

PROJECT COMPLETION REPORT

1. Title of the Project: : **Evaluation of environment friendly control measures of Japanese encephalitis vector in its breeding site in worstly effected region of Sonitpur district of Assam**
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3. Implementing Institution and other collaborating Institution(s): Tezpur university, Napaam, Sonitpur, Pin:-784028 in collaboration with Defence Research Laboratory, Tezpur, Post Bag- 02
4. Date of Commencement: 10/10/2017
5. Planned Date of Completion: 10/10/2020
6. Actual Date of Completion: 31/03/2021

Objectives as stated in the project proposal:

- 1) To relate climatic parameter with occurrence of Japanese Encephalitis of Sonitpur district and to find out the region of Sonitpur, from where clinical record of Japanese Encephalitis has been found to be the most. It will help us in selecting our study site.
- 2) To study the vector control program, whether integrated vector management practices are using or not and evaluation of Alternate wet and dry irrigation technique in rice field for control of JE vector. Hence to study mosquito density as well as larval density throughout the period in study the sites of mentioned region to examine whether these techniques are able to reduce mosquito growth or not.
- 3) To find the variation of water parameters of most favorable habitat with that of the others in epidemic areas and also with the non epidemic areas throughout the whole study period and before and after application of said vector control measure

3) Deviation made from original objectives if any, while implementing the project and reasons thereof: There was a slight modification in the second objective. Neem leaf was applied in the field and in the first year, it was found that it hampered the yield of rice in the field. Hence, that part was excluded from the study in the subsequent years. Moreover, it was planned to organize awareness programmes for the farmers regarding benefits of AWDI, but it could not be done because of the pandemic situation.

7. Experimental work giving full details of experimental set up, methods adopted, data collected supported by necessary table, charts, diagrams & photographs:

The study was carried in Bihaguri (N26°38'10" E92°04'2") Block of public health center of Sonitpur Assam. Adult female mosquito density for Culex species is studied in the sub center. Three sites were selected for study. One is at the cattle shed, one inside the hut and the other one is inside the concrete house of human dwelling. For mosquito density study we used CDC light trap for duration of 12 dark hours. Light trap is installed at about 1.5 m above the floor next to the foot of the bed. Collected mosquitoes were brought to the laboratory for identification. Mosquitoes were killed with chloroform and identified morphologically under microscopes using taxonomic keys (Ref. Tyagi et.,al, A catalogue of Indian mosquitoes, International Journal of Mosquito Research 2015; 2 (2): 50-97) Five genera namely Anopheles, Culex, Aedes, Armigeres and Mansonia were identified. But for our study we only considered Culex species. Culex has three JE potential subspecies Culex tritaeniorhynchus, Culex. vishnui, Culex pseudovishnui. The number of female Culex mosquito for each species collected in each trap is tabulated for each of the study area. The total number of mosquitoes for all the specimens is counted out. After that Relative density was calculated for each of the subspecies of Culex. by using the following formula-

No. of all specimens of each species collected during each period ×100

no. of specimens of all species collected during each period

(Ref. Simsek FM. Seasonal frequency and relative density of larval populations of mosquito species (dipteran culicidae) in Anhurfar Province Tukey.Turk. J zool.2006, 30:383-392)

Operational definitions

Case Fatality Rate

Case Fatality Rate (CFR) is the proportion of deaths within a designated population of “cases” (people with a medical condition like JE and AES), over the course of the disease
 $CFR \% = (\text{Number of deaths} \div \text{Number of cases}) \times 100$

Sample Positivity Rate

$(\text{Number of cases whose sample were found positive for JE}) \div (\text{Number of cases whose samples were tested for JE}) \times 100$

Average temperature data were collected from Accuweather for the year 2019. Cases of JE were recorded from district malaria office.

There are many studies available in literature on JE vector and its mitigation. Various programs are engaged to control the spread out of JE, both in national and international stage. In Assam also, the government has taken all precautionary measures like vaccination, distribution of mosquito nets, insecticides among others to prevent further

spreading up of the disease. According to health department of government of Assam, fogging is going on in full swing across the state periodically. In addition, the department is organizing public awareness campaigns. JE controlling processes often becomes complicated in remote areas in a sense that people are illiterate in these regions and hence have lesser awareness and above and beyond the regions are lesser accessed to government. In such circumstances, alternate wet and dry irrigation (AWDI) is expected to be beneficial to a great extent

Study was conducted in Bihaguri (26.7034° N, 92.7048° E) of Sonitpur district. BB11 variety of rice was used for our study. Plots of 10 square meter area were used for cultivation. Separate plots were used for separate treatment along with their replicates. Altogether 6 plots were prepared including plots for control. Three were used to apply alternate wet and dry irrigation technique and three for control. Except in AWDI plots, water level in other 3 plots were maintained at 5 cm above the soil level throughout the study period. For monitoring water depth in AWDI, 'field water tube' ('pani pipe') was used. A tube of 30 cm length was taken, which was then perforated up to 15 cm. The tube was inserted inside the soil in such a way that the perforated end was under the soil and imperforated end of 15cm was above the soil. From one week before to a week after flowering, the field was kept flooded, topping up to a depth of 5 cm as needed. After flowering, during grain filling and ripening, the water level was allowed to drop again to 15 cm below the soil surface before re-irrigation. Traditional method of cultivation was used



Picture:1 Photograph showing drying of field below 15cm from soil surface, before reirrigation.



Picture: 2 Photographs showing growing stage of rice field after application of AWDI method

Water parameters (DO, Ph and nitrate) studied using multiparameter kit. Organic matter using Walky-Bleacky method and soil moisture content using percent method was studied before and after using the techniques. Available nitrogen, potassium and sodium content of soil was studied using standard procedures.

8. Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject:

Results:

Sonitpur District has seven Block PHCs (Physical Health Center) viz. Gohpur, Behali, Biswanath Chariali, North Jamuguri, Balipara, Bihaguri and Dhekiajuli. Monthly trend of JE in Sonitpur district from 2013 to 2019 shows that Bihaguri sub center record more or less JE cases in each year. However, in 2013 highest JE cases were found in North Jamuguri, Balipara in 2014, Dhekiajuli in 2015 and 2016, North Jamuguri in 2018 and Gohpur in 2019

BPHC	2013	2014	2015	2016	2017	2018	2019
Balipara	1	12	3	2	2	1	7
Gohpur	2	6	4	1	1	1	10
B. Chariali	2	3	2	3	0	2	2
N. Jamuguri	4	4	5	4	2	5	2
Rangapara	0	5	2	0	1	2	1
Dhekiajuli	2	4	6	5	5	2	4
Bihaguri	3	6	5	6	1	4	7
Behali	0	4	3	0	0	1	8

Table 1: JE cases in different BPHC in Sonitpur

Sample positivity rate of JE was found to be highest in the year 2019 and lowest in 2017. However average SPR for these 7 years was 19.61.

