NDC
Technology Roadmap Development

Stakeholder Sesitization Report

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List of Abbreviations

NDC	Nationally Determined Contributions
GGC	Green Growth Consultants
GGGI	Global Green Growth Institute
SWOT	Strengths, Weaknesses, Opportunities, Threats
AJK	Azad Jammu and Kashmir
GB	Gilgit-Baltistan
MW	Megawatt
HPP	Hydropower Plants
MSW	Municipal Solid Waste
IoT	Internet of Things
GIS	Geographic Information System
UNHCR	United Nations High Commissioner for Refugees
UNDP	United Nations Development Programme

1. Introduction

The project titled "NDC Technology Roadmap for Water and Waste Sectors in Pakistan" emphasizes the critical role of technology in climate adaptation and mitigation efforts, particularly in a nation as vulnerable as Pakistan.[1] As outlined in Pakistan's Nationally Determined Contributions (NDC) and National Climate Change Policy, technology-based interventions are pivotal for achieving climate resilience and low-carbon development. Given the urgency of the situation, stakeholders from various sectors are integral in ensuring a smooth, data-driven, and collaborative process. Green Growth Consultants (GGC) and the Global Green Growth Institute (GGGI) recognize this urgency and are organizing stakeholder sensitization sessions across key provinces and regions, aiming to empower stakeholders and foster informed collaboration in the development of the Technology Roadmap. This inclusive approach is crucial for effectively addressing climate challenges and advancing sustainable development in Pakistan.

2. Methodology

GGC, in consultation with GGGI, has developed a comprehensive work plan. The main activities are noted as follows.

The team had completed the kick-off workshop that was scheduled for the 22nd of February 2024. The key features of this workshop included the initiation of the development of the Roadmap, the

[1] https://reliefweb.int/report/pakistan/climate-crisis-pakistan-voicesground#:~:text=According%20to%20the%20Global%20Climate,the%20years%201999%20to%202018.

organization of committees, and feedback from federal and provincial stakeholders to identify the priority sub-sectors within the water and waste sectors of Pakistan.

2.1. Stakeholder Sensitization

Stakeholder Sensitization workshops were held in Peshawar, Quetta, Lahore, Karachi, Gilgit, and Muzaffarabad as 01 hour long bilateral with key stakeholders. The **main goals** of the stakeholder sensitization workshop were:

- Disseminating the conclusions of the kick-off workshop and outlining the prioritized water and waste sub-sectors
- Highlighting and gathering the information required from provinces and administered regions (technology-needs assessment, economic analysis for technology interventions in the water and waste sectors, etc.)
- Gather feedback on possible themes/ideas to develop 01 funding concept note for either the water or waste sector
- Empower and motivate stakeholders
- Foster ownership and inclusive action

3. Results (Province-Wise)

A questionnaire was developed, that served three primary objectives: Firstly, it aims to identify potential water and waste sector technology projects for funding consideration by gathering information on existing projects and relevant feasibility documents. Secondly, it seeks to prioritize

Technologies for these sectors, gathering insights on additional options, suitability, barriers to implementation, market assessments, and SWOT analyses. Lastly, it aims to understand stakeholder involvement in the formulation of the province's Nationally Determined Contributions (NDC) Implementation Plan, particularly in prioritizing water and waste sub-sectors, to glean insights for future decision-making and actions. Questionnaires were presented to stakeholders from the provinces/regions during the stakeholder sensitization meetings, and the following responses were recorded. The list of the participants is also attached as **ANNEX-I**.

3.1. Bankable Projects

Multiple stakeholders provided information on the bankable projects, giving their names, and other important details as well. The list of all the projects pointed out by the provincial representatives is attached to the **ANNEX-II** below.

In **Azad Jammu and Kashmir (AJK)**, several projects are in the pipeline for funding, including small runoff river projects like the Nagdar and Dowarian Hydropower Projects. Additionally, schemes such as the Greater Water Supply Scheme and the construction of sewage treatment plants in Muzaffarabad are being considered. Furthermore, solarization of tube wells for irrigation is underway, especially in southern parts of AJK. Feasibility studies and environmental approvals for these projects are available upon request.

