PROGRESS REPORT OF THE SUB-PROJECT DURING 2007-08

Particulars of the Sub-project

Sl. No.	Items	Information
i	Title	**Arsenic in Food-Chain: Cause, Effect and Mitigation**
ii	Code No	NAIP/C-4/1005/2006-07 dated 12.06.2007
iii	Component	Four
iv	Lead Consortium	Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia
v	Name of the CPI	Prof. Supradip Sarkar
vi	Consortium Partners	• Uttar Banga Krishi Viswavidyalaya, Pundibari, Cooch Behar. • West Bengal University of Animal & Fishery Sciences, Kolkata. • Indian Veterinary Research Institute (ERS), Kolkata. • Central Inland Fisheries Research Institute, Barrackpore. • D.N. Guha Majumdar Research Foundation, Kolkata.
vii	Date of Start of the Sub-project	September, 2007
viii	Date of Completion of the Sub-project	31.03.2012
ix	Period covered in the Report	01.09.2007-31.03.2008
x	Meeting among Consortium partners	Eight
xi	CIC meeting	Held on 14.01.08
xii	CAC meeting	Held on 01.02.08
xiii	Launch workshop	Held on 01.02.08
xiv	Formation of CMU	Formed and approved by CAC
xv	Attend NAIP workshop	• The CPI and a CoPI attended the M & E workshop, held at NAARM, Hyderabad on 9th and 10th August, 2007. • The CPI, Finance Officer of the Lead Center, all CCPIs and Co PIs attended the Procurement plus M & E workshop, held at NAARM, Hyderabad from 4th to 6th January, 2008. • Finance Officers of the Lead Center and one Cooperating Center (DNGMRF) attended the workshop on Financial Regulations of NAIP at IARI campus on18th January, 2008.
xvi	Visit of the National Coordinator (NC)	• Dr. A. Bandyopadhyay (NC, Component 4) held a formal meeting with all the Partners of the Consortium to discuss about the MOU, Contract Forms and also highlighted budgetary/ manpower requirements for the sub-project. The meeting was held at WBUAFS, Belgachia on 26th April, 2007. • The National Coordinator along with the scientists and RAs/SRFs, of all the partners visited different villages of the study site on 02.02.08 and interacted with the farmers/ people affected by arsenic pollution.

Research Objectives

- To study genetics of arsenic tolerance, physiology and transport mechanism in rice.
- To identify microbes which could be used for soil amelioration.
- To characterize the path of arsenic in food-chain along with mitigation options.
- To determine the adverse effect of arsenic on human health through food-chain.
- To organize workshop and training programmes.

Physical and Financial Progress

a) Physical

Sl. No.	Plan of work	Progress made
i.	Recruitment of research personnel	Research Associates, Senior Research Fellows and other Contractual staff for all the Centers have joined and doing work.
ii.	Literature survey	Collection and compilation of literature, related to the project work, is progressing satisfactorily.
iii.	Selection of study sites	In Nadia district, the villages, namely Ghentugachi, Gontera, Madalhat and Dakshin Panchpota of Chakdaha Block; Dasdia, Nonaghata and Mitrapur of Haringahata Block have been identified under Cohort I and II. Villages under Akna Gram Panchayet of Polba Block in Hoogly district have been selected under Cohort III.
v	Development of protocols for base-line survey	Protocols have been developed and used by the Partners during the survey
v.	Base-line survey	In Ghetuganchi and Gontera villages, arsenic status of the representative tube wells and pond water as well as of soil has been analyzed. Food samples have been collected. Health status of arsenic polluted ruminants and human has also been assessed. Base-line study of arsenic exposure and prevalence of arsenicosis cases of all the villages under study have already been conducted by DNGM Research Foundation.
vi.	Fine mapping of rice gene responsible for low or minimal uptake ability of arsenic	1. F1 – seed of crossing between a high arsenic uptake rice genotype, "Palman", and a low arsenic uptake genotype, 'Kalman', has been developed. 2. 75 SSR primers distributing 12 chromosomes of rice have been selected and given order. 20 gene specific primers have also been designed from arsenate reductase, phytochelatin synthase etc.
vii.	Suitable irrigation management to reduce arsenic status in biomass	Experiments in farmers field at Gontera are progressing satisfactorily.

