

Bio-remediation of Sewerage Water for Safe Food Production in Peri-urban Areas

Current Situation

- About 4500 million cubic meter
- wastewater is generated in Pakistani
- urban areas and it is used for vegetable production
- The rural areas also contributing, almost
- 2200 million cubic meter of the wastewater
- Ignorance of wastewater management
- means Rs.114.0 billion health cost
- Wastewater loss means deficiency of water
- for irrigation and loss of treated organic material for organic soil fertility
- Loss of fish production and bio-diversity
- in rivers and fresh water ways is about five
- billion dollars
- More than 40% of wastewater treatment
- facilities are developed in Europe and
- north Americas through bio-remediation



Why Bio-remediation

- Semi-urban areas vegetable production with untreated city domestic and industrial wastewater
- Cost effective, already went through experimentations
- Ready for replication with labor intensive mechanism
- No chemical and mechanical requirements,
- Pakistani climatic conditions are favorable for bio-remediation technology
- Technical capacities: established 3 sustaining and functional bio-remediation facilities at NARC since 2008
- Replications outside NARC: with collaboration of development, public and corporate partners following facilities established Punjab 4, Sindh 5, Baluchistan 1, KPK 4, AJK 1 at village level and 40 household level facilities



Issues/Challenges

- Mostly the vegetable and salad leaves production is with the irrigation of untreated wastewater production of domestic and industrial sector
- Sensitization of the gravity of the issue of ignoring wastewater management
- Promotional and understanding issues with relevant stakeholders (municipalities and rural communities)
- Lack of trained manpower for large scale replications
- Non availability of aquatic plants harvest & processing machinery
- Issues in customized bio-remediation inputs production
- Difficulties in provision of effective and living microbial consortia at regional levels and wastewater testing facilities

- Standardization for replications according to local climate conditions (zoning)
- Certification for replication

Implementation Strategy

- Prioritizing & sensitizing the issue with respect to its dangers (awareness)
- Cooperative undertakings with local, provincial, national & international relevant partners (Collaborations)
- Establishing financially & technically sustaining sites (Technology Modeling)
- Promotion of associations with private, public and development sector organizations (Partnerships)
- Promotional campaigns with concerned stakeholders (Marketing)
- Establishing mechanisms and operating standards (Standardization & Certification)
- In the first quarter of the program the bio-remediation team has capacities to develop function bio-remediation sites for training & demonstration;



Three in capital territory, two for each province, one for each AJK and Gilgit Baltistan

Benefits

- Cultivation of vegetables and high valued crops with treated wastewater through bio-remediation reduces water related disease cost
- Develop esthetic beauty of the outskirts of urban areas with improved bio-diversity
- The wastewater production from Pakistani urban centre (s) can provide approximately the amount of 40 Rawal dams water volume (dam capacity 103.4 million cubic meter/year)
- In general estimation approximately 18.63 million acre wheat crop can be irrigated annually with the above water availability