarh. Despite the lack of clearance from central government agencies and ministries, the then chief minister of Andhra Pradesh went ahead with the foundation stone ceremony for the construction of the Right Main Canal on 8 November 2004 and the endeavour was renamed the Indira Sagar Project. The chronology of marking major events around Indira Sagar project is given in table below as follows:

Table 1 Chronological Background of Indira Sagar Project

Sl. No.	Particulars	Date
1	Original conceptualization of project by the then Madras Presidency	July 1941
2	First survey (by Diwan Bahadur Venkata Krishna Iyer)	Sept 1942
3	Preliminary investigation was taken up and the project was named as Ramapada Sagar (FRL was proposed at 170 ft)	Oct 1942
4	Another survey was conducted and height was proposed at 208 ft	1944
5	A detailed investigation was done and it was proposed to keep height at 198 ft in the first phase and 208 ft in the second and final phase	1946-47
6	Experts committee lead by then chief engineer N. Govindaraya Aiyangar decided to go for the two-phase project	1947
7	Sir SV Rama Murthy proposed a Ramapadasagar scheme with 130 m dam height and a 1,500 MW of power generation capacity, but it was not pursued due to geological reasons.	1951
8	A technical committee headed by AC Mitra recommended a barrage at Polavaram to irrigate uplands	1965
9	Godavari Water Disputes Tribunal was formed	April 1969
10	Andhra Pradesh government named the project Polavaram and made a case before the tribunal for river control work at Polavaram	1969
11	Andhra Pradesh presented a project report for Polavaram barrage with a 145-ft-high dam and two canals	1970
12	Andhra Pradesh submitted another project report to the CWC for construction of a 150-ft-high earth-cum-rock-filled dam.	1978
13	Inter-state agreements with Karnataka, Maharashtra, Madhya Pradesh and Orissa with a dam height of 150 ft	4 August 1978 11 July 1979 2 April 1980
14	Agreements placed before the Godavari Water Dispute Tribunal and finalized	3 April 1980
15	Detailed project report of Polavaram Project completed	1985
16	Project report submitted to the CWC	1987
17	R&R reports prepared by CESS	1996
18	EIA-EMP prepared by Environment Protection Training & Research Institute based on data of 1996	2002
19	EIA-EMP updated by AFC Ltd. Hyderabad during 2005 submitted to MoEF	16 Sept 2005
20	Application submitted to MoEF for site clearance	23 March 2005
21	MoEF-constituted expert committee visited the project site	4-5 Sept 2005
22	APPCB notified for public hearing held on 10 Oct 2005	10 Sept 2005
23	Application for site clearance filed	16 Sept 2005
24	EIA submitted to MoEF	16 Sept 2005
25	Chief Engineer, Indira Sagar Project sought clearance from Member Secretary, Orissa Pollution Control Board.	16 Sept 2005
26	MoEF asks clarifications on EIA	17 Sept 2005
27	MoEF gives site clearance	19 Sept 2005
28	Chief Engineer, Indira Sagar Project writes to District Collector, Malkangiri, Orissa seeking rehabilitation details	29 Sept 2005
29	Public hearing is held at five places in East Godavari, W. Godavari, Khammam, Visakhapatnam and Krishna districts	10 Oct 2005
30	Andhra Pradesh Pollution Control Board grants consent letter to establish the project	18 Oct 2005
31	A presentation given in the expert committee meeting held at MoEF.	19 Oct 2005

Sl. No.	Particulars	Date
32	Replies to the queries posed by the experts submitted to MoEF	20 Oct 2005
33	MoEF clearance	25 Oct, 2005
34	Application for forest clearance	12 Dec 2005
35	Andhra Pradesh High Court hears a batch of writ petitions filed by some political parties, environmentalists, social activists and legal experts opposing the project and the judgment reserved	February-March, 2006
36	Central Empowered Committee (CEC) of the Supreme Court advises Andhra Pradesh government to stop work on the project when it hears objections raised by tribal rights activists and environmentalists	27 April 2006
37	Andhra Pradesh government stops the project works	30 April 2006
38	Central Wildlife board clearance	10 July 2006
39	The CEC of SC tours Andhra Pradesh and visits the project site	29-31 July 2006.
40	TAC of CWC accorded techno-economic clearance for the revised estimated cost of project for Rs. 16,010.45 crore.	4 January, 2011.
42	Indira Sagar project granted national status in Andhra Pradesh Re-organisation Act introduced in Parliament in February 2014 by the Congress-led UPA government at the Centre as a condition for bifurcation of the state. The Andhra Pradesh State Re-organization Act, 2014 declared the project as a national project	March 2014
41	The ordinance, promulgated envisages transfer of seven mandals (talukas) to the residual Andhra Pradesh state for the smooth completion of the Indira Sagar Polavaram irrigation project.	28 May 2015
42	The NCST, GoI visited the project and displaced villages.	26 -28 March 2018
43	Indira Sagar Project entered into Guinness Book of World Records when 32,100 cubic meters of concrete was poured in 24 hours.	7 January 2019