YEAR	AES/JE CASES	JE +VE	JE DEATH	SPR%	CFR%
2013	96	14	6	14.58	42.86
2014	231	44	9	19.05	20.45
2015	170	30	7	17.65	23.33
2016	105	21	3	20.00	14.29
2017	124	12	2	9.68	16.67
2018	75	18	7	24.00	38.89
2019	127	41	6	32.28	14.63

Table 2: Sample positivity rate (SPR, in %)

In 2019 the SPR was found to be highest where as it was lowest in 2017. The line diagram for CFR shows it peak in 2018 and lowest in 2016 and 2019.

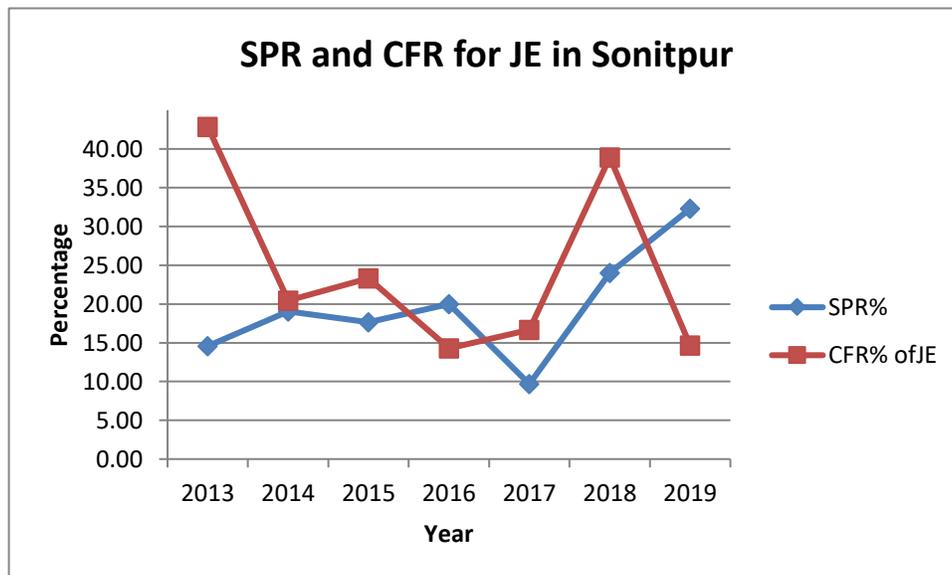


Figure 3: Line diagram of SPR and CFR for JE, from 2013 to 2019 in Sonitpur

Almost an equal sex distribution was observed in case of JE in Sonitpur district. Most of the JE cases belongs to less than 6 years age group were found to be male except in 2016. However most of the JE cases were found to be in higher age group.

age	2013	2014	2015	2016	2017	2018	2019
0-6	4	4	4	2	4	5	8
>6	4	39	21	19	8	11	33

Table 3: Age distribution of AES and JE in Sonitpur

sex	2013	2014	2015	2016	2017	2018	2019
male	5	26	17	8	8	7	25
female	3	17	8	13	4	9	16

Table 4: Sex distribution of AES and JE in Sonitpur

Distribution of AES and JE according to time:-

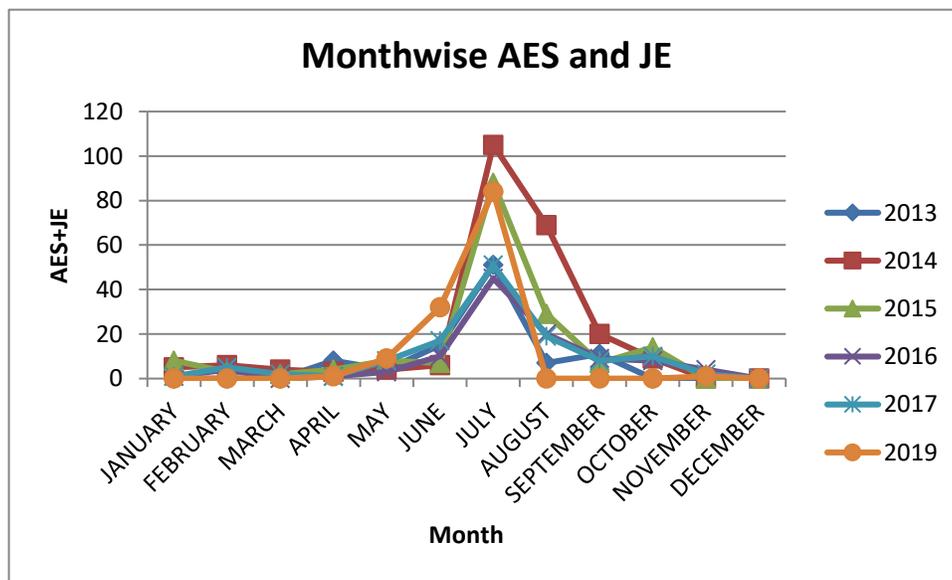


Figure 4: Monthwise distribution of AES in Sonitpur

Line diagram of time distribution of AES cases of Sonitpur District showed distinct big peak in the month of July i.e. at monsoons. AES cases starts in the District from late April and lasts up to October. However, JE cases show their highest peak in the month of July. May to August is the period when JE cases are found in maximum number. In the present study, Epi curve of AES cases of Sonitpur District showed two distinct peaks, one in the month of May and another in July.

YEAR	2013	2014	2015	2016	2017	2018	2019
JANUARY	0	5	8	1	1	1	0
FEBRUARY	0	6	3	4	5	6	0
MARCH	0	4	2	0	2	4	0
APRIL	8	3	4	1	1	3	1
MAY	4	4	8	3	8	4	9
JUNE	15	6	7	10	17	10	32
JULY	51	105	88	45	51	46	84
AUGUST	7	69	29	20	19	1	0
SEPTEMBER	11	20	7	9	8	0	0
OCTOBER	0	9	14	8	10	0	0
NOVEMBER	0	0	0	4	2	0	1
DECEMBER	0	0	0	0	0	0	0

Table 5: Monthwise distribution of AES and JE

The line diagram of present study for Bihaguri showed two distinct peaks, one in the month of May and the other in the month of July. However, the JE shows the highest peak in the month of July. AES cases start distinctly from late April and last up to November, but JE cases start from June, reach their peak value in July. Considering the peak in the Epi curve in July & August for cases in Sonitpur District, it can be stated that vector breeding started from April and June, i.e. around one to one and a half months before the peak. Hence, a temperature favorable for breeding of *Culex* in these regions probably explains the time pattern of JE cases in Sonitpur District.