In **Gilgit Baltistan**, a range of bankable projects are in line in the water and waste sectors. These projects encompass various initiatives such as the establishment of waste management companies focusing on waste collection and recycling technologies in collaboration with multinational

corporations like Nestle and Coca-Cola. Additionally, significant efforts are directed towards water resource management, including the construction of lift water supply systems with solarization and hydropower projects across different regions. Moreover, initiatives like the Safe Drinking Water and Sanitation Project and the mainstreaming of Sustainable Development Goals (SDGs) through the MAPS Project underscore the region's improve public health, likelihoods and promote environmental sustainability.

In **Balochistan**, initiatives like waste segregation and rainwater harvesting are hindered by financial constraints but plans for waste management and sanitation guidelines are in place. Relevant documents can be obtained via email.

In **Sindh**, projects such as greywater harvesting and treatment and sewage treatment plants in Lyari are underway. Information on these projects can be found on the Sindh Irrigation & Drainage Authority website.

In **KPK**, responses highlighted a variety of ongoing and proposed initiatives within the water and waste sector eligible for funding. These encompassed projects such as the Wastewater Treatment Plant in Peshawar City, Marble Slurry Management, and the establishment of Combine Effluent Treatment Plants. Additionally, several projects were mentioned, including the Temergara Gravity Water Supply Scheme and the Solarization of Existing/New Water Supply Schemes, reflecting a diverse range of endeavors aimed at addressing water and waste management challenges in the province. Documents providing feasibility studies and assessments were cited to support these project proposals, indicating a solid groundwork for potential implementation.

In **Punjab**, A landfill gas capture project proposal has been submitted, for which a concept note is available as a reference. Feasibility studies and detailed designs are underway for wastewater treatment plants at Mohlanwal and Ferozepur Road. Current barriers to implementation include limited technical capacity and high construction/operation costs.

3.2. Technology Prioritization

In **Azad Jammu and Kashmir (AJK)**, for the **Water Sector**, most of the stakeholders voted for drip irrigation, Sprinkle irrigation system, Solarization of tube wells for irrigation, Solar powered high efficiency irrigation system (HEIS), in the domestic subsector, giving 3 votes to each technology. In the domestic sub-sector, rainwater harvesting, water efficient fixtures, chlorination, and flocculation, giving 3 votes to each, and for the Hydropower Sector, Mini/Micro HPPs, Remote Sensing for inventory making, and run-off river hydropower plants, got 2 votes each. The emerging technologies highlighted in the water sector are the Solar power storage system (2 votes) for the agriculture sub-sector, Pumped hydropower storage for Hydropower (2 votes) Sub-sector, and all the emerging technologies got equal votes (2) for the domestic sub-sector. In the **Waste Sector**, for the MSW sub-sector, segregation, composting, and engineered landfill/landfill gas recovery, got the highest votes (2 votes each). For the Plastic Sub-sector, Downcycling got the highest votes (2 votes), and for the agriculture waste, livestock feeding got the highest votes (3 votes). The emerging technologies noted in all the sub-sectors got equal votes, showcasing their importance. Furthermore, the stakeholders emphasized on the importance of integrating fish-friendly technologies and sediment load management tools into runoff river projects to minimize environmental impact. Additionally, the proposal to implement SCADA systems for water quality assessment reflects a proactive approach to ensure water safety. However,

despite the potential benefits, financial constraints pose a significant barrier to the widespread adoption of these technologies, highlighting the need for robust funding mechanisms.

In **Balochistan**, for the **Water Sector**, multiple technologies got the highest votes (3 votes) for the Agriculture Sector, Rainwater Harvesting (4 votes) was prioritized for domestic, and Micro HPPs (3 votes) for the Hydropower sub-sector. The emerging technologies are solar-powered storage systems for Agriculture and Hydropower sub-sectors, and Remote Sensing for the Domestic Sub-sector. In the **Waste Sector**, segregation and landfills got the most votes (3 votes) for the MSW sub-sector, Downcycling (4 votes) for the plastic sub-sector, and Livestock feeding (4 votes) for the agriculture subsector. The emerging technologies noted were are Smart Waste Bins and automated collection systems (2 votes) for MSW, Non-biodegradable plastic pyrolysis (3 votes) for Plastic, and Bio-methanation (3 votes) for Agriculture Waste. There is a notable gap in the utilization of water retention technologies and urban wetland sectors, which could significantly contribute to water resource management and ecological preservation. The challenges identified, including limited capacity and funding, underscore the need for targeted capacity-building initiatives and investment strategies to overcome these barriers and unlock the potential of such technologies.