Source: Consolidated from various sources - GoAP Water Resource Department, GoAP, 1985, CEC, 2006, <http://www.sakti.in/godavaribasins/indira-chronological.htm>,

Budget and Benefits of the Indira Sagar project

The dam has potential to provide the following benefits:

- **Irrigation Benefits:** Supply irrigation benefits to 2.914 lakh ha (7.20 lakh acres) in four districts (West Godavari, East Godavari, Visakhapatnam and Krishna Districts) in Andhra Pradesh;
- **Electricity Generation:** Generation of 960 MW of hydro-electric power;
- **Water Supply:** Industrial water supply for the Visakhapatnam Township and Vishakhapatnam Steel Plant through the left canal. Domestic water supply to villages and towns en-route, besides indirect benefits such as development of Pisciculture.
- **Diversions:** Diversion of 80 tmc of water through the right canal to Krishna river to augment the supplies of Krishna Basin for irrigation purpose;

In terms of budget cost of the major irrigation projects, Stewart and Rukmini, (2006) mentioned in their study that all such large projects end up costing much more than original estimates and the Indira Sagar project is not exempted. A conservative end cost estimate of Indira Sagar project based on a completion date of around 2015 gives a range of between Rs 33,000 crore and Rs 52,000 crore. Another reasonable but less conservative cost estimate is a range of between Rs 72,000 crore and Rs 86,000 crore. These larger estimates could still increase substantially should the dam take 20 or 30 years to complete, (Water Resource Department, GoAP, 2017).

Social Issues and Concerns

Displacement of Population:

According to the official figures, 371 villages will be directly affected by the Indira Sagar project. The project will displace 1,05,601 families, of which tribal families are 55,113 (52.2%). In the project area, 4,069 families from 15 villages have been rehabilitated in new villages; the remaining 101,532 families from 356 villages are yet to be rehabilitated (Table 2).

Table 2 Details of Project Displaced Families and Submergence Villages (as of March 2017)

Contour level	Storage capacity at the contour level	Total PDFs to be rehabilitated		PDFs rehabilitated so far		PDFs Yet to be Rehabilitated	
		Total Villages	Total PDFs	Total Villages	Total PDFs	Total Villages	Total PDFs
+35.00 M	30 tmc	27	9204	15	4069	12	5135
+41.15 M	120 tmc	64	11552	-	-	64	11552
+45.72 M	194 tmc	280	84845	-	-	280	84845
		371	105601	15	4069	356	101532

Source: CAG, 2018, <https://cag.gov.in>, with consolidated (Source: Records of the Commissioner (R&R), Vijayawada

Official government reports and studies by bodies such as research institutes, individuals, NGOs, agencies and civil society organizations show different figures on human displacement and submergence of human habitations due to Indira Sagar project. According to the Reddy, N.S (1996), total 276 villages are affected by the project housing 1, 77,275 people consisting 44,574 households. The project involves submerging 28,336 cattle sheds, 69,255 productive trees. Of these project-affected people, 47% are scheduled tribes and 14.4% are scheduled castes. And the IEA, 2005 mentioned based on the information extrapolated from the 2001 Census of India, total affected population is 1,70,000. Of the total, scheduled tribes (47%) and scheduled castes (14.4%) and the total affected villages are 157. It is reported that over 276 villages in the state of Andhra Pradesh are likely to be submerged. In Odisha 10 villages and in Chhattisgarh 7 villages are going to be submerged. The total submerging villages in this project are 293 (Reddy, N.S, 1996).

According to a study by Agricultural Finance Corporation Limited based on the 2001 Census, a total of 2,36,834 people are affected by the project, of which the male constitute 1,17,321 and the female 1,19,513. Among them, 53.17 per are tribals. Tribals and dalits together account for 65.75 per cent of the displaced population. The natural resources, cultural systems, and traditional knowledge of all these people are closely tied to the land they inhabit (Table 3).

Table 3 Statistics on Affected Villages as per Census 2001

Sl. No	Details	Statistics
1	The total population of the Project affected villages	2,36,834
2	Number of males	1,17,321
3	Number of females	1,19,513
4	Sex ratio	1019 females for every 1000 males
5	S.C. population	29,796 (12.58%)
6	S.T. population	1,25,934 (53.17%)

Source: GoAP & AFC. (2005).

The details of affected households with the social category, the total households are 44,574. Out of the total households, 47.36% are tribals followed by other caste are 19.20%, BCs are 17.21% and SCs are 15.42% (table 4).

