Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.4.Issue.3.2017 (July-Sept) **ISSN:2455-0221(P), 2394-2606(O)**

ENVIRONMENTAL ADMINISTRATION FOR SCOURING SEDIMENTS- THE REQUIREMENT OF UNINDUSTRIALIZED NATION

ALI FARAG ALZNAD

Azzaytuna University, Faculty of Agriculture, Department of Environmental Science, Libya.

alialzanad63@gmail.com

ABSTRACT

Methodical research has depicted the effects of burrowing, a lowered expulsion process for navigational purposes or material extraction, and has shown its relationship with different substances, natural affects. Along these lines, they have applied much natural association in the burrowing industry to achieve its awkward effects. Making nations may have different processes towards their burrowing biological organization to appear differently in relative to their association particles with higher money related quality. Scientific evidence to choose an informed decision is every now and again missing, in this way affecting the amount of calculation executed at these nations, interesting their undertakings to pre-serve nature. This paper overviews the burrowing biological affects and its two critical parts, burrowing advancement and sediment brand name that chews the enormity of effects through composing review, and discusses the requirement for a more joined burrowing regular man-agree to be made for production nations.

Key words: Environment, Lacking, Nation, Industry, Management.

1. Introduction

Decreasing of invertebrate species in view of buildup change, in-wrinkle of oxygen request since of re-suspension of residue that moreover affects lighting force, and augmentation of turbidity levels achieved by tufts, can be set off by pulling, scooping and dumping acts while burrowing. Other than the common effects, connecting issues including cost, open insight, rules and guidelines, monetary and regulatory pieces of diving have gotten over the top idea throughout the latest couple of years. This begins from how burrowing has extended looked for after on account of different endeavors, from the diminishing of the seabed of River Scheldt and the augmentation of Panama Canal to the progression of endeavors in India for the improvement of ports considering extended waterborne transportation. Trades over the sensibility of burrowing practices have ascended alongside its predominance, highlighting the necessity for research in looking over its practicality subject to its con-acting issues including from natural, money related and regulatory points. Such an assessment has come up short.

Different pioneers including immaculate lists, lawmakers or hipsters can exceptionally enhance dynamic methods of burrowing industry, and much of the time, clashing viewpoints are imparted during dealings and assessments. In various endeavors, various improvement adventures have enjoyed indispensable environmental organization that of-ferns far reaching examination by planning different normal man-argument instruments to achieve a sensible and viable decision. Multi-measures decision examination (MCDA) has been commonly used to rank options subject to the assessment of different models. This gadget has previously been applied alongside comparative danger examination, flexible organization, life cycle examination and risk assessment butt-driven sis). Possibly unequal costs achieved by considering one edge alone, for instance, using residue quality examination just to portray contamination level in a burrowing zone, in burrowing dynamic have made floods of worry among burrowing accomplices. Thusly, progression of a

Research Article

Copy Right ©KY Publications

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.4.Issue.3.2017 (July-Sept) ISSN:2455-0221(P), 2394-2606(O)

sensible powerful technique for burrowing, considering the issues analyzed above, is a need. This paper assesses burrowing regular impacts and its two huge parts (burrowing advancement and residue brand name)

2. Ransacking machineries

Expulsion, transport and evacuation of buildup are the three ruling periods of burrowing works out (Fig. 1). These are logically reiterated until a target measure of buildup is burrowed (Thorn, 1975), with each stage requiring different advances. Master-cally, and as the burrowing industry has made, progresses have improved, and today different dredgers are open to be utilized for different applications. Burrowing starts with the revealing of leftovers at a site with a water driven or possibly mechanical shaper Various kinds of dredgers are required for different buildup and profundities, anyway near extraction systems may be required for both capital and bolster burrowing, whether through force or get. Trailer dredgers are commonly used afloat, and create by pulling their shape along the seabed, removing free buildup until the compartment is full and arranged for evacuation. Then again, stay dredgers are conned to little areas, for instance, lakes and port dishes, and move by catch just as water driven spud: a bit of dredger that invaded into the sea or stream beds to hold security while burrowing. Pit excavators and bar skimmers are commonly used to isolate residue from stream beds. Excavator dredgers, following force compartment dredgers and shaped attractions dredgers are among various kinds of dredgers a great part of the time used to date Dug buildup are then moved into holder cargo vessels or pipelines using pull pipes, transport lines, can or grab. The compartment cargo vessels or pipelines by then vehicle the burrowed residue to the normal evacuation site. Burrowing regularly still occurs during transport when the demonstration of bounty burrowing is applied, which incorporates the continuation of burrowing after the compartment is full, with the flood volume delivered over the older weirs at last, we organize the burrowed sediment at a picked site. Two methods are available for this, including fomentation dumping, side expecting, dumping in remanding bowls, dump remanding activity elations, or direct siphoning shoreward. Untamed water evacuation is the most judicious and used procedure, with holder cargo ships as the standard strategies for transport. During open evacuation, the burrowed sediment are blasted to the relegated dumping site and organized through its base entryway .Another system is the usage of pipelines to siphon the burrowed residue onto land. This technique consolidates stacking sediment into the holder, delivering them through pipelines; and a while later siphoning them on solid land. During open evacuation, either buildup blinds or impacts may be used to contain suspended residue in order to thwart dispersal and help sedimentation. An impact is a staggering structure including a plastic spread, connectors, skirt, tension part and offset weight which is trapped to an air or solid float (Dreyer, 2006). A brought down or floating buildup window trimming contains a strain part, balance weight, catch and. In any case, there is worry with respect to their use due to the threat of infection spillages. Open expulsion is generally not permitted when dealing with outstandingly corrupted buildup .Corrupted burrowed buildup consistently requires remediation, for example through mechanical mixing and air course. Other remediation strategies join progressive extraction systems, pre-treatment, physical separation arrangements, guideline, washing, warm extraction, bioremediation, electro vitality, solidification/alteration, vitrification, and ingredient. An extensive parcel of these classifications are dependably extravagant; at any rate precise burrowing can cut down the burrowing cost by forestall mination of burrowing significance subject to the defilement level prior burrowing. This methodology can in like manner give a positive circumstance to the benthos.