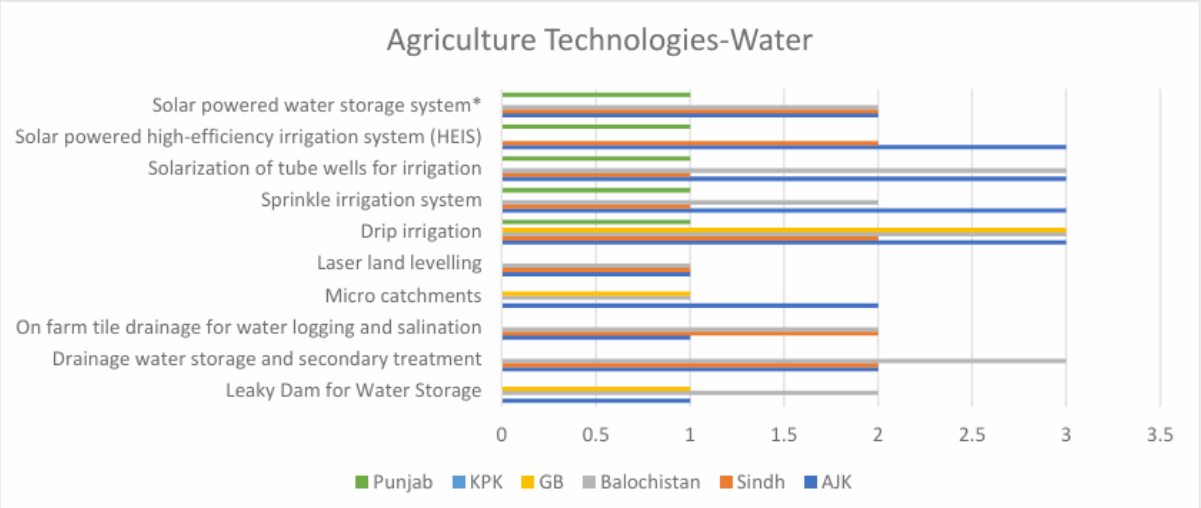
In **Sindh**, for the **Water Sector**, most of the technologies got equal votes for the agriculture sub-sector, rainwater harvesting (4 votes) got the highest votes for the domestic sub-sector, and Micro HPPs got the highest votes (3 votes) for the hydropower sub-sector. The emerging technologies prioritized for agriculture are solar-powered storage Systems (2 votes), remote sensing for water resource management (3 votes) for the domestic sector and solar-powered storage systems (3 votes) for the hydropower sub-sector. In the **Waste Sector**, Engineered landfill technology (5 votes) was prioritized for the MSW sub-sector, Downcycling for the Plastic Waste sub-sector, and Rice Straw Shredder (4 votes) for the agriculture sub-sector. The emerging technologies with the most votes are Smart Waste Bins (2 votes) for MSW, Non-biodegradable plastic pyrolysis (4 votes) for plastic, and Bio-methanation for agriculture waste sub-sector. Further, the focus shifted towards innovative solutions like wastetoenergy and rainwater harvesting, which could address both environmental and energy challenges. However, the lack of funding, expertise, and institutional capacity presents formidable obstacles to implementation. Despite these challenges, the availability of feasibility studies and market assessments for certain technologies suggests their potential cost-effectiveness and capacity to mitigate climate change impacts.

In **Gilgit Baltistan**, for the **Water Sector**, Drip Irrigation (3 votes) got the most votes for the Agriculture sub-sector, multiple technologies got the same votes for the domestic sub-sector, and run-off river plants (4 votes) were voted the highest for the hydropower sub-sector. Only the solar-powered storage system for the hydropower sub-sector was chosen as an emerging technology. In the **Waste Sector**, Engineered landfill technology was chosen with the most votes (4 votes) for MSW,
Downcycling (2 votes) for plastic, and Vermicompost (3 votes) for the Agriculture Waste sub-sector. Only the automated vacuum collection system (1 vote) was chosen as an emerging technology in the MSW sub-sector. The focus is on a comprehensive approach to sustainable development with a focus on waste management, water conservation, and renewable energy generation. For waste management, engineered landfill technology, incineration for hospital waste, and downcycling for plastic waste are key strategies, alongside the integration of vermicomposting for agricultural waste. Water conservation efforts include the adoption of drip irrigation for agriculture, IoT-based rainwater harvesting and greywater treatment systems for domestic use, and the construction of check dams to control runoff. The region also emphasizes hydropower generation through runoff river hydropower

plants and micro/small hydropower plants, leveraging remote sensing and GIS technologies for water resource assessment. Additionally, there's an overarching initiative to phase out single-use plastics, reflecting a broader commitment to environmental sustainability. These efforts align with climate resilience, adaptation, and community welfare goals in Gilgit-Baltistan.

