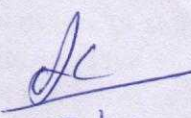


COST BENEFIT ANALYSIS FOR LAYING OF PIPE LINE FOR SUPPLY OF DRINKING WATER FROM WATER TREATMENT PLANT AT ABGILA TO EXISTING STRUCTURES (CONSTRUCTED BY PHED/BUIDCo) SITUATED AT DIFFERENT LOCATIONS IN GAYA & BODHGAYA TOWN UNDER GANGA WATER SUPPLY SCHEME

A. Cases under which a cost-benefit analysis for forest diversion required

S. No.	Nature of proposal	Applicable / Not applicable	Remarks
1	All categories of proposals involving forest land up to 20 hectares in plains (5 hectare in hills).	Applicable	These are cases where a cost-benefit analysis is necessary to determine when diverting the forest land to non-forest use in the overall public interest. In the Present case, the cost benefit analysis for laying of pipe line for supply of drinking water from water treatment plant at Abgila to existing structures (constructed by PHED/BUIDCo) situated at different locations in Gaya & Bodhgaya town under Ganga Water Supply Scheme has been calculated.
2	Proposal for defense installation purposes and oil prospecting (prospecting only).	Not applicable	-
3	Habitation, establishment of industrial units, tourist lodges complex and other building construction.	Not applicable	-
4	All other proposals involving forest land more than 20 hectares in plains and more than 5 hectares in hills including roads, transmission lines, minor, medium and major irrigation projects, hydro projects, mining activity, railway lines, location specific installations like micro-wave stations, auto repeater centers, TV towers etc.	Not Applicable	-




30/11
कार्यपालक अभियन्ता
तिलैया बहर प्रमखन, बजौरगल

B. Estimations of cost of forest diversion

(i) Direct Benefits :-

S. No.	Parameters	Remarks
1	Ecosystem services losses due to proposed forest diversion	NPV Value as per FCA, 1980 is 6.26 Lakhs per Hectare Hence total NPV Value for diversion of land is =6.26 X 2.1109 = 13.21 lakh.
2	Loss of animal husbandry productivity including loss of fodder	Nil
3	Cost of human resettlement	Nil
4	Loss of public facilities and administrative infrastructure (Roads, building, schools, dispensaries, railways, etc.) on forest land, which would require forest land if these facilities were diverted due to the project.	Nil
5	Possession value of forest land diverted	The total area of protected forest land along the project required is 2.1109 ha. The possession value is taken as 30 % NPV=3.963 lakh.
6	Cost of suffering to oustees	Nil
7	Habitat Fragmentation Cost	50 % of NPV Habitat Fragmentations cost is 6.605 lakh.
8	Compensatory a forestation and soil & moisture conservation cost	

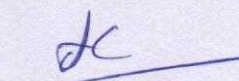
(ii) Indirect Benefits :-

The scheme is proposed to provide drinking water to the water scarce town areas of Gaya and Bodhgaya. As per records of Central Ground Water Board, the ground water level in above cities has shrunk to 5.06 m (approx.) in the last ten year. Religious places such as Vishnupad Temple, Sita kund, Maa Mangla Gauri Temple, Mahabodhi Temple etc in Gaya and Bodhgaya has become devoid of water as a fallout of alarming ground water depletion. The situation became so grave during summer that the residents of Gaya town were supplied drinking water through tanks. It is also noteworthy that ground water depletion is often thought to impact people who use ground water. In fact depletion can also affect rivers, species, ecosystems and surface water users. Declining rainfall and inadequate recharge of ground water and over utilization due to increased population appears to be main reason for decline in discharge in Gaya ponds. Many rivers receive some or even most of their flow from groundwater, particularly during the driest months. In addition, forests are home to diverse and widespread number of groundwater-dependent species and ecosystems, some of which are endangered.

It is proposed to laying of pipeline of required design and dimensions to storage 186.5 MLD water treatment plant (at Abgila, Gaya) as water demand of per capita in Gaya and Bodhgaya. By using, this treated (purified) water by population in Gaya and Bodhgaya, we will save ground water. This will help in increasing of ground water. By increasing ground water, groundwater-dependent species and ecosystems will improved. So this project is useful from the point of view of Forest Department also.

Total Costs (A) = 13.21+3.963+6.605
= 23.778 Lakh.




30/11 अभियंतः
तिलैया बहर प्रमखन, बलीरगढ़


C. Benefits of forest-diversion

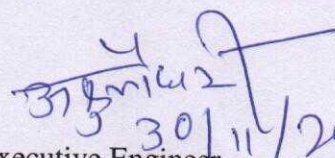
S. No.	Parameters	Remarks
1	Increase in productively attribute to the specific project	In lieu of total trees to be affected in protected forest land it is proposed to be undertaken at least twice of affected trees as compensatory afforestation
2	Benefits to economy due to the specific project	Socio-economic benefit with enormous convenience in drinking water to urban and rural people and animals.
3	No. of population benefited due to specific Project	Population of nearby villages/ towns will be benefited. As per 2011 census, 507053 and after 40 years it may be nearly 1381481
4	Economic benefits due to of direct and indirect employment due to the project	Approximately 100 employees will be working directly/indirectly in the project during entire construction period, about 25 employees will be required during operation phase. Assuming 180 working days, 1.58 years, 500 Rs per day. Total cost = $100 \times 180 \times 1.58 \times 500$ = 142.20 lakh
5	Economic benefits due to Compensatory afforestation	In lieu of total trees to be affected in protected forest land it is proposed to be undertaken at least twice to affected trees as compensatory afforestation. The CA will be about 4.2218 Ha. (Twice of 2.1109 ha for density 1.0 is Rs 126.74 lakh per hectare (As per Forest conservations) Act. Considering density of the present forest as 0.2, cost per hectare is $4.2218 \times 126.74 \times 0.2$ = 107.01 lakh.

Total Benefits (B) = $97.179 + 107.014$
= 204.193 lakh

Benefit to Cost Ratio = $(B)/(A)$
= $204.193 / 23.778$
= 8.59 (>1)

The benefit to cost ratio being greater than 1 (i.e. 8.59) the project is found viable as per analysis.


30.11.2021
SPD/TCSD-2


30/11/2021
Executive Engineer
Tilaiya Canal Division, Wazirganj