Research Article
Copy Right ©KY Publications
Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in
A Peer Reviewed & Refereed, International Open Access Journal
Vol.4.Issue.3.2017 (July-Sept) ISSN:2455-0221(P), 2394-2606(O)

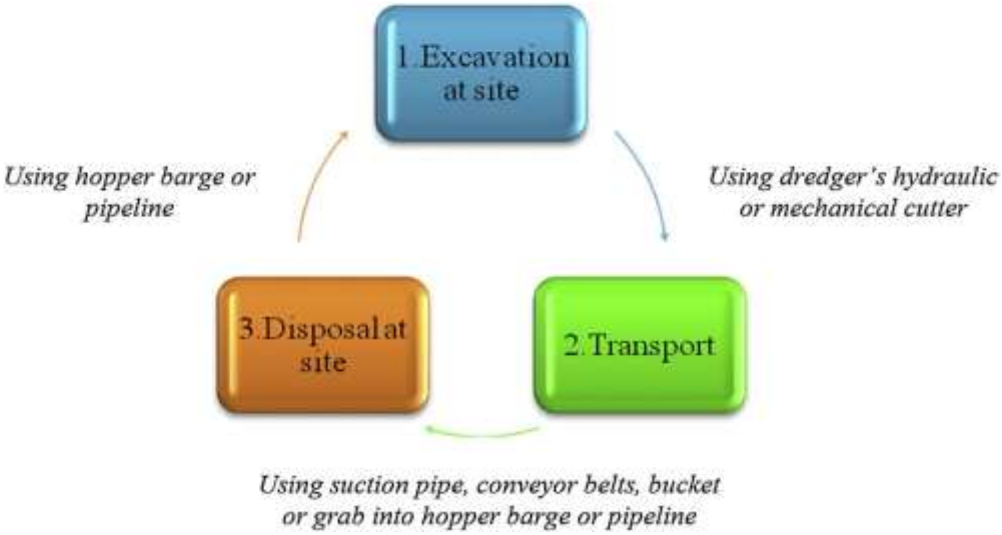

Fig. 1. Stages of dredging

3. The influence of sediments physiognomies

Dregs attributes allude to the job of silt as a contaminant source. Residue go about as a sink in that they adsorb and hold contaminants that have chosen the base of streams and marine waters, originating from both point and diffuse sources Point sources, defined as identifiable sources, incorporate waste dumps, direct effluent from industry and family effluent On the other hand, instances of diffuse sources, defined as dubious sources, incorporate enduring, barometrical statement, disintegration, sewer framework residue and mining follows (Parkhill,2002;Salomons and Brils, 2004). Notwithstanding, the degree of supplements can increment because of human exercises, for example, through the arrival of compost borne supplements utilized in agri-culture. Alongside nu-trients, residue likewise hold and transport metals including Zn, Hg, Cd, As, Pb, Cu and Ni. Among the wellsprings of these metals are endured sedimentary rocks and submerged volcanic activities. The utilization of synthetic substances in different enterprises, including pharmaceutical, materials and agribusiness additionally brings about the arrival of unstable and dissolvable natural mixes into the earth, which simultaneously shows that human exercises can Artificially increment metal and natural focuses.

Silt Quality Guidelines (SQGs) have been utilized to screen conceivably sullied dregs before digging, despite the fact that this is definitely not an administrative necessity (Burton, 2002;Wenning,2005). As of now in the US, Ireland, the UK, Belgium and Canada, SQGs are utilized to decide the residue's degree of defilement at a digging site, albeit still not in light of administrative requirements (Pan, The National Oceanic and Atmospheric Administration. SQGs are used to assess the nature of dug silt so as to help shield both the earth and people from defilement presentation (Burton, 2002). This implies if the dregs surpass the rule esteems, it gets important to think about an option innovative intends to deal with them (O'Connor, 1998). Alongside SQGs, Water Guideline Values(WGVs) are utilized to screen the concoction boundaries of the water section influenced by digging tasks. WGVs can be resolved from two perspectives: water quality in sea-going water frameworks; and nature of water proposed for consumable use. They are normally gotten from either concentrates on people or creature harmfulness, yet the last is all the more generally utilized.