Table 4 Statistics on Project Affected as per Census 2001

Total PAF households	44,574
ST	21,106 (47.36%)
SC	6,875 (15.42%)
BC	7,670 (17.21%)
OC	8,557 (19.20%)

Source: Source: GoAP & AFC. (2005).

The inhabitants of 276 habitations (147 revenue villages and 129 hamlets) spread over nine mandals in two districts face displacement because of the project. Among all the nine mandals¹, the greatest extent of displacement occurs in Kukkunur and Kunavaram mandals. The least affected is Boorgampadu mandal. About 75.67% of the affected population (8,818 out of 11,654) in Chintoor mandal belongs to Scheduled Tribes. Among the affected population of Polavaram mandal, 61.11% belongs to Scheduled Tribes. A research study done by CESS (1996) reveals nearly two-thirds of the affected population is concentrated in the four mandals of Kukkunuru, Kunavaram, Chintoor and Velairpadu. Most of the affected land is concentrated in Kunavaram and Kukkunuru mandals which together account for 40 percent (30,000 acres) of the affected land (CESS report, 1996 & Reddy, N.S. 2006). The dam is expected to displace more than 200,000 people, the highest ever by any dam in the country. A majority of the villages that would be submerged fall in Fifth Schedules areas where adivasis enjoy special rights. At least 63,691 hectares of forestland in Telangana, Andhra Pradesh, Chhattisgarh and Odisha would be submerged by the project. The distribution of affected population in the submerged mandals is furnished in the table with the percentage as follows:

Table 5 Statistics on Project Affected as per Census 2001

Name of the Mandal	Percentage of affected Scheduled Tribes	Percentage of affected Scheduled Castes	Percentage of affected Backward Castes	Percentage of affected Forward Castes
Chintoor	75.67	2.78	12.18	9.38
Polavaram	61.11	10.82	13.62	14.45
Velairpadu	54.13	14.24	17.15	14.48
V.R. Puram	53.23	4.14	37.35	5.28
Devipatnam	51.80	8.30	20.83	18.87
Kunavaram	51.33	13.77	22.00	12.91
Bhadrachalam	28.61	22.92	25.91	22.55
Kukkunur	21.46	29.59	25.00	23.96
Burgampadu	13.08	39.08	29.90	17.94
Total	45.60	16.18	22.66	15.54

Source: CESS, 1996

The CESS report (1996), also says 15,105 households will be displaced by the canals. Assuming that a household has an average of 3.98 members, 15,105 households displaced by the canal represent a population

¹ After bifurcation of the United Andhra Pradesh State, an ordinance was issued on 28 May 2015 under the Andhra Pradesh Reorganization Act 2014 that seven mandals from Telangana have been merged into Andhra Pradesh state for R&R the smooth functioning of R&R.

of 60,118. But, the total project-affected persons mentioned above under-represents the actual population of project-affected persons so adjusting by the same percent indicates that there will be 80,316 canal displaces. The number of actual displacees from the submerged reservoir and those displaced by the canals is 2,36,834 plus 80,316, or 317,150. Apart from the implications of that trend, there are other factors that suggest that the figure of 3,17,150 is an underestimate of the number of people who will be displaced if the Polavaram Dam is constructed:

1. The average number of members in a family is taken to be 3.98. This figure may underestimate the average family size. The CESS report of 1996 found the figure to be 4.21, which would add about 33,500 people.
2. No account has been taken of the effect of backwaters, wave heights or periodic flooding on submergence. The CESS report of 1996 claims that a government document suggested the 160 foot contour – rather than the 150 foot – is a better measure to account for this effect. A very rough calculation using the ratio 160:150 – probably a large underestimate – adds another 21 000 people.
3. If one adds the estimate of 3,17,150 people above to the figures mentioned at (1) and (2) of 33,500 and 21,000, the total number of displacees now becomes 3,71,650.
4. The population increase since the 2001 census applied to the displacees numbers would produce a total of well over 4,00,000 displacees.

Agitations against the Indira Sagar (Polavaram) project

Several organizations in Andhra Pradesh and elsewhere have launched agitation against the proposed Indira Sagar project. The agitation is bound to get stronger with time due to the huge impact of the project and the undemocratic, high handed attitude adopted by the centre and the state governments: Some of the organizations are:

- Polavaram Project Nirvasitula Parirakshana Samiti
- Adivasi Student Federation
- Andhra Pradesh Girijana Sangham
- Adivasi Kondareddy Sangam
- Polavaram Project Nirvasitula Committee
- Polavaram Project Vyathireka Ikya Poratta Vedika.