Sl. No.	Plan of work	Progress made
	and grain of rice and maize	
viii.	Use of organic amendments to mitigate arsenic intake in rice-based cropping system (s)	Experiments in farmers field at Gontera are progressing satisfactorily.
ix.	Standardization of culture media and isolation of arsenic tolerant microbes from soil and aquatic environments.	Isolation of arsenic resistant bacteria has been performed from water/soil samples by using Basal salt medium with citrate/ acetate as carbon sources and As^{+3}/ As^{+5} as electron donor/acceptor (done by CIFRI only).
x.	Incubation and pot studies with different organic manures to study the chemistry of organo arsenic complexation	Not yet started, because purchase of equipment and development of laboratory is under process.
xi.	Quantification of arsenic status in feeds, water consumed by ruminats /birds, milk, egg, meat, fish, etc.	The method for determination of arsenic has been standardized by HG-AAS. About 20 samples including water and fish collected from arsenic affected water bodies and market have been analyzed.
xii.	Standardization of proteomic analysis methods in fish muscle tissue	Protein estimation by Lowry's method and their detailed analysis by different electrophoretic methods like SDS PAGE, Western Blot have been standardized. Molluscan specimen (10 each) of *Lamellidens marginalis, Pila globosa, Bellamya bengalensis* have been analyzed from arsenic affected/unaffected zones.
xiii.	Assessment of health status of cohort population and correlation with arsenic exposure through water and food	Final Selection of Participants and pilot study of all the three cohorts completed : Following activities performed. a) Clinical examination of 60 participants completed. b) For arsenic exposure assessment through food, 24 hours diet history was taken from all the participants and 141 diet samples were collected. c) Fifty seven water samples used by the participants were collected. d) Two hundred and eighty two patients have been examined and treated (including supply of free medicines) during the field visits.
xiv.	Arsenic status of bio-markers (urine and hair) collected from cohort population and ruminants.	a) Fifty nine hair samples and 111 urine samples were collected from the participants. b) All collected samples were sent to the School of Tropical Medicine, Kolkata for laboratory analysis.

b) Financial (Rs. in lakhs)

Head	Funds Budgeted	Fund Received from PIU	Funds utilized (approx.)*
TA	5.000	2.500	1.95181
Workshop/Meeting	1.500	0.750	0.54734
Contractual Services	24.722	12.361	10.24024
Operational Cost	37.000	18.500	18.50343
Training	1.000	0.500	0.000
Consultancy	0.000	0.000	0.000
Equipment**	277.579	277.579	272.0732
Furniture***	6.650	6.650	6.64437
Works (new/renovation)	4.000	4.000	2.95609
Others (Animal/ Journals/ Books) Publication	3.000	3.000	2.80576
Institutional charges	5.106	2.553	2.65
Total	**365.557**	**328.393**	**318.3722**

***** UBKV spent Rs. 0.34,1.0 and 0.19 lakh on TA, operational cost and Institutional charges, respectively. However, under these heads, UBKV received Rs. 0.25, 0.5 and 0.093 lakh. WBUAFS spent Rs. 25.83729 lakh on equipment head; however, the sanction was for Rs. 25 lakh. CIFRI spent Rs. 3.17748 lakh on operational cost head, however, it received Rs. 2.0 lakh on that head. The CCPI of CIFRI only made a prior intimation to the CPI and the National Coordinator (NC) regarding the additional expenditure. He also made an appeal to the NC (Component-4) for the release of the remaining 50% of the budgeted funds on operational head. As he submitted the SOE during the last week of March, 2008, the NC was not able to arrange to release any fund to this Center.

Signature of CPI