Research Article
Copy Right ©KY Publications
Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in
A Peer Reviewed & Refereed, International Open Access Journal
Vol.4.Issue.3.2017 (July-Sept) **ISSN:2455-0221(P), 2394-2606(O)**

3. Scouring environmental influences

The simplest method to comprehend the ecological effects of digging is through a conventional source pathway target evaluation of dangers. With the sources secured under silt qualities before, and with pathways of contaminants mostly connected with transport of residue and consequently reliant on digging advancements, a reasonable model delineating source, pathway and target linkages is introduced in Fig. 2. This figure additionally showed instances of effects that could be because of the exercises of digging in particular physical effects (PI), substance affects (CI) and organic effects (BI).

Understanding dregs of defilement requires examining the wellsprings of contamination. Mechanical of-points and sedimentary rocks speak to point and diffuse hotspots for sullied silt, separately. From such sources, contaminants can disperse into groundwater, be delivered through precipitation, or be moved by silt into surface water, and nearly adsorbed and held in residue on ocean or stream beds (De Nobili et al., 2002; Jain and Ram, 1997; Moss et al., 1996). Essentially, contaminant pathways into the earth are through media including residue, air, groundwater, surface and marine water. Through contaminant precipitation, retention or direct annuity from point and diffuse sources into the media, contaminants are held or shipped straightforwardly into surface and marine water (Jain and Ram, 1997; Moss et al., 1996). Bioaccumulation can trail this in food web networks set off by the unsettling influence of silt, including from digging activities.Fig. 2 outlines that ecological effects of digging can occur during extraction, trailed by transport and removal of dug dregs. Dregs extraction causes an assortment of im-settlements, including dispersal of contaminants from silt into the water, change in seabed surface, arrangement of digging crest and presentation of benthos and ashes to pollution. They then ship the dug dregs to assigned removal locales. The effects of these two phases can incorporate bioaccumulation, sullying introduction, change of residue type and ascend in turbidity level. Contaminant they have featured pathways including digging innovations and sit in Fig. 2. Instances of the danger of various innovation and its degree of sullying related with these pathways are summed up in Table 1. I discovered it that a low natural hazard as per organic boundaries is regularly connected with low defilement. Also, mechanical dredgers (counting mechanical scoop and clamshell) represented a lower natural hazard than water powered dredgers (shaped pull dredger). The ecological hazard as showed by synthetic boundaries stayed high at both site classes, paying little heed to the innovation utilized.

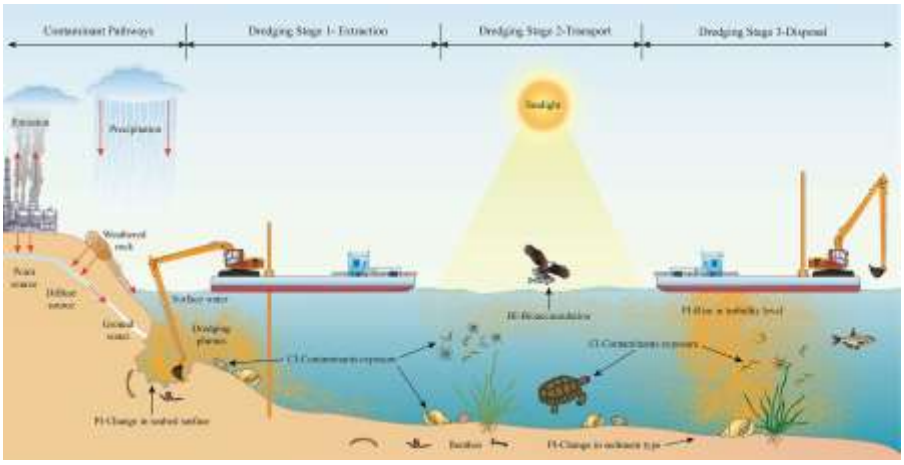

Fig. 2. Conceptual model for assessing dredging impacts.

Research Article
Copy Right ©KY Publications
Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in
A Peer Reviewed & Refereed, International Open Access Journal
Vol.4.Issue.3.2017 (July-Sept) ISSN:2455-0221(P), 2394-2606(O)

4. Causes to environmental impacts of dredging

Various potential foundations for digging affects, as delineated in the calculated model, are introduced fig 2. The fig shows that effects of digging are profoundly subject to the degrees of tainting of dug destinations and advances used. Further-more, the expansion in concoction boundaries that happens during digging and removal shows that the aggravation of dregs opens the environment to contaminants. Increments in the degrees of natural and inorganic mixes elevate the danger of contaminant presentation that can adversely influence mora and fauna. The change in physical boundaries further strengthens this point. While we have noticed it that some positive changes can happen during the different phases of digging, this audit regards those more as recounted and recommends that the effects are to a great extent inconvenient to the earth.