Months	AES (Acute Encephalitis Syndrome)	JE
January	0	0
February	0	0
March	0	0
April	1	0
May	10	0
June	28	8
July	88	31
August	0	0
September	0	0
October	0	0
November	1	1
December	0	0
Total	128	40

Table 6: Monthwise distribution of AES and JE in Bihaguri, 2019

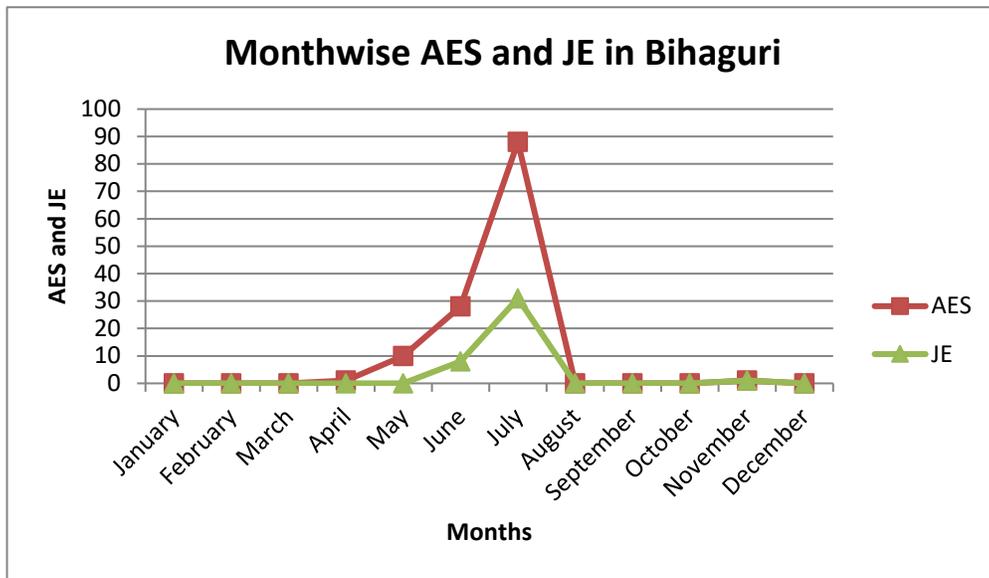


Figure : 6 Line diagram showing time distribution of AES and JE in Bihaguri

Distribution of JE according to place:

There are 44 Public Health Centers in Bihaguri BPHC. In each year most of the cases are seen in the south east part of the block. This may be because these areas mainly have wide spread cultivation area. Constant water logging was observed during monsoons providing a favorable place for mosquito breeding.

PHC	2011	2012	2013	2014	2015	2016	2017	2018	2019
PANCHMILE NSC					1				
DOLABARI	1								
TENGABASTI									
KHALOIBIL									
BHUMURAGURI								1	
BHOJKHOWA	1					1			
GOTLONG					1	1		1	1
PAHUMARA CHUBURI									
BAKARI GAON									
TARAJAN KR GAON									
SOPORA CHUBURI									
PARBATIA									3
KATAKI CHUBURI									
MEKANAR CHUBURI									

KALITA GAON						1			
BARUAH DOLONI									
DHEKIAL GAON						1			
GEREKI									
PUTHIMARI									
NIRALATI									
NIKAMUL									
BARUAH CHAPORI									
BALISHA									
BAHBARI				1					
BAHUMARI								1	
SARAKA			1						
NAHARain									
MONIJARANI									
KHELMATI	1								
BORBIL				1					
NABIL-KOCHARI									
GARUDUBA									2
JAHAMARI									
TELIAGAON									
BORPUKHURI									
PATIAPUKHURI									
NAHARBARI				2					
BALIGAON									
BHER GAON									
BIHAGURI	2				2		1	1	1
TEZPUR	2		2	2		2		2	
BESSERIA STATE DISPENSARY					1				
BANDARMARI STATE DISPENSARY								1	

Table 7 : Distribution of JE in Bihaguri, 2011 to 2019

In 2019 slide positivity rate of JE out of total AES registered was 31.25% in Sonitpur, (Table 4). Occurrence was highest in the month of July. Of the total recorded JE cases of Sonitpur, 17.50% was from Bihaguri.

JE transmission relate to people's socioeconomic status. In Central China, more JE cases were observed among children living in poor quality houses and whose parents had lower income. It is seen in our study that higher numbers of mosquitoes collected per trap is in the trap which was placed inside the hut type of housing. 48.36% of the total mosquito is collected in the trap placed inside the hut, wall of which was made of mud and grass thatched or bamboos, while 39.27% is in the trap inside the concrete house which are four sided houses with tin roof with walls made of bricks and concrete blocks and at least 12.27% specimens is in the trap hung in the cattle shed. The high density of *Culex* mosquito in Hut type of housing shows the degree of predisposition to mosquito bites for individuals living in these dwellings and therefore the substantial risk of Encephalitis infection. It can be said that JE infections are interplay of multiple factors such as the presence and proximity to mosquito breeding sites and variations in the physical characteristics of the housing type. In that case it is remarkable that besides having easy host to feed upon, like cows in the cattle shed; more number of specimens are found in human dwelling areas.

Month	Hut	Concrete housing	Cattle shed
Jan	52.67±10.81	37.32±4.58	10.01±6.66
Feb	67.17±8.04	42.98±12.25	4.67±3.73
Mar	53.2±2.66	35.47±3.46	11.33±5.02
Apr	40.24±3.16	39.19±3.14	20.57±2.11
May	48.92±5.38	32.93±6.05	18.15±3.89
Jun	38.96±2.13	35.47±3.6	25.72±3.16
Jul	43.12±5.98	40.67±5.21	12.82±1.29
Aug	36.28±4.18	60.64±6.36	3.08±2.31
Sept	59.09±7.33	21.95±11.97	13.97±6.45
Oct	32.22±11.36	23.2±8.98	11.25±7.56
Nov	42.32±9.19	51.62±10.07	6.06±1.02
Dec	26.79±8.62	47.23±10.25	6.43±3.58

Table 8 : *Cx* species collected in different traps (in %)

Monthwise distribution of JE vector (*Culex*):

The population of *Culex vishnui* becomes most abundant in the month of May to July. Then the population gradually decline to December and then again the population begins to rise. The abundance of *Culex pseudovishnui* is maximum in the month June and then it gradually decreases. However the population of *Culex tritaenorrhynchus* is abundant throughout the year with maximum in the month of November. *Culex vishnui* is found in highest number in the study area.