The above organizations with the support of CPM, CPI, local civil society organizations, NGOs, independent social activists, legal advisors and others have been conducting several massive agitations like massive march, rasta roko, mobbing, mobbing of government officials at block/mandal level against the construction of dam. Initially, the movement was influenced by the affected populations in the project area; later it received much support from environmental activists and independent researchers. Many researchers conducted impact studies on Indira Sagar project and suggested the Government of Andhra Pradesh take necessary actions to safeguard the ethnic tribal communities in the project affected areas.

Massive Agitation Organized by CPI (M) turns Violent:

On 29 January 2007, the CPI (M) gave a call for laying siege to the revenue offices of the mandals which come under the submersion area of the Indira Sagar project. They were demanding the government to stop survey works of Indira Sagar project, withdraw cases against the people in connection with the movement of the oustees under the proposed project and give pattas to the tribal people on lands they had been cultivating.

As a part of this struggle, the oustees of the Indira Sagar project took out a procession in Bhadrachalam on January 29 to submit a memorandum to the sub-collector. The police, who were deployed on a large scale to foil the agitation, obstructed the people at several places and refused permission to hold dharna and meet the sub-collector. Imposing prohibitory orders, the police resorted to indiscriminate lathi-charge on the agitators, including women, who were sitting on the road. The police used tear gas shells, fired into the air and started arresting the agitators. Protesting the police repression, thousands of oustees reached Bridge centre and stopped the traffic (rasta roko). Here, again, the police resorted to lathicharge without any warning and under the direction of the Additional Superintendent of Police Ramesh Babu, the police resorted to firing for about

20 minutes. Kunja Narsayya of Madhavaopet sustained bullet injuries in the left knee and Madakam Narayana, Macha Pullayya and Srinivasachary sustained severe injuries. Several people sustained injuries in the lathicharge. The police arrested CPI (M) MP, Dr. Midiam Babu Rao, Bhadrachalm division secretary Bandaru Ravikumar, ZPTC member G Sarath and others from the Polavaram project. Cases were registered against them. (Venugopala Rao, M, 2007).

Konda Reddy Tribes Resist the Indira Sagar Project:

The Adivasis are the main victims of the Indira Sagar project as they constitute 52% of the population impacted by the project. Among them, the predominant group is that of Konda Reddy, a particular vulnerable tribal groups (PVTGs). According to official sources, around 7,445 Konda Reddi tribal people belonging to 2,446 households have been living in as many as 83 habitations comprising more than 20 hilltop habitations in Kunavaram, Chintur, V R Puram, Velerupadu, Aswaraopet and Dammampeta mandals in the Bhadrachalam Agency (The Hindu, 2014). The Konda Reddy tribes in the project affected area have formed an Adivasi Konda Reddi Sangham (Association) and resisted the project to protect their traditional livelihoods and distinct cultural heritage alive. The adivasis are afraid of being evicted from their place of origin to unknown areas.

The Sangham intensified the anti-Polavaram agitation demanding shelving of the Indira Sagar (Polavaram) project in Bhadrachalam agency. The members of the Sangham took out a rally and staged a dharna in front of the ITDA office in Bhadrachalam on 11 February 2014 (Source: The Hindu newspaper, 2014). “Konda Reddis have been living in the hilly and forest tracts of the Bhadrachalam agency since time immemorial and the attempts to force them to abandon their natural habitat in the name of Polavaram is atrocious,” said Murla Ramesh, the founder of the Sangham.

Adivasis Protest the Polavaram Ordinance:

Following the bifurcation of the Andhra Pradesh state, under the Andhra Pradesh State Re-organization Act, 2014, the Center promulgated an ordinance in 2015, for transfer of a cluster of mandals and villages in Khammam district to the successor state of Andhra Pradesh for the purpose of Polavaram project. The ordinance, promulgated on May 28, envisages transfer of mandals to the residual Andhra Pradesh state for the smooth completion of the Indira Sagar Irrigation project.

- Five mandals are transferred completely: Kunavaram, V R Puram, Chintur, Kukunoor and Velerupadu are completely
- Two mandals are transferred partially: Bhadrachalam and Burgumpadu.

The dam will submerge 74 gram panchayats, 193 revenue villages in Khammam. Out of the 339 tribal settlements that will be submerged in Andhra Pradesh, 264 are located in the Schedule Five areas of Bhadrachalam and Palvancha revenue divisions of Khammam (Down To Earth: 2015).

“The Centre has not sought consent of the gram sabhas concerned before promulgating the ordinance hurriedly. It violates the rights of adivasis living in Schedule Five areas,” said Vattam Narayana Dora, convener of Polavaram Project Vyathireka Ikya Poratta Vedita, an umbrella organization of many adivasi groups fighting the project. The BJP-led government at the Centre promulgated the detrimental ordinance bypassing the constitutional safeguards meant for Adivasis, stated Sunnam Rajiah, adivasi leader belonging to Communist Party of India (Marxist) and member of Telangana Legislative Assembly. He and a dozen MLAs from the seven mandals have started indefinite hunger strike in Bhadrachalam, (Down To Earth, 2015). Although the adivasis and all affected people conducted mass rallies and opposed the Polavaram ordinance, it came in to force in 2015.