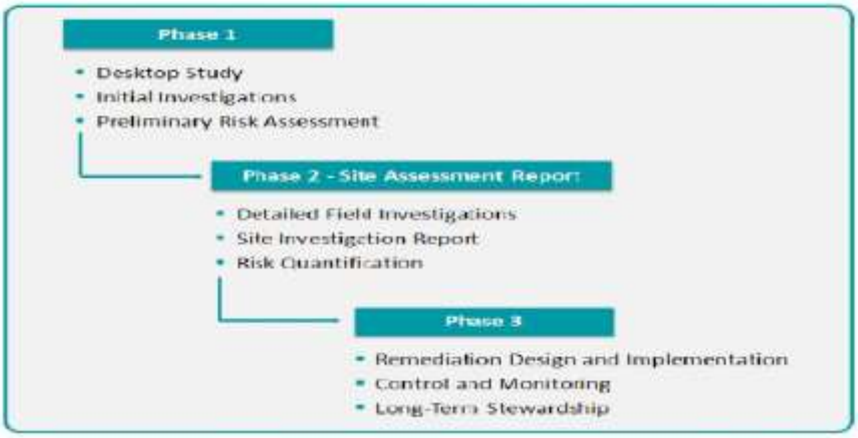

Fig. 3.the environmental impact and possible case

5 .Other dredging complications

Current legislative actions aiming to preserve the environment from dredging harmful effects, and their related problems, are lis- ted in Table 4. Another important issue relating to dredging is its high cost. The cost of dredging varies according to the technology and equipment used, estimated volume, type of dredged material, distance from excavation to disposal site, time and distance of mobilization and demobilization, and disposal method. The high cost has always been the main problem for port operators, who are responsible for dredging and maintaining deep channels, but also need to spend funds to expand or build new terminals in order to cater for growing trade activities (Anderson and Barkdoll, 2010; Williams, 2008). Although operational costs are perceived as the biggest issue by a number of dredging stakeholders, few papers have discussed or analysed the cost of dredging. For example, Lee (2011) attempted to create a framework for dredging cost, ana- lysing the construction operation process, type of river section, and the combination of equipment employed for river dredging. This analysis was based on historical data of river dredging projects conducted in South Korea (Lee et al., 2011).

Despite the fact that developing countries were estimated to become the largest dredging markets in the world over the next few years, stiff competition from foreign dredging contractors heightens the need to lower costs for local dredging contractors (George, 2011; Thacker, 2007). This, together with poor facilities and limited dredging and environmental expertise, increases the risk of environmental negligence in developing countries. In addi- tion to the issues faced in developed countries, dredging operators in developing countries, for example Malaysia, face an even greater challenge of limited funds (Barrow, 2005; Bartelmus, 1986). Although the maritime industry in Malaysia has been treated as a priority by its government (Ministry of

Research Article
Copy Right ©KY Publications
Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in
A Peer Reviewed & Refereed, International Open Access Journal
Vol.4.Issue.3.2017 (July-Sept) ISSN:2455-0221(P), 2394-2606(O)

Finance Malaysia, 2010; Mohamad, 2010; Tun Abdul Razak, 2010), this nation is facing a challenge in effectively monitoring the impacts of dredging. The sensitivity of its environment, which is deteriorating, makes it more critical to investigate the impacts of dredging at a national level (Spalding, 2001).

Table 1.Degreeding technologies

Dredging technology and level of contamination at dredged site	Environmental risk	Reference
Cutter suction dredger with cutter crown and sweep head (low)	38% Biological, 54% chemical[a]	Groote et al. (1998)
Mechanical shovel (low)	29% Chemical	Piou (2009)
Clamshell (low)	0% Biological	Su (2002)
Dragline and excavators (high)	55% Biological, 67% chemical	Ponti et al. (2009)
Mechanical shovel and bunds (high)	86% Biological	Ellery and McCarthy (1998)
Backhoe equipped with sieve bucket, excavator, auger dredger, silt curtains and oil boom (high)	80% Biological	Thibodeaux and Duckworth (2001)

6. Dredging environmental organization

We sketch natural association apparatuses that have recently been applied in the digging business out in Table 5. These incorporate instruments for examining and checking, information assortment, and vital observing and. Instances of apparatuses used for inspecting and observing incorporate Environmental Impact Assessment (EIA), Life Cycle Analysis (LCA) and hazard evaluation. Another arrangement of ecological administration instruments center on information assortment, with one model being the utilization of Geographical Information System (GIS).A mix of vital observing, arranging and the above is picking up help as an incorporated natural administration approach that means to accomplish manageable turn of events and boots benefits for society, the economy, and biological systems by coordinating and adjusting the issues of asset abuse, social and monetary exercises, and ecological conservation (Wang, 2006). They have grown various utilizations of this device combined with multi-measures choice investigation (MCDA), which means to make organized and defendable choices (Kiker, 2007). Incorporated ecological administration has a widely inclusive damnation; Wang (2006) has turned this idea as: "a procedure that intends to accomplish a workable turn of events and boost benefits for human culture and biological systems by adjusting asset misuse, financial exercises, and environ-mental insurance through go-activity and coordination of regulatory elements and partners" (Wang, 2006). Henceforth, coordinated ecological administration could give an organized structure to oblige various perspectives on partners, and identify the most fit size of activities towards tending to multi-measures and connecting issues, as looked by many nations (Antunes and Santos, 1999). We have found effective utilizations of this idea in the Integrated Coastal Management and the In-teg rated Coastal Zone Management, which is among the devices of theIntegrated Environmental Management (IEM) (Antunes and Santos, 1999; Pacheco et al., 2007).However, the focal point of past examination has mostly been on evolved nations, with fewer endeavors made tending to how they can apply these devices in creating nations. Created and creating nations have different essential concerns. In creating nations, the craving for monetary development and advancement regularly overshadows natural issues and concerns, while created nations frequently have the financial solidarity to put more noteworthy accentuation on ecological concerns (Vellinga, 2002).Understanding the reasonable model, as showed in Fig. 2, is a raised venture to help build up this system. Harsh ceepathwayereceptor linkages, as depicted in the applied model, offer various open doors for