Months	<i>Cx. tritaenorrhynchus</i>	<i>Cx. pseudovishnui</i>	<i>Cx. vishnui</i>
Jnauary	44.07±4.64	43.15±1.58	12.78±3.09

February	23.87±7.71	26.12±.66	50.01±7.82
March	15.28±2.73	16.50±3.27	70.72±2.30
April	18.8±3.94	23.81±.89	61.49±7.34
May	12.84±3.51	10.45±3.20	77.50±7.04
June	6.09±1.29	8.20±4.87	83.19±7.38
July	7.68±1.63	5.61±1.85	85.66±1.92
August	19.4±5.34	12.23±2.62	68.64±6.27
September	24.9±1.29	44.95±12.45	30.10±13.22
October	75.8±8.53	22.53±8.09	1.67±1.67
November	66.14±8.02	32.89±7.14	8.85±2.24
December	76.15±5.63	19.61±8.28	4.25±2.67

Table 9: Monthwise distribution of *Culex* in Bihaguri

In relation to temperature it is found that population of *Culex vishnui* gradually increases with increase in temperature and the peak value was seen in the month of June. It then gradually decreases towards end of the season. In case of *Culex tritaenorynchus* two peaks of its maximum is seen in two different months, one is in April and the other one is in June. Similarly the population peak for *Culex pseudovishnui* is seen in the month of November.

Change in population of *Culex* with change in temperature and rainfall:

Months	<i>Culex. tritaenorhynchus</i>	<i>Culex. pseudovishnui</i>	<i>Culex. vishnui</i>	Temperature	rainfall
January	44.07±4.64	43.15±1.58	12.78±3.09	17.24±1.12	0.1±.06
February	23.87±7.71	26.12±.66	50.01±7.82	19.27±1.23	1.1±.7
March	15.28±2.73	16.50±3.27	70.72±2.30	23.76±1.41	2± 1.63
April	18.8±3.94	23.81±.89	61.49±7.34	25.87±1.04	7.3± 1.98
May	12.84±3.51	10.45±3.20	77.50±7.04	26.74±.85	15.1± 3.24
June	6.09±1.29	8.20±4.87	83.19±7.38	30.03±3.20	9.8± 3.16
July	7.68±1.63	5.61±1.85	85.66±1.92	29.5±.74	12.3± 3.04
August	19.4±5.34	12.23±2.62	68.64±6.27	31.29±.89	5.2± 2.12
September	24.9±1.29	44.95±12.45	30.10±13.22	28.95±.85	7.1± 2.6
October	75.8±8.53	22.53±8.09	1.67±1.67	26.87±.95	3.6± 1.89
November	66.14±8.02	32.89±7.14	8.85±2.24	24.28±1.10	0.4± .25
December	76.15±5.63	19.61±8.28	4.25±2.67	18.95±1.2	0.2± .18

Table 10 : Numbers of mosquito with change in temperature

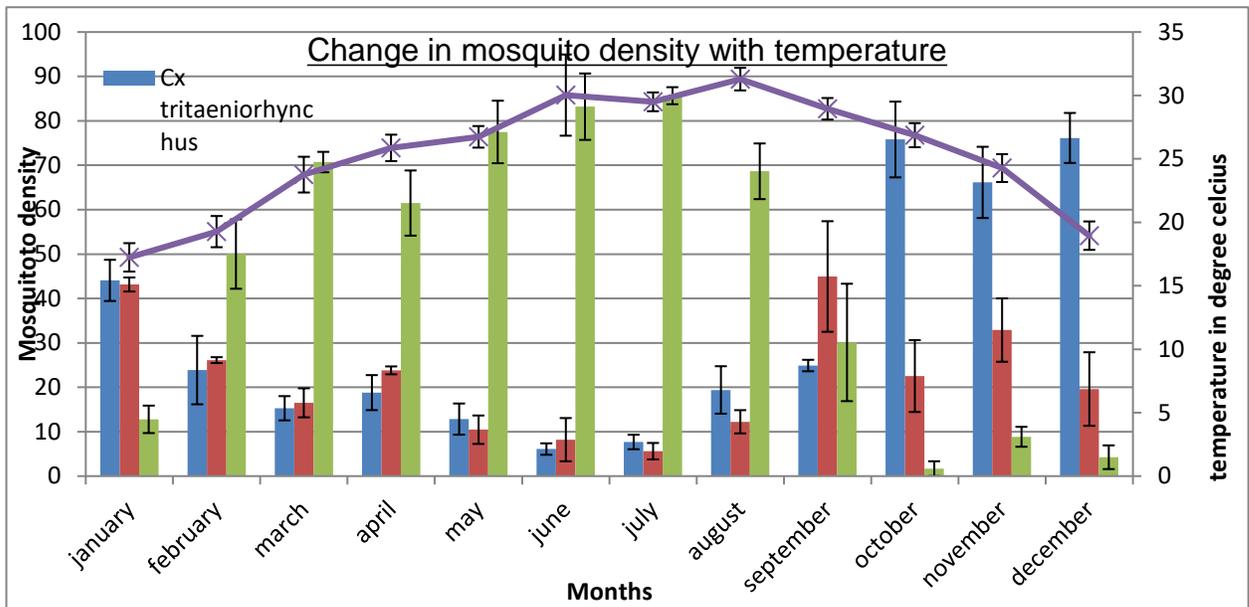


Figure 7: Monthwise distribution of JE vector with reference to change in temperature