Relay Hunger Strike held by The Polavaram Project Nirvasitula Committee:

The Polavaram Project Nirvasitula Committee organized a relay hunger strike for more than a month at the Polavaram Mandal Headquarters in the year 2016. The committee has been formed with all the affected tribal families in the Polavaram mandal. They demanded compensation on Podu lands, household compensation to girls who attain 18 years as per the RFCTLARR Act, 2013, allotment of house sites, and allotment of lands under land for land compensation.

'Agency Poru Yatra' marched with hundreds of tribals held by Andhra Pradesh Girijana Sangham, a CPI(M)-affiliated tribals' body have conducted:

Andhra Pradesh Girijana Sangham, a CPI (M)-affiliated tribals' body, have conducted a march with hundreds of tribals across villages in West Godavari district being submerged due to Indira Sagar project (dam). The tribals are asking the government to provide forest "pattas" (rights) for their "podu" lands, and proper resettlement and rehabilitation under the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (LARR) Act, 2013. The march, Agency Poru Yatra, was followed by a massive protest on July 16, in front of the district collectorate in Eluru. The march has started from July 10 and ended on July 16, 2018 (News click, July 2018).

Protest & Agitation against the low quality construction of R&R houses:

Many associations of Polavaram Affected People Committees (Tribal Protests) organized protest against low quality construction of houses for three days at the new R&R sites in the L&D Peta from 22 to 24 October 2018. Displaced people from 19 villages in the Polavaram mandal participated in the mass mobilization. The Government of Andhra Pradesh has given contract to the local contractors for construction of R&R house in the new location. In respect of quality of houses, the affected people have noticed that the quality of construction is very poor and the contractors are in a hurry to complete the colonies and not bothered about quality.

As per the RFCTLARR Act, 2013, the displaced families are given a choice of model of house to choose; if the house is expensive, the beneficiary has to pay the excess amount above the standard rate. The Government has given contract to builders for constructing houses for the tribal oustees. As many oustees feel the houses are unsuitable and are low in quality, they want to construct houses on their own or want village committees to monitor the construction of new houses. The Government of Andhra Pradesh has agreed to their demands. The Government has also provided free public transport to the village committees to monitor the construction of R&R colonies (Eenadu, 23 Oct, 2018).

Role of NGOs & Civil Society Organizations

NGOs and civil society organizations have played an important role in the areas affected by Indira Sagar project by projecting the problems and concerns of PAPs, especially tribals and dalits. The Polavaram project has been a contentious one. C. Ramachandraiah and A. Venkateswarlu (2014) argued in their study that many officials and middlemen used pressure and threats to acquire land. They reduced gram sabhas to powerless bodies due to the ignorance of the villagers. Civil society organizations, advocacy groups and public spirited individuals played an active role in raising awareness among the affected people regarding their own land rights.

Ramachandraiah and Venkateswarlu (2014) pointed out that there is a lot of misinformation on the displacement of people due to the project. People affected by the project have been raising voices of dissent and resentment occasionally. Government officials provided little information or at times, even misinformation, when they came to gram sabhas. When the people of Chatti village in Chintur mandal of Khammam district refused to give their approval in grama sabhas, the officials concocted the approval.

Human rights groups are opposed to the displacement of such a large number of tribal people from their habitations (Balagopal, 2006; Trinadha Rao, 2006; Shukla, 2006; Mohan, 2006; Vidyasagar Rao, 2006). It is

feared that about 1.06 million people in 10 towns, including Rajahmundry city, and 3.1 million rural people in 50 mandals from West and East Godavari districts have to live in perpetual anxiety about their as well as the dam's safety, in case the Indira Sagar (Polavaram) dam breaks (Shivaji Rao, 2006).

Though several agitations and massive protest are being raised by the people affected by project, tribes and other traditional forest dwellers, against the construction of the dam, the state government is giving prime importance to completing the dam by 2019. In the first phase of implementation of the R&R, many displaced population have raised their voice that many of displaced families have not been paid full compensation on their loss of assets.

