

4. RESULT & DISCUSSIONS

The experiment was conducted as in Figure 1 in which the bamboo bandals are placed in series in the right bank of the river channel in the alignment of the downstream direction of the channel. There was a very beautiful sedimentation on and behind the bamboo bandals over the channel near the bank which is due to the low velocity near the bank as in Figure 2. It is appeared from the Figure 3a. and Figure 3b. so that the bed level between the bamboo bandals is higher whereas the bed level beyond the bamboo bandals are lower. It is seen from the Figure 4a. and Figure 4b. so that the magnitude of the velocity vector is low near the bank whereas the the magnitude of the velocity vector is higher in the middle of the channel. This is may be the cause of the siltation of the river channel near the bank. So it is clear that from the Figure 4 that the velocity near the river bank is low than that of higher toward the main channel. It can further be confirmed that in the river cross-sectional plot as in Figure 5a and Figure 5b. so that there is sedimentation near the river channel. It is concluded from the result and discussions so that there is a siltation near the river bank where as there is deep pool away from the river bank. So it can be decided that the bamboo bandalling structures are working as a river bank erosion protection structures.

5. CONCLUSION

It is concluded that bamboo bandals are capable for protecting river banks erosion by flow diversion towards the main channel leading to deep navigational channel formation in the main river. On the other hand, flow velocities are reduced near the bank lines that ensure bank protection by the deposition of sediment. If the bandal structure functions optimistically, the river can get sufficient time for its adjustment and new main channel and bank line development.

References

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Biographies

Dr. Engr. Md. Lutfur Rahman is a Director and X-Director General of River Research Institute, Faridpur, Bangladesh. He has completed his Ph.D. in the field of Civil Engineering major in water Resources Engineering in 2014 from Dhaka University of Engineering and Technology (DUET) Bangladesh. Dr. Rahman is doing his research from 2005 to till date to complete his research on the sediment management by using Bamboo Bandalling Structures. He has taken initiative to prepare a design manual for the interest of the common people in Bangladesh. He is the member (M-57095), International Association for Hydro-environment Engineering and Research (IAHR), World-wide Hydraulic & Environmental Research Institute, life member (LM#793), The Indian Society of Hydraulics (ISH), India, life fellow (LF # 4220), Institute of Engineers, Bangladesh (IEB); member (M# 570), Bangladesh Association for the Advancement of Science (BAAS); member (M # 620), Bangladesh Computer Society (BCS). life member, National Oceanographic and Maritime Institute (NOAMI) and life member (M#19868701812L), Association of BUET Alumni (ABUETA), Bangladesh. He has received letter of appreciation as Chief Scientific Officer (CSO) from the Secretary, Bridge Division, and Ministry of Communication for his excellent engineering work in the field of river bank erosion protection. He is also a recipient of the best sub-centre award as an Engineer from Sheikh Hasina, Honorable Prime Minister, and Govt. of the People's Republic of Bangladesh for the recognition of the excellence performance in the professional activities in the 14th January 2012 at the 53rd IEB convention.

Prof. Dr. Osman obtained Ph. D. in Civil Engineering (Specialization in Environmental Engineering) on Nov, 1995 from IIT Kharagpur, India has conducted research activity in the development of indigenous material to remove and recover Heavy Metal from industrial wastewater and M.Tech. in Civil Engineering (Specialization in Environmental Engineering) on April, 1988 from IIT Kanpur, India. Prior to that, he obtained B. Sc. (Civil Engineering) from Chittagong University of Engineering & Technology, Bangladesh (erstwhile Chittagong Engineering College under Chittagong University) on Sept, 1984. Having Ph. D. in Environmental Engineering he has more than 30 years of teaching and Consultancy experiences in Bangladesh. He has many research publications in international journals, conferences and symposiums and attended at numbers of environmental related seminar/symposium and workshops. He organizes several international, national conferences and provided input as trainer on number of training courses on Climate and Water Supply and Waste Management related issues. He has working experience in Teaching and research projects on Environmental Impact Assessment (EIA) of Power Plant project, Industrial Pollution Control/ Management, Drinking and Industrial Water Treatment, Municipal, Rural and Environmental sanitation, and has good command in structural design of buildings. He is involved in training more than 500 trainees in 52 industrial facilities along with Local Assistants for implementing EMS according to ISO-14001. Besides he worked as Team leader in numerous private environmental projects preparing IEE and EIA reports and environmental training in Bangladesh. He is also experienced in preparing EIA reports and preparation of Environmental Management Plan (EMP).