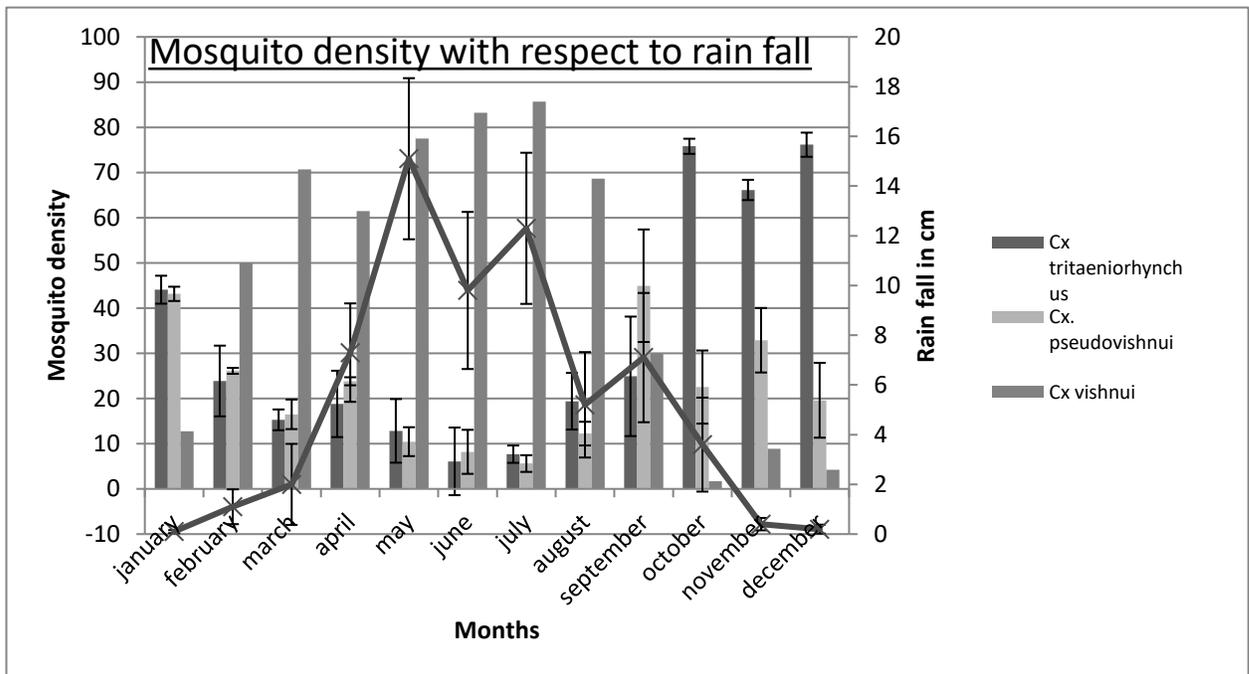


Fig:8 Density of JE vector with change in rainfall

It is seen that the density of *Cx. tritaeniorhynchus*, increases with increase in rainfall but density of *Cx. pseudovishnui* and *Cx. vishnui* decreases with increase in rainfall and density of *Cx. vishnui* reaches its peak when rainfall is minimum.

Physiochemical parameters of water and soil:

Water samples collected within the 5 km buffer area of the study site. In our study we have considered paddy cultivated fields for water sampling. This is because rice cultivated fields are favorable breeding site of Culex mosquito species. The physicochemical parameter of the water sample shows conductivity 432.4 ± 140.3 , salinity 0.40 ± 0.12 , TDS 309.5 ± 90 , DO $95.13 \pm 0.03\%$, NO_3^- 0.66 ± 0.00 $\text{NO}_3^- \text{-N}$, pH 6.4 ± 0.05 and turbidity 51.0 ± 12.6 NTU.

Parameters of water	Reading
pH	6.4 ± 0.05
NO_3^-	0.66 ± 0.00 $\text{NO}_3^- \text{-N}$
DO	$95.13 \pm 0.03\%$
TDS	309.5 ± 90.1 mg/l
Salinity	0.40 ± 0.12 ppt
Conductivity	432.4 ± 140.3 $\mu\text{S/cm}$
Turbidity	51.0 ± 12.6 NTU

Table: 11 Parameters of water (preliminary)

In Sonitpur, presently only 24% of cultivable area is irrigated and the main source of irrigation is shallow tube wells (STW) and low lift pump (LLP) that contributes 11% to total irrigated area. Farmers in the study area i.e., Naapam village are been deprived of STW irrigation facility that is STW due to non clearance on Arsenic content of ground water by the concerned authority. Therefore, the proposed AWDI technique will be very helpful to farmers of Naapam village in achieving more rice yield using limited amount of water. The proposed project will also facilitate weekly monitoring of soil and water quality that will help in improving and upgrading the present agricultural practices (other crops) along with implementation of AWDI technique.

A ground study has been conducted in Napaam village under Bihoguri subcenter of Sonitpur district, and AWDI method was tested in lowland rice plots in selected areas for a period of 1 year. Preliminary results (fig: 8) showed improved field conditions with optimization of soil variable like pH, soil nitrate content and soil organic matter. Implementation of AWDI method also helped in increasing dissolved oxygen (DO) of water supplied in the fields after a study period 12 months. Figure: 8 represent a glimpse of some positive results of AWDI method, performed in Naapam village near Tezpur University:

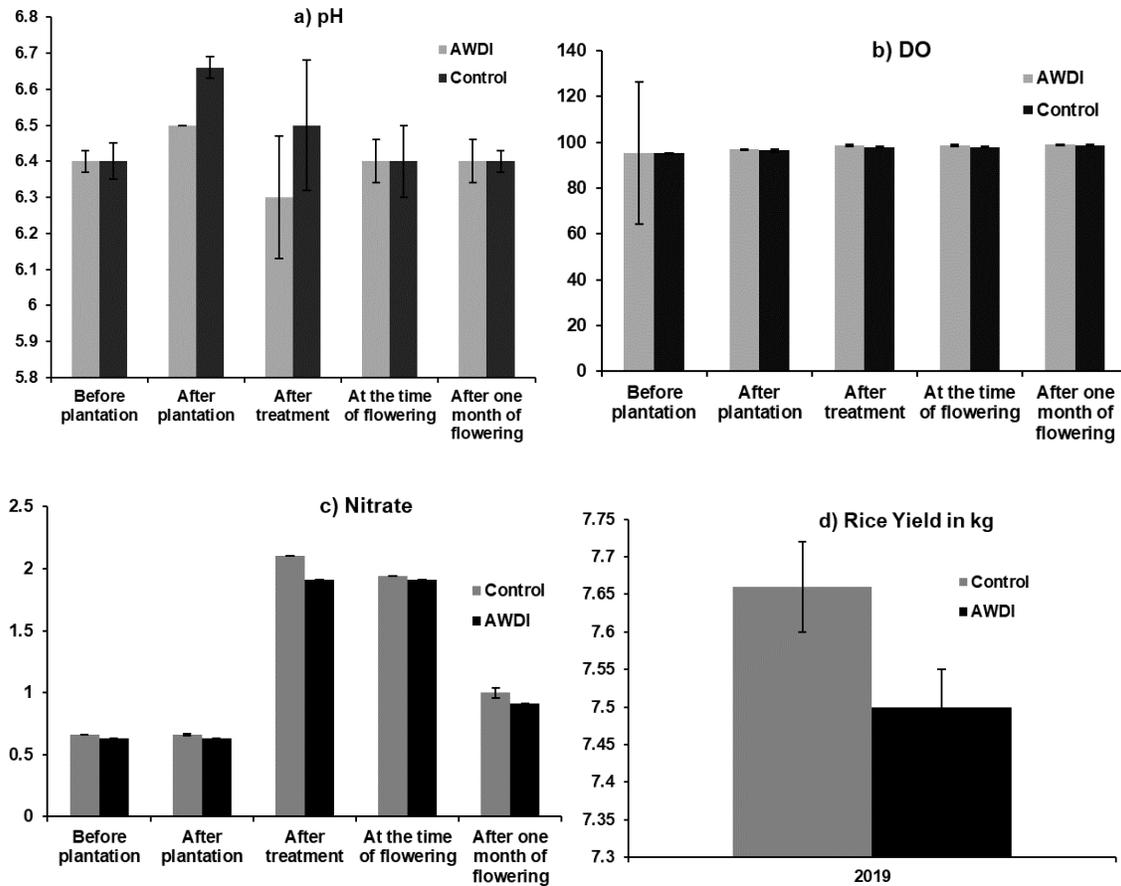


Figure 8: pH,DO,Nitrate, Rice Yield (kg) in experimental plots after implementation of AWDI

However the yield was found to be slightly lower than the yield in traditional method, the soil and water environment required for the growth of rice was found to be same in both the practices. The organic matter(fig: 9) content of the soil was found to be higher in AWDI method in comparison to traditional method. Available nitrogen(fig: 10) content of the soil in AWDI was found slightly lower but Potassium(fig: 11) content was found to be higher in comparison to traditional method. The study shows that AWDI practices does not have any harmful effect to the soil and water environment which hamper the paddy cultivation, rather it help in larval development of mosquito.