Environmental Issues and Concerns

Land Acquisition for the Project:

The Water Resource Department, GoAP, published on its website on 21 October 2018, the status on land acquisition and project displaced families in the project affected area:

In West Godavari, East Godavari, Visakhapatnam and Krishna districts the total submerged area involved was 1,66,423.2 acres. The break-up of submerged districts was as follows:

- East Godavari 63.9%,
- West Godavari 31.5%,
- Vishakhapatnam 2.5%
- Krishna 2.1%)

The number of families displaced estimated are 1,05,601. The break-up of PDFs are as follows:

- East Godavari 67.2%
- West Godavari 32.8%

The Government has acquired 1,10,095.1 acres (66.2%) of land, for which it has paid Rs 5,214.35 crore as compensation. The land yet to be acquired is 56,328.18 acres (33.8%). The government has paid a compensation of Rs 391 crore to 3,922 project-displaced families (PDFs), which is 3.7% of all displaced families. The remaining PDFs of 1,01,679 are yet to be paid compensation of Rs. 20,081 crore.

According to the Comptroller and Auditor General of India Report (CAG), 2018 the land required for the project is 1,65,431.47 acres. Of the total, submergence area is 1,03,585.21 acres. Land required for project displaced families and resettlement and rehabilitation colonies are 37163.93 acres. Land for works including head works, canals etc. is 24,682.33 acres.

Land acquired as per Andhra Pradesh Rehabilitation and Resettlement policy, 2005 following section 17 of Land Acquisition Act, 1894; the total 86,194.45 acres have acquired and expenditure incurred Rs. 1,106.56 crore. Subsequently the Government of Andhra Pradesh under the Right Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCTLARR Act, 2013) acquired 16,397.67 acres of land, incurring an expenditure of Rs 3,096.37 crore. The balance of land to be acquired is 62,839.35 acres and estimated cost is Rs. 6,823.83 crore.

Various research studies done by academicians, agencies and civil society organizations give different figures on land acquisition. The area of submersion of the project is 637 km²; 601 km² in Andhra Pradesh, 24 km² in Chhattisgarh and 12 km² in Orissa (GoAP Water Resource Department). The project submerges 52,623.91 ha. of area, based on the dam's 150 foot contour or full reservoir level, out of which 48,790.520 ha is non-forest area and 3,833.39 ha is forest area. The submergence zone in Andhra Pradesh consists of farmland, poramboke (common land or government land), and reserved forest lands. The report also says additional residential households land will be affected by the major canal infrastructure. The number of villages that will submerge is 296; of these 276 are in AP, 10 in Odisha and seven in Chhattisgarh (Table 6).

Table 6 Project Submergence Areas

State	Non-forest Area (ha)	Forest area (ha)	Total (ha)
Andhra Pradesh	47,449.200	3731.07	51,180.27
Chhattisgarh	795.43	0.16	795.59
Odisha	545.89	102.16	648.05
Total	48,790.520	3,833.39	52,623.91

Source: CEC Report, 2006.

The break-up of the forest land and the non-forest land for various items of works is as under:

Table 7 Project Submergence Areas

Submergence		Forest land (ha)	Non-Forest Land (ha)
Andhra Pradesh		3,398.00	42,193.00
Orissa		102.16	545.89
Chhattisgarh		0.16	795.43
Total		3,500.32	43,534.32
Head Works	Andhra Pradesh	134.11	307.65
Right Main Canal	Andhra Pradesh	87.18	1,193.87
Left Main Canal	Andhra Pradesh	111.78	3,754.68
Total		3,833.39	48,790.520
Grand Total		52,623.91 ha.	

Source: CEC Report, 2006.

As per the project authorities, the project involves submergence of 187.29 ha of forest area falling within the Papikonda Sanctuary {Central Empowered Committee (CEC) Report, 2006}.

Environmental Clearance Process:

Application for site clearance was submitted to the Ministry of Environment and Forests (MoEF), Government of India, on 23 March 2005. The ministry sought some clarifications on site clearance and was instructed to submit a revised application on 14 July 2005. Revised application form in the prescribed format for site clearance was submitted on 29 July 2005. The MoEF constituted a committee of experts to visit the site of Indira Sagar (Polavaram) project on 31 August 2005. The expert committee visited the site from 4 to 6 September 2005 and the Ministry granted the site clearance later. An Environment Impact Assessment (EIA) and Environment Management Plan (EMP) was prepared and the same have been submitted to the MoEF clearance (CEC, 2006).

The site clearance has been accorded by the MoEF (Ministry of Environment and Forests) on 19 Sept 2005. After holding the public hearing on 10 Oct 2005, the MoEF accorded the environmental clearance on 25 Oct 2005. After giving a month-long notice in all leading dailies, Andhra Pradesh Pollution Control Board conducted a public hearing on 10 October 2005 in five districts of Vizag, East Godavari, West Godavari, Khammam, and Krishna. Andhra Pradesh sought the approval under the Forest Conservation Act, 1980 for the use of the forest land on 12 Dec 2005. As regards the forest land falling under Chhattisgarh and Odisha, the formal proposal seeking approval under the F.C. Act have not been filed by these two States. These states have also objected to their lack of involvement in the public hearing (CEC, 2006; Biksham Gujja, S. Ramakrishna et al: 2006).