Research Article
Copy Right ©KY Publications
Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in
A Peer Reviewed & Refereed, International Open Access Journal
Vol.4.Issue.3.2017 (July-Sept) ISSN:2455-0221(P), 2394-2606(O)

diminishing, dodging or alleviating natural effects. These measures can be applied by controlling the degrees of contaminants from point and diffuse sources, dealing with the pathways by utilizing fitting,

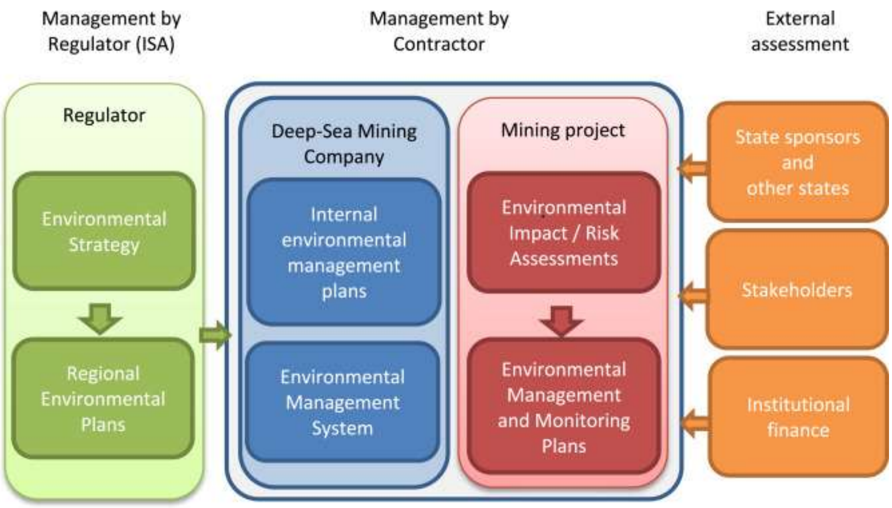

Fig 4. Dredging environmental organization

Ecologically agreeable advances and remediating dregs before removal, or by keeping away from earth delicate living spaces and securing touch natural targets.It is basic to use an apparatus for an ecological administration that relates these decisions to the more extensive issues of digging. The utilization of inter-ground natural administration has picked up help inside the digging business (Abriak et al., 2006; Agius and Porebski, 2008; Wang and Feng, 2007). Coupling subjective estimations with residue information assortment for the portrayal of drug locales could additionally reduce the reliance on scientific estimations, including dregs portrayal, in the digging choice mak-in process, subsequently making it more all-encompassing, coordinated and reasonable. One of the most striking endeavors on this was the approach for digging created at the Port of Dunkirk, France (Abriak et al., 2006; Junqua et al., 2006). It means incorporate describing drug destinations as showed by the residue and wellsprings of contamination, creating waste improvement alternatives, and deciding the most significant administration situation. Through the dynamic interest of digging experts, analysts and nearby networks, this procedure follows an incorporated natural administration approach, using hazard appraisal and Multi-Criteria Decision Analysis (MCDA) (Kiker, 2007). A variety to the Port of Dunkirk approach, as in Fig. 3, that portrays dug destinations as per residue, and which requires expensive information assortment, may be more fitting for creating nations. focussing on scientific information alone will dominate other significant digging contemplations.

Creating nations have a chance and an obligation to audit and gain from rehearses to support development without causing significant harm to their condition. Notwithstanding how creating nations were assessed to turn into the biggest digging markets on the planet throughout the following hardly any years, solid rivalry from unfamiliar digging temporary workers uplifts the need to bring down expenses for nearby digging contractual workers (George, 2011; Thacker, 2007). This, along with helpless offices and constrained digging and ecological aptitude, expands the danger of envi-nonmental carelessness in creating nations. Notwithstanding the issues looked in created nations, digging administrators in creating nations, for instance Malaysia, face a considerably more prominent test of restricted assets (Barrow, 2005; Bartelmus, 1986). Although they have treated the oceanic business in Malaysia as a need by its administration (Ministry of

Research Article
Copy Right ©KY Publications
Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in
A Peer Reviewed & Refereed, International Open Access Journal
Vol.4.Issue.3.2017 (July-Sept) ISSN:2455-0221(P), 2394-2606(O)

Finance Malaysia, 2010; Tun Abdul Razak, 2010; Mohamad, 2010), this country is confronting a chal-ledge in viably checking the effects of digging. The affectability of its condition, which is crumbling, makes it more basic to examine the effects of digging (Spalding, 2001). A significant collection of examination has surveyed the natural effects of digging, and many ecological administration instruments have been denoted endeavoring to control its antagonistic affects. By and by, the focal point of exploration has mostly been on devel-oped nations, with fewer endeavors made tending to how they can apply these devices in creating nations. Along these lines, further exploration adjusting the issues of digging especially for rising economies, for example, Malaysia is a need. A variety to the Port of Dunkirk procedure (Fig. 3) which requires exorbitant information assortment and difficult to actualize (Choueri et al., 2010), may be more fitting for creating countries.