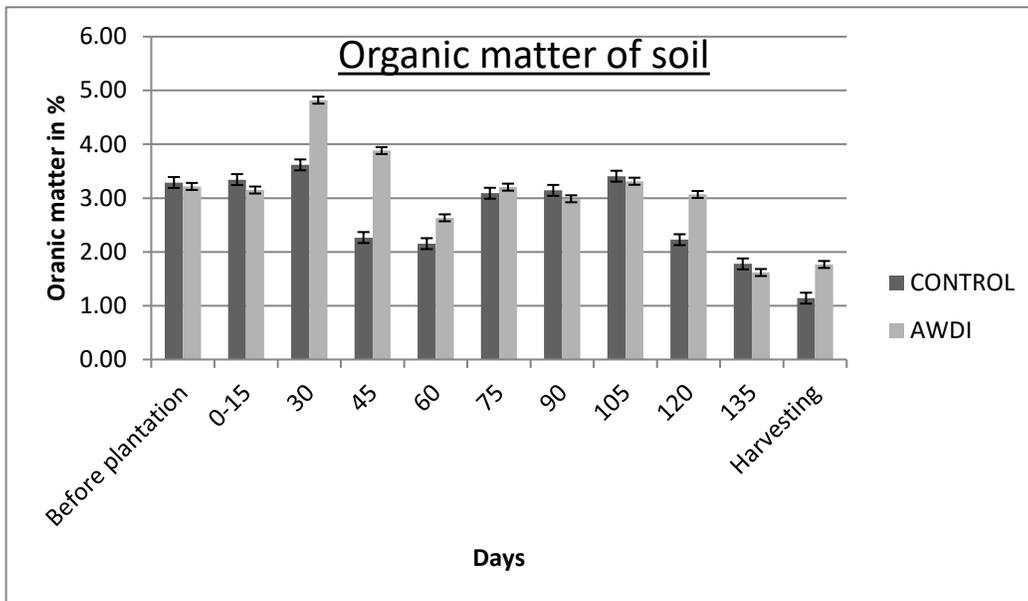


Figure : 9 Organic matter content of soil (in %)

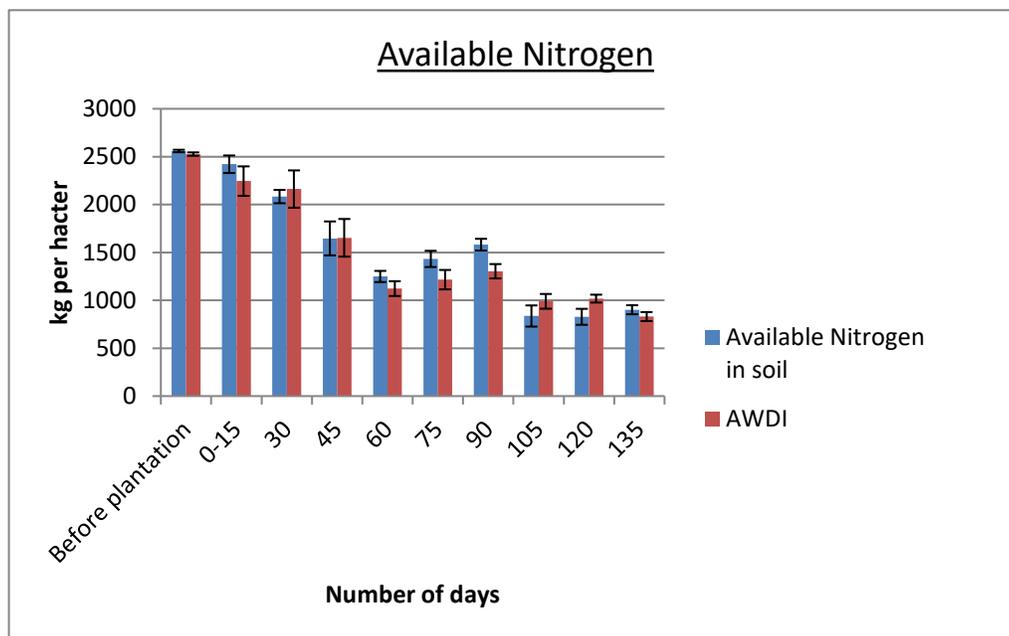


Figure 10: Available Nitrogen content of soil (in kg ha⁻¹)

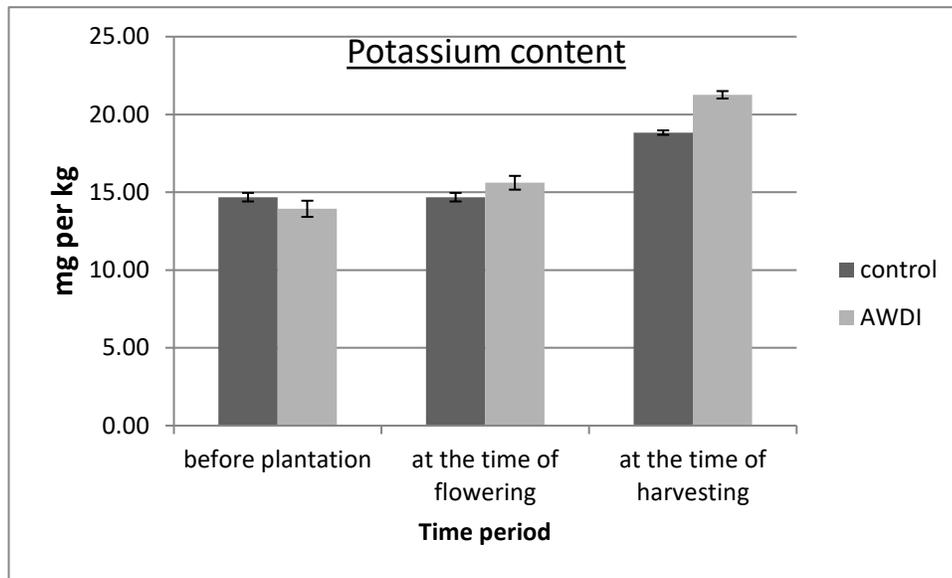


Figure 11: Potassium content of soil (in mg kg⁻¹)

9. Conclusions summarizing the achievements and indication of scope for future work:

In the above study it is seen that

1. JE is a predominant infection among children as well as among adult.
 2. Highest peak has been observed in the month of July and May to August which is the period of maximum JE cases and this is the monsoon season in the district.
 3. JE cases have been found in the south-west region of Bihaguri BPHC, consistently in all the years. This may result in the endemicity of JE in these areas in near future.
 4. AWDI could be a possible solution the control JE vector in its breeding site as it does not hamper the soil and water environment in lowland paddy cultivation. But more study is required in this regard.
 5. In the study yield was found to be slightly lower than traditional practice, 7.65kg in traditional method and 7.5kg in AWDI method. However extensive study is required in this regard.
 6. Culex vishnui is found to be predominant in the study site.
10. New Observations: In many studies it is mentioned that JE is mainly rural areas which are very near to agricultural land. But in our study we have seen that JE cases are equally distributed in urban areas also. It may be due to water logging condition in urban areas because of unplanned drainage.