As Andhra Pradesh had launched the Indira Sagar project even before obtaining environmental and other statutory clearances from the Government of India, Andhra Pradesh High Court ordered stay on the project. But the State Government interpreting that the stay pertains only to the barrage component of the project, continues to go ahead with the works connected with left and right canals.

The Chief Wildlife Warden of Andhra Pradesh Forest Department has recommended the use of the forest land falling within the wildlife sanctuary on the condition that the laborers working in the project area should not depend on the forest for their housing material and fire wood needs and that an equivalent reserve forest area will be included in the sanctuary. The State Board for Wildlife (SBWL) in its meeting held on 9 January 2006 under the Chairmanship of Chief Minister, Andhra Pradesh, has recommended the project for clearance. The Standing Committee of the National Board of Wildlife in its meeting held on 6 July 2006 examined the use of the forest land falling within the sanctuary and has recommended the project for approval (CEC, 2006).

For monitoring of compliance with Environment/Forest clearance conditions, the Government of Andhra Pradesh has formed a committee in 2009. This committee has been set up for independently monitoring the implementation of forest clearance conditions given by Government of India. While according environmental clearance (October 2005) and Forest Clearance (in-principle approval in December 2008 and final approval in July 2010) for Indira Sagar project, the MoEF had stipulated certain conditions to the department. As per the conditions of forest clearance (December 2008), the project area shall be demarcated on ground at the project cost using four-feet high concrete pillars inscribed with serial numbers. Audit observed that though the final approval of forest clearance was granted by the Government of India in July 2010, the demarcation was not completed even on July 2017. Out of 3,229 pillars to be erected for demarcation of the Catchment Area only 1,490 RCC pillars were erected (May 2017) leaving a balance of 1,739 (54 per cent) pillars yet to be erected.

As per the environmental clearance (EC) conditions, the department was to implement Catchment Area Treatment Plan (CAT) in 34,500 hectares of area. The CAT involved the following:

- biological/vegetative treatment: afforestation/ re-vegetation, social forestry and vegetative barriers.
- engineering treatment: construction of gully plugs, rockfill dams, percolation tanks, check dams and contour trenches.

For implementing CAT, the Water Resource Department had deposited (August 2009) an amount of Rs. 21.05 crore with the state forest department. The audit observed that there was no progress in implementation of vegetative treatment as of March 2017. In respect of engineering treatment, the progress was only 6.44 per cent as of July 2017 (CAG Report 2018).

Archaeological Aspects:

Biksham Gujja, S. Ramakrishna et al, (2006) mentioned that the submergence area of Polavarm project has been thoroughly investigated by the Department of Archaeology, Hyderabad, and submitted a detailed report for rehabilitation and reconstruction of archaeological monuments and temples during 1987. Further, an expert from the Archaeological Survey of India has visited the Indira Sagar project site, as a member of the experts committee constituted by MoEF from 4 September 2005 and issued the no-objection certificate for the project on 9 September 2005. The retired chief engineer for the CWC in Hyderabad said in 2005 that the 1989-90 submission to the CWC had not responded to its 1987 comments. In response, the CWC said they could not clear the project. Inexplicably, with 45 of the 72 comments still not addressed after 20 years, the government of AP is digging the canals without CWC permission and other necessary clearances having been obtained.

Discussion

The Indira Sagar multipurpose project, after a long wait of many decades (more than 70 years), picked momentum in 2004 when construction of the dam started. The project is aimed to provide irrigation to 2.914 lakh ha (7.20 lakh acres) area, in four districts of Andhra Pradesh, namely West Godavari, East Godavari, Visakhapatnam and Krishna. The project has the potential to generate 960 Mega Watts of Hydro-electric Power and other benefits.

Construction of Polavaram dam is in the news on a daily basis. The dam has generated major controversies, criticism, legal challenges, public demonstrations, and political polarizations. Some are already comparing the Polavaram dam with Narmada dam. Some civil society organizations are threatening to launch an agitation to oppose the dam. On the other hand the local people are also agitating by saying that “This is our birth place. How can the government ask us to move away from our Motherland? We will resist the Government”.

The topic of the Indira Sagar (Polavaram) dam has become a controversial political issue; many debates and agitations have taken place by political parties, civil society organizations, independent researchers and NGOs. In spite of many agitations by the people, work on the project gained momentum in the year 2004.

For construction of the dam and for resettlement and rehabilitation of people ousted from their habitation, a land area of 52,623.91 ha was required. Of this area, 48,790.520 ha was non-forest area, and 3,833.39 ha was forest. A total of 296 villages were to be submerged; of which 276 were in AP, 10 in Odisha and 7 in Chhattisgarh.