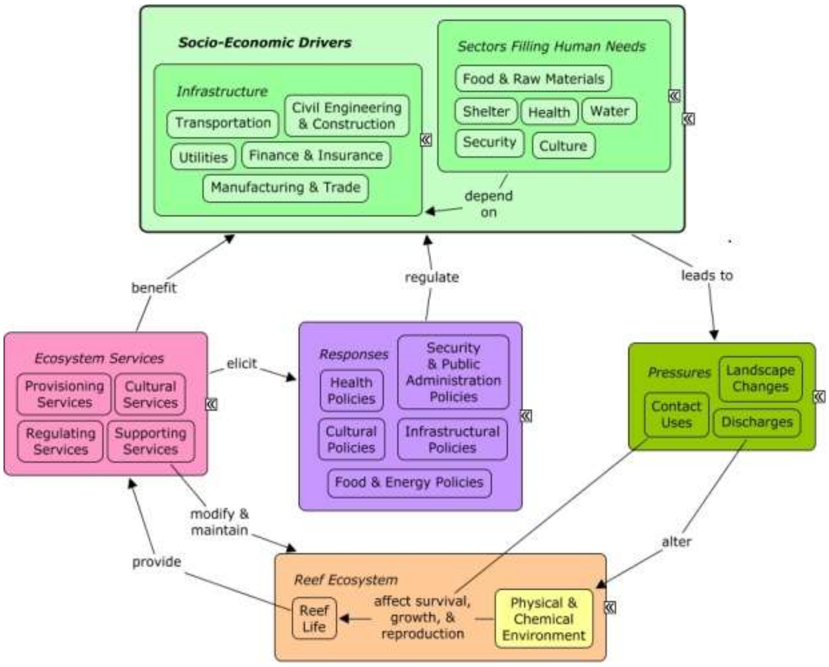

Fig. 5. Methodology for dredging

7. Discussion

They have appeared ordinary ecological administration apparatuses and investigations to just concentrate on specific angles such as economic or scientific proof, which isn't even and as often as possible evades other significant natural, financial, the board, or specialized concerns. Devices and investigations, which coordinate and parity various models during residue of the board dynamic, are a need. Creating and created nations may have various ways to deal with overseeing issues of digging and silt among the executives. Developed nations can stress the ecological issues because of their high buying power; anyway creating nations that take a stab at monetary quality might not have the advantage of doing so. In actuality, the lower the normal salary of a nation, the lower the strain to esteem nature becomes. In this way, a nation may choose a way to deal with natural administration relying upon its financial quality. The method can be responsive, open, valuable or proactive (Vellinga,2002). All things considered, nations with plentiful regular assets, for example, Malaysia ought not underestimate their biodiversity, as this fortune has been devalued throughout the years (Spalding, 2001).For nations that are endeavoring to upgrade the personal satisfaction of their kin, (for example, Malaysia and its 2020 Vision), the fast improvement towards a solid economy may decline the decreased natural status. It ought to be noted by nations, for example, Malaysia that the spearheading nations

Research Article

Copy Right ©KY Publications

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.4.Issue.3.2017 (July-Sept) ISSN:2455-0221(P), 2394-2606(O)

of the modern insurgency, the UK and the US, are as yet paying their obligations to the earth by home-dialing tainted terrains, because of their verifiable quick turn of events. It is basic for nations, for example, Malaysia which despite everything fall into the creating class to change their viewpoint now from responsive towards proactive, as for dealing with the effects of dredging. It is undisputed that the Environmental Impact Assessment (EIA) framework in creating nations is frail and without dismissing the financial angle, in this way a hazard based method for incorporated natural administration structure offering a holistic and coordinated system that can improve the protection of condition of these nations is a need .

8. Conclusion

This broadsheet shows the requirement for a coordinated way to deal with digging natural administration that merges environ-mental ramifications and the unsettling influence of biological system harmony, which as exhibited shift as showed by residue properties and the innovation used, notwithstanding the financial contemplations which overwhelm the procedure, to be specifically produced for digging at creating nations. The extra worries of administrative difficulties, negative open discernment and cost should likewise be considered, in this manner making the requirement for a more coordinated way to deal with digging the board.