11. Innovations:

Alternate Wet And Dry irrigation does not hamper the soil and water environment for paddy cultivation, rather it has water saving potentials. It should be practiced by farmers of North-east India in cultivation of paddy.

12. Application Potential:

- a. Immediate: AWDI method does not have any immediate effect.
- b. Long Term: In the long run it can reduce the water requirement for irrigated lowland rice cultivation. Although we started to study the vector control potential, it could not be completed because of the pandemic situation. The larvae were collected for identification; but because of closer of laboratory all the samples got destroyed.

13. S&T benefits accrued:

- a. List of Research publications: One paper under review

S No	Authors	Title of paper	Name of the Journal	Volume	Pages	Year

- b. Manpower trained on the project
 - i) Ph.D. produced
 - ii) Other Technical Personnel trained
- c. Patents taken, if any

14. Financial Position:

S No	Financial Position/ Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1.	Salaries/ Manpower costs	10,80,000	3,60,000	33.33
2.	Equipment	4,00,000	3,90,830	97.71
3.	Supplies & Materials	1,50,000	56,030	37.35
4.	Contingencies	60,000	20,818	34.7
5.	Travel	60,000	31,653	52.75
6.	Overhead Expenses	55,000	35,669	64.86
7.	Others, if any			
	Total	18,05,000	8,95,000	100%

15. Procurement/ Usage of Equipment

a)

S No	Name of Equipment	Make/ Model	Cost (FE/ Rs)	Date of Installation	Utilisation Rate (%)	Remarks regarding maintenance/ breakdown
1	Handaled Multiparameter System	HANDALED MULTIPARAMETER SYSTEM STARA3295	2,40,000	30/05/2018		Validity of electrodes and DO module expired
2	CDC miniature light trap	CDC MINIATURE LIGHT TRAP MODEL# 512	90,771	12/10/2018		Working in a good condition
3	6 volt rechargeable battery	-----	1050	17/07/2018		Damaged due to over use
4	Computer	DELL/Latitude 3480(Intel core i5-7200u2.5 Ghz)	49042.35	09/08/2018		Working in a good condition
5	Printer	HP/MFP M132nw	11017	07/01/2019		Not working

b) Plans for utilising the equipment facilities in future:

The procured instruments will be utilized further for research purpose only. It will be utilized for pursuing my Ph.d.

Name and Signature with Date

a. Oli Talukdar 5/8/21
(Principal Investigator)

b. Sahaburay 30/8/21
(Mentor)

Assistant Professor
Dept. of Environmental Science
Tezpur University

GFR 12 - A
[(See Rule 238 (1))]FORM OF UTILIZATION CERTIFICATE
FOR AUTONOMOUS BODIES OF THE GRANTEE ORGANIZATIONUTILIZATION CERTIFICATE FOR THE YEAR 2020 - End in respect
of recurring/non-recurring
GRANTS-IN-AID/SALARIES/CREATION OF CAPITAL ASSETS

- Name of the Scheme Women Scientist Scheme - B (WOS-B)
- WOS-A Reference No. SR/WOS-12/843/2016(A)
- Principal Investigator Mrs. Ali Salukdas
- Whether recurring or non-recurring grants Recurring
- Grants position at the beginning of the Financial year
 - Cash in Hand/Bank 28,670
 - Unadjusted advances
 - Total 28,670
- Details of grants received, expenditure incurred and closing balances: (Actuals)

Unspent Balances of Grants received years [figure as at Sl. No. 3 (iii)]	Interest Earned thereon	Interest deposited back to the Government	Grant received during the year			Total Available funds (1+2-3+4)	Expenditure incurred	Closing Balances (5-6)
			Sanction No. (i)	Date (ii)	Amount (iii)			
1	2	3	4			5	6	7
28670	186	186 (16082.100 05265)	SR/WOS- 12/843/ 2016(A)	11/10/ 2017	Nil	28,670	37,840	-9170

Component wise utilization of grants:

Grant-in-aid-General	Grant-in-aid-Salary	Grant-in-aid-creation of capital assets	Total
37840	Nil	NA	37,840

Details of grants position at the end of the year

- Cash in Hand/Bank - 9170
- Unadjusted Advances
- Total - 9170

Signature of PI Ali SalukdasDate 26/04/22

Signature

Name..... Chief Finance Officer
(Head of the Finance)/ (With seal)Date Finance OfficerTejpur University
165

Signature

Name..... Head of the Organisation
(With seal)Date RegistrarTejpur University



Certified that I have satisfied myself that the conditions on which grants were sanctioned have been duly fulfilled/are being fulfilled and that I have exercised following checks to see that the money has been actually utilized for the purpose for which it was sanctioned:

- (i) The main accounts and other subsidiary accounts and registers (including assets registers) are maintained as prescribed in the relevant Act/Rules/Standing instructions (mention the Act/Rules) and have been duly audited by designated auditors. The figures depicted above tally with the audited figures mentioned in financial statements/accounts.
- (ii) There exist internal controls for safeguarding public funds/assets, watching outcomes and achievements of physical targets against the financial inputs, ensuring quality in asset creation etc. & the periodic evaluation of internal controls is exercised to ensure their effectiveness.
- (iii) To the best of our knowledge and belief, no transactions have been entered that are in violation of relevant Act/Rules/standing instructions and scheme guidelines.
- (iv) The responsibilities among the key functionaries for execution of the scheme have been assigned in clear terms and are not general in nature.
- (v) The benefits were extended to the intended beneficiaries and only such areas/districts were covered where the scheme was intended to operate.
- (vi) The expenditure on various components of the scheme was in the proportions authorized as per the scheme guidelines and terms and conditions of the grants-in-aid.
- (vii) It has been ensured that the physical and financial performance under..... (name of the scheme has been according to the requirements, as prescribed in the guidelines issued by Govt. of India and the performance/targets achieved statement for the year to which the utilization of the fund resulted in outcomes given at Annexure - I duly enclosed.
- (viii) The utilization of the fund resulted in outcomes given at Annexure - II duly enclosed (to be formulated by the Ministry/Department concerned as per their requirements/specifications.)
- (ix) Details of various schemes executed by the agency through grants-in-aid received from the same Ministry or from other Ministries is enclosed at Annexure -II (to be formulated by the Ministry/Department concerned as per their requirements/specifications).