The project displaced families were not resettled properly. Many of displaced families are not compensated on their loss of assets due to lack of documentary evidences, litigations, dual names and other reasons. The project affected people are not fully aware of the rehabilitation packages being offered and in short the state administration has failed to make the affected people in remote villages understand the implications of the displacement. The people are by and large kept in dark about the adverse impact of the project in their lives.

References

- Balagopal, K (2006). "Tribals' Misery", in Biksham, Gujja, et al. (2006) Perspectives on Polavaram: A Major Irrigation Project on Godavari’.
- Biksham Gujja, S. Ramakrishna et al, (2006). ‘Perspectives on Polavaram: A Major Irrigation Project on Godavari’.
- CAG (2018). Comptroller and Auditor General of India Report on Economic Sector for the year ended March 2017, Report No.4 of 2018, <https://cag.gov.in>.
- CESS (1996). Report on Resettlement and Rehabilitation of the Displaced under Polavaram Project, Centre for Economic and Social Studies, Hyderabad. (Report was prepared under the guidance of Dr.N.Subba Reddy, Professor of Anthropology).
- CEC (2006). Central Empowered Committee (Constituted by The Hon'ble Supreme Court Of India In Writ Petition NO. 202/95 AND 171/96), Gate_No. 3Mawahar Lal Nehru Stadium, Lodhi Road, New Delhi – 110003. Dated : 15.11.2006.
- Down To Earth,(2015). <https://www.downtoearth.org.in/news/polavaram-ordinance-protests-by-advocates-intensify-44574>
- Eenadu daily news telugu paper, October 23, 2018.
- GoAP. (1985). Polavaram Project: Environmental Impact Appraisal Report, Irrigation Department, Government of Andhra Pradesh, Hyderabad May.
- GoAP & AFC. (2005). *Indirasagar (Polavaram): A multipurpose major irrigation project* Volume I: Irrigation and CAD Department, Government of Andhra Pradesh *Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP)*; Volume II: Agricultural Finance Corporation *Resettlement and rehabilitation project affected persons economic rehabilitation plan (PAPERP)* September 2005.

- Government of India. (2014). The Andhra Pradesh Reorganisation Act, 2014, No. 6 Of 2014, Ministry Of Law And Justice, (Legislative Department) New Delhi, the 1st March, 2014/Phalguna 10, 1935 (Saka).
- Mohan, R.V. Rama (2006). "Dams and Displacement: Major Loss, Minor Gains Polavaram Project in AP", Economic and Political Weekly, February 18, 2006, (pp.604-06).
- Ramachandraiah & A. Venkateswarlu (2014). "Land Laws, Administration and Forced Displacement in Andhra Pradesh, India" Centre for Economic and Social Studies, Hyderabad, CESS Monograph No 35, October 2014.
- Reddy, N. S. (1996). Polavaram Project: report on resettlement and rehabilitation of the displaced. Hyderabad, Centre for Economic and Social Studies.
- Reddy, N.S. (2006). "Development through Dismemberment of the Weak: Threat of Polavaram Project", Economic and Political Weekly, April 15 (pp.1430-34).
- Shivaji Rao, T (2006). "Dam Break Threat Uncared", in Biksham, Gujja, et al. (2006). Perspectives on Polavaram: A Major Irrigation Project on Godavari'.
- Shukla, G.P (2006). "Forests are the Most Affected", in Biksham, Gujja, et al. (2006). Perspectives on Polavaram: A Major Irrigation Project on Godavari'.
- Stewart and Rukmini (2006). 'India's Dam Shame: Why Polavaram Dam must not be built', Gramya Resource Centre for Women, Secunderabad 500017.
- Trinadha Rao, P (2006), "Nature of Opposition to the Polavaram Project", Economic and Political Weekly, April 15, (pp.1437-39).
- The Hindu (2014) <https://www.thehindu.com/news/national/andhra-pradesh/polavaram-project-to-hit-konda-reddi-tribals-the-most/article5676784.ece>
- The Newsclick (2018) <https://www.newsclick.in/polavaram-dam-affected-tribes-ignored-both-central-and-state-governments> 18/07/2018
- Vengopala Rao. M. (2007). People's Democracy, Weekly Organ of the Communist Party of India (Marxist) Vol. XXXI No. 05 February 04, 2007.
- Vidyasagar Rao, R. (2006). "Violation of Norms", in Biksham, Gujja, et al. (2006). Perspectives on Polavaram: A Major Irrigation Project on Godavari'.
- Water Resources Department, Government of Andhra Pradesh (2017).
- <https://irrigationap.cgg.gov.in/wrd/home>.
- <https://irrigationap.cgg.gov.in/wrd/static/approjects/polavaramnew.html>, 22nd Feb 2018
- <http://polavaram.apgov.com> 2018