References

1. Abriak, N., Junqua, G., Dubois, V., Gregoire, P., Mac Farlane, F., 2006. Methodology of management of dredging operations I. Conceptual developments. Environ. Technol. 27, 411e429.
2. Agius, S., Porebski, L., 2008. Towards the assessment and management of contaminated dredged materials. Integr. Environ. Assess. Manag. 4, 255e260.
3. Ahammed, R., Harvey, N., 2004. Evaluation of environment impact assessment procedures and practice in Bangladesh. Impact Assess. Proj. Apprais. 22, 63.
4. Alshuwaikat, H.M., Rahman, S.M., Aina, Y.A., 2007. The rationale for SEA to over- come the inadequacy of environmental assessment in Bangladesh. J. Environ. Dev. 16, 227.
5. Alvarez Guerra, M., Viguri, J., Voulvoulis, N., 2009. A multicriteria-based method- ology for site prioritisation in sediment management, Environ. Int. 35, 920e930. http://dx.doi.org/10.1016/j.envint.2009.03.012.
6. Anderson, M.J., Barkdoll, B.D., 2010. Incorporation of air emissions in dredging method selection. J. Waterw. Port Coast. Ocean Eng. 136, 191e199.
7. Briffett, C., Obbard, J., Mackee, J., 2004. Environmental assessment in Malaysia: a means to an end or a new beginning? Impact Assess. Proj. Apprais. 22, 221e233.
8. Burton Jr., G. Allen, 2002. Sediment quality criteria in use around the world. Limnology 3, 65e76.
9. Constantino, R., 2009. Clam dredging effects and subsequent recovery of benthic communities at different depth ranges. Mar. Environ. Res. 67, 89e99.
10. Crowe, S.E., Gayes, P.T., Viso, R.F., Bergquist, D.C., Jutte, P.C., Van Dolah, R.F., 2010. Impact of the Charleston Ocean Dredged Material Disposal Site on nearby hard bottom reef habitats. Mar. Pollut. Bull. 60, 679e691.
11. Cruz-Motta, J.J., Collins, J., 2004. Impacts of dredged material disposal on a tropical soft-bottom benthic assemblage. Mar. Pollut. Bull. 48, 270e280.
12. Den Herder, A., 2010. Suction dredger for transporting sand and shingle from bottom of the sea has belt located in centerline of the suction dredger when used and is designed such that distribution belt can swivel at both sides of the suction dredger backwards. EP168527:0-8.

Research Article
Copy Right ©KY Publications
Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in
A Peer Reviewed & Refereed, International Open Access Journal
Vol.4.Issue.3.2017 (July-Sept) ISSN:2455-0221(P), 2394-2606(O)

13. Department of Fisheries Malaysia, 2010. Annual Fisheries Statistic, pp. 1e45.Department of Environment Malaysia, 2007. Environmental Impact Assessment (EIA) Guidance Document for Sand Mining/Dredging Activities.
14. Department of Irrigation and Drainage Malaysia, 1997. Guidelines on Erosion Control for Development Projects in the Coastal Zone DID 1/97.
15. Douvere, F., Ehler, C.N., 2009. New perspectives on sea use management: initial findings from European experience with marine spatial planning. J. Environ. Manage. 90, 77e88.
16. Eisma, D., 2006. In: Eisma, D. (Ed.), Dredging in Coastal Waters.
17. Elander, P., Hammar, T., 1998. The remediation of Lake Jarnsjon: project imple- mentation. Ambio 27, 393e398.
18. Ellery, W., McCarthy, T., 1998. Environmental change over two decades since dredging and excavation of the lower Boro River, Okavango Delta, Botswana.J. Biogeogr. 25, 361.
19. Emang, J.J.J., 2006. Public Participation in EIA Process in Sarawak: Any Room for Improvement?.
20. European Environment Agency, 2003. Environmental Indicators: Typology and Use in Reporting.
21. Garrett, R.G., 2000. Natural sources of metals to the environment. Hum. Ecol. Risk Assess. 6, 945.Ge, Y., Sun, J., He, R., 1999. Spiral reamer type dredger. CN110894.
22. George, C., 2011. Obstacles an opportunities. Dredg. Port Constr. Jan. 2012, 26e29. Gibb, B., 1997. Dredging, environmental issues and port experience in the UnitedStates. Marit. Policy Manag. 24, 313e318.
23. Government of Malaysia, 5th November 1987. Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987.
24. Groote, J.D., Dumon, G., Vangheluwe, M., Jansen, C., 1998. Environmental moni- toring of dredging operations in the Belgian nearshore zone. Terra Aqua 70, 21e25.
25. Herbich, J.B., Brahme, S.B., 1991. Literature Review and Technical Evaluation of Sediment Resuspension during Dredging.
26. Highley, D.E., Hetherington, L.E., Brown, T.J., Harrison, D.J., Jenkins, G.O., 2007. The Strategic Importance of the Marine Aggregate Industry to the UK.
27. Holt, M.S., 2000. Sources of chemical contaminants and routes into the freshwater environment. Food Chem. Toxicol. 38 (Suppl. 1), S21eS27.
28. Katsiri, A., Pantazidou, M., Damikouka, I., Kontogiorgi, C., Tringali, A., 2009. Disposal options for dredged marine sediments based on physicochemical and toxico- logical characterization. Glob. NEST J. 11, 449e456.
29. Kizyaev, B.M., Golubev, N.K., Bass, V.N., 2011. Method to clean canals and waterways from sediments includes working and washing of sediments with a hydraulic dredger into a dump arranged in a near-bed zone and fenced with banking dams along the whole perimeter. RU145021:0-1.
30. Klein, J., 1998. Sediment dredging and macrophyte harvest as lake restoration techniques. Land Water 42.3, 10e12.
31. Lin, J., Liu, X., Su, Y., Wang, S., Zhao, L., 2010. Quickly desalting dredger fill by pre- paring desulfurization gypsum containing calcium sulfate dihydrate, main- taining dredger fill at specified water content, and mixing dredger fill and desulfurization gypsum. CN10169368:0-5.
32. Linkov, I., Seager, T.P., 2011. Coupling multi-criteria decision analysis, life-cycle assessment, and risk assessment for emerging threats. Environ. Sci. Technol. http://dx.doi.org/10.1021/es100959q.