Date: 26/04/22

Place Tezpur

Oli Talukder
Signature of PI

Date 26/04/22

Signature

Name..... Chief Finance Officer
(Head of the Finance)/ (With seal)

Date **Finance Officer**
Tezpur University

Signature

Name..... Head of the Organisation
(With seal)

Date **Registrar**
Tezpur University

(Strike out inapplicable terms)

GFR 12 - A
[(See Rule 238 (1))]FORM OF UTILIZATION CERTIFICATE
FOR AUTONOMOUS BODIES OF THE GRANTEE ORGANIZATIONUTILIZATION CERTIFICATE FOR THE YEAR 2020 - End in respect
of recurring/non-recurring
GRANTS IN-AID/SALARIES/CREATION OF CAPITAL ASSETS

- Name of the Scheme Women Scientist Scheme - B/WOS-B
- WOS-A Reference No. SR/WOS-B/843/2016(a)
- Principal Investigator Mr. Ali Salukdar
- Whether recurring or non-recurring grants Non-Recurring
- Grants position at the beginning of the Financial year
 - Cash in Hand/Bank 9170
 - Unadjusted advances
 - Total 9170
- Details of grants received, expenditure incurred and closing balances: (Actuals)

Unspent Balances of Grants received years [figure as at Sl. No. 3 (iii)]	Interest Earned thereon	Interest deposited back to the Government	Grant received during the year			Total Available funds (1+2-3+4)	Expenditure incurred	Closing Balances (5-6)
			Sanction No. (i)	Date (ii)	Amount (iii)			
1	2	3	4			5	6	7
9170	760	760 (16082100 85965)	SR/WOS-B/843/2016(a)	11/10/2017	Nil	9170	Nil	9170

Component wise utilization of grants:

Grant-in-aid-General	Grant-in-aid-Salary	Grant-in-aid-creation of capital assets	Total
NA	NA	Nil	Nil.

Details of grants position at the end of the year

- Cash in Hand/Bank 9170
- Unadjusted Advances
- Total 9170

Signature of PI
Ali Salukdar

Date

26/04/22

Signature

Name..... [Signature]
Chief Finance Officer
(Head of the Finance)/ (With seal)

Date

Finance OfficerJespur University

165

Signature

Name..... [Signature]
Head of the Organisation
(With seal)

Date

Registrar
Jespur University



Certified that I have satisfied myself that the conditions on which grants were sanctioned have been duly fulfilled/are being fulfilled and that I have exercised following checks to see that the money has been actually utilized for the purpose for which it was sanctioned:

- (i) The main accounts and other subsidiary accounts and registers (including assets registers) are maintained as prescribed in the relevant Act/Rules/Standing instructions (mention the Act/Rules) and have been duly audited by designated auditors. The figures depicted above tally with the audited figures mentioned in financial statements/accounts.
- (ii) There exist internal controls for safeguarding public funds/assets, watching outcomes and achievements of physical targets against the financial inputs, ensuring quality in asset creation etc. & the periodic evaluation of internal controls is exercised to ensure their effectiveness.
- (iii) To the best of our knowledge and belief, no transactions have been entered that are in violation of relevant Act/Rules/standing instructions and scheme guidelines.
- (iv) The responsibilities among the key functionaries for execution of the scheme have been assigned in clear terms and are not general in nature.
- (v) The benefits were extended to the intended beneficiaries and only such areas/districts were covered where the scheme was intended to operate.
- (vi) The expenditure on various components of the scheme was in the proportions authorized as per the scheme guidelines and terms and conditions of the grants-in-aid.
- (vii) It has been ensured that the physical and financial performance under..... (name of the scheme has been according to the requirements, as prescribed in the guidelines issued by Govt. of India and the performance/targets achieved statement for the year to which the utilization of the fund resulted in outcomes given at Annexure – I duly enclosed.
- (viii) The utilization of the fund resulted in outcomes given at Annexure – II duly enclosed (to be formulated by the Ministry/Department concerned as per their requirements/specifications.)
- (ix) Details of various schemes executed by the agency through grants-in-aid received from the same Ministry or from other Ministries is enclosed at Annexure – II (to be formulated by the Ministry/Department concerned as per their requirements/specifications).

Date: 26/04/22

Place: Jaipur

Ali Talekedar
Signature of PI

Date: 26/04/22

[Signature]
Signature

Name..... Chief Finance Officer
(Head of the Finance)/ (With seal)

Date: Finance Officer
Jaipur University

[Signature]
Signature

Name..... Head of the Organisation
(With seal)

Date: Registrar
Jaipur University

(Strike out inapplicable terms)

STATEMENT OF EXPENDITURE

1. Sanction Order No and Date: SR/WOS-B/843/2016(G) Dated: 11/10/2017
2. Total Project Cost: 18,05,000
3. Revised Project Cost (if applicable):
4. Date of Commencement: 11/10/2017
5. Grant received in each year:
 - a. 1st Year: 8,95,000
 - b. 2nd Year: Nil
 - c. 3rd Year: Nil
 - d. Interest, if any: $7205+1135+946= 9286$
 - e. **Total (a+b+c+d): $8,95,000+9286= 9,04,286$**

STATEMENT OF EXPENDITURE

To be submitted financial year wise
(01/04/2019 to 10/10/2020)

S No	Sanctioned Heads	Sanctioned Cost	Expenditure Incurred			Total Expenditure IV + V + VI	Balance as on 11/10/2020 III - VII =	Requirement of Funds upto 31 st March next year	Remarks (if any)
			1 st Year (11/10/2017 to 31 st March 2018) (IV)	2 nd Year (1 st April, 2018 to 31 st March 2019) (V)	3 rd Year & (1 st April 2019 to 10/10/2020) (VI)				
1.	Fellowship	10,80,000	1,50,000	2,10,000	Nil	3,60,000	7,20,000	3,60,000	
2.	Consumables	1,50,000	54,980	1,050	Nil	56,030	93,970	50,000	
3.	Travel	60,000	nil	14,720	16,933	31,653	28,347	20,000	
4.	Contingencies	60,000	20,818	nil	Nil	20,818	39,182	20,000	
5.	Others, if any								
6.	Equipment	4,00,000	nil	3,90,830	Nil	3,90,830	9,170		
7.	Overhead expenses	55,000		14,762	20,907	35,669	19,331	5,000	
8.	Total	18,05,000	2,25,798	6,31,362	37,840	8,95,000	9,10,000	4,55,000	

Oli Talukdar
Oli Talukdar

Name and Signature of Principal Investigator:
Date: 26/04/2022

Signature of Competent financial authority
(with seal) *[Signature]*
Finance Officer
TERRA UNIVERSITY

* DOS - Date of Start of Project

- Note :
- Expenditure under the sanctioned heads, at any point of time, should not exceed funds allocated under that head, without prior approval of DST i.e. Figures in Column (VIII) should not exceed corresponding figures in Column (III)