Research Article

Copy Right ©KY Publications

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.4.Issue.3.2017 (July-Sept) **ISSN:2455-0221(P), 2394-2606(O)**

33. Manap, N., Voulvoulis, N., 2014a. Risk-based decision-making framework for the selection of sediment dredging option. Science of the Total Environment 496, 607e623. http://dx.doi.org/10.1016/j.scitotenv.2014.07.009.
34. Manap, N., Voulvoulis, N., 2014b. Environmental Screening Method for Dredging in Contaminated River. Applied Mechanics and Materials 567, 50e55. www. scientific.net/AMM.567.50.
35. Nippon, C.C.L., 1996. Dredging method of sand, earth and colloidal sediments from dams, lakes e has first conveyor partly laid on ground and partly on water with float bodies connecting second conveyor through transfer device for dredge transportation.
36. Nittrouer, C.A., Austin Jr., J.A., Field, M.E., Kravitz, J.H., Syvitski, James P.M., Wiberg, P.L., 2007. Writing a Rosetta stone: insights into continental margin sedimentary processes and strata. In: Special Publication Number 37 of Inter- national Association of Sedimentologists, pp. 1e38.
37. Nippon, C.C.L., 1996. Dredging method of sand, earth and colloidal sediments from dams, lakes e has first conveyor partly laid on ground and partly on water with float bodies connecting second conveyor through transfer device for dredge transportation.
38. Nittrouer, C.A., Austin Jr., J.A., Field, M.E., Kravitz, J.H., Syvitski, James P.M., Wiberg, P.L., 2007. Writing a Rosetta stone: insights into continental margin sedimentary processes and strata. In: Special Publication Number 37 of Inter- national Association of Sedimentologists, pp. 1e38.
39. Piou, S., 2009. Changes in the geochemistry and ecotoxicity of a Zn and Cd contaminated dredged sediment over time after land disposal. Environ. Res. 109, 712e720.
40. Quimby, W.J., 1914. Digging and dredging machinery. United States Patent Office 564704.
41. Reba, B.V., 1975. Anchoring for floating dredger with cables, winches and anchors e has bow and stern cables guided over hydraulic cylinder-operated pulleys. NL016200.
42. Riley, J.P., Chester, R., 1971. Introduction to Marine Chemistry. Academic Press Inc. (London) Ltd., London.
43. Rothwell, J.J., Dise, N.B., Taylor, K.G., Allott, T.E.H., Scholefield, P., Davies, H., Neal, C., 2010. A spatial and seasonal assessment of river water chemistry across North West England. Sci. Total Environ. 408, 841e855
44. Schexnayder, C.J., 2010. Panama Canal Project Revs Up With New Award. ENR 265, 1. Schnell, L.L., 1984. Water dredging hydraulic or pneumatic excavator bucket wheel e has pressure feed pipe opening into protruding ring socket joined to casinglinked with conveyor pipe. DE3220797:0-15.
45. Shigaki, F., Kleinman, P.J.A., Schmidt, J., Sharpley, A., Allen, A., 2008. Impact of dredging on phosphorus transport in agricultural drainage ditches of the Atlantic coastal plain. J. Am. Water Resour. Assoc. 44, 1500.
46. Thibodeaux, L.J., Duckworth, K.T., 2001. The effectiveness of environmental dredging: a study of three sites. Remediat. J. 11, 5e33.
47. Thorn, M.F.C., 1975. Loading and consolidation of dredged silt in a trailer suction hopper dredger. In: First International Symposium on Dredging Technology. B1- 1eB1-14.
48. Vianna, L.F. de N., 2004. A geostatistical GIS model to identify cadmium and zinc contamination risk areas in sediments of Sepetiba Bay, Rio De Janeiro e Brazil.J. Coast. Res. 39, 1488e1493. Special Issue.
49. Wang, Q., 2006. Toward integrated environmental management for challenges in water environmental protection of Lake Taihu basin in China. Environ. Manage. 37, 579e588.
50. Wilber, D.H., Clarke, D.G., Rees, S.I., 2007. Responses of benthic macroinvertebrates to thin-layer disposal of dredged material in Mississippi Sound, USA. Mar. Pollut. Bull. 54, 42e52.

51. Williams, C., 2008. Saint John hopes new research study will help manage dredging.Can. Sail. 14.

52. Zeman, A., Patterson, T., Calabrese, E.J., Kostecki, P.T., Dragun, J., 2006. Character- ization of Contaminated Sediments for Remediation Projects in Hamilton Harbour e Risk Assessment and Remedial Approaches towards Restoration and Management of Contaminated Rivers, pp. 401e421.

53. Zhang, R., Zeng, F., Liu, W., Zeng, R.J., Jiang, H., 2014. Precise and economical dredging model of sediments and its field application: case study of a river heavily polluted by organic matter, nitrogen, and phosphorus. Environ. Manage. 53, 1119e1131.

54. Zühlke, R., 1994. Response of macrofauna to drifting tidal sediments. Helgol. Mar.Res. 48, 277e289.