In **KPK**, insights were provided into the selection and suitability of various technologies for the region. While no additional technologies were proposed by some respondents, one recommended the installation of SCADA systems on tube wells for groundwater management. Different criteria for prioritizing technologies were outlined, ranging from climate impact to benefits for vulnerable communities. Common barriers to implementation, such as lack of capacity and financial constraints, were acknowledged across the responses, underscoring the need for strategic planning and resource allocation to overcome these hurdles.

In **Punjab**, there exists significant attention requirement for wastewater treatment technologies such as Activated Sludge and Trickling Filters are recommended for wastewater treatment due to their environmental benefits and potential impact on vulnerable communities. Economical Waste Stabilization Ponds are noted but considered less effective in BOD/SS removal and requiring large land areas. A feasibility study for a wastewater treatment plant using Trickling Filters technology at Kattar Bund Lahore has been completed. Also, the lack of large-scale implementation is attributed to high costs and limited market assessment.


Agriculture Technologies-Water
Solar powered water storage system*
Solar powered high-efficiency irrigation system (HEIS)
Solarization of tube wells for irrigation
Sprinkle irrigation system
Drip irrigation
Laser land levelling
Micro catchments
On farm tile drainage for water logging and salination
Drainage water storage and secondary treatment
Leaky Dam for Water Storage
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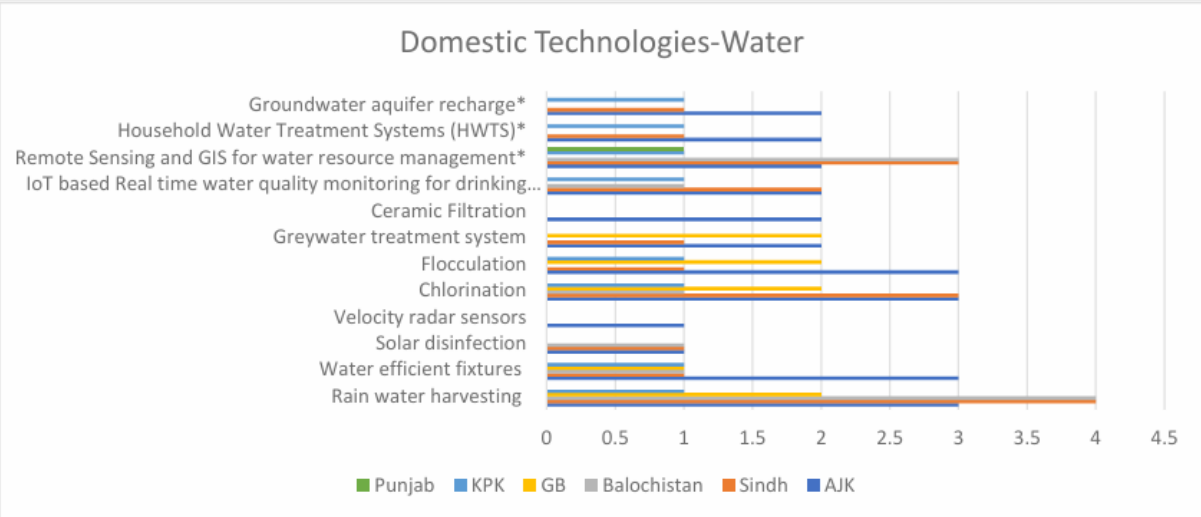
3.5
Punjab
KPK
GB
Balochistan
Sindh
AJK


Domestic Technologies-Water
Groundwater aquifer recharge*
Household Water Treatment Systems (HWTS)*
Remote Sensing and GIS for water resource management*
IoT based Real time water quality monitoring for drinking...
Ceramic Filtration
Greywater treatment system
Flocculation
Chlorination
Velocity radar sensors
Solar disinfection
Water efficient fixtures
Rain water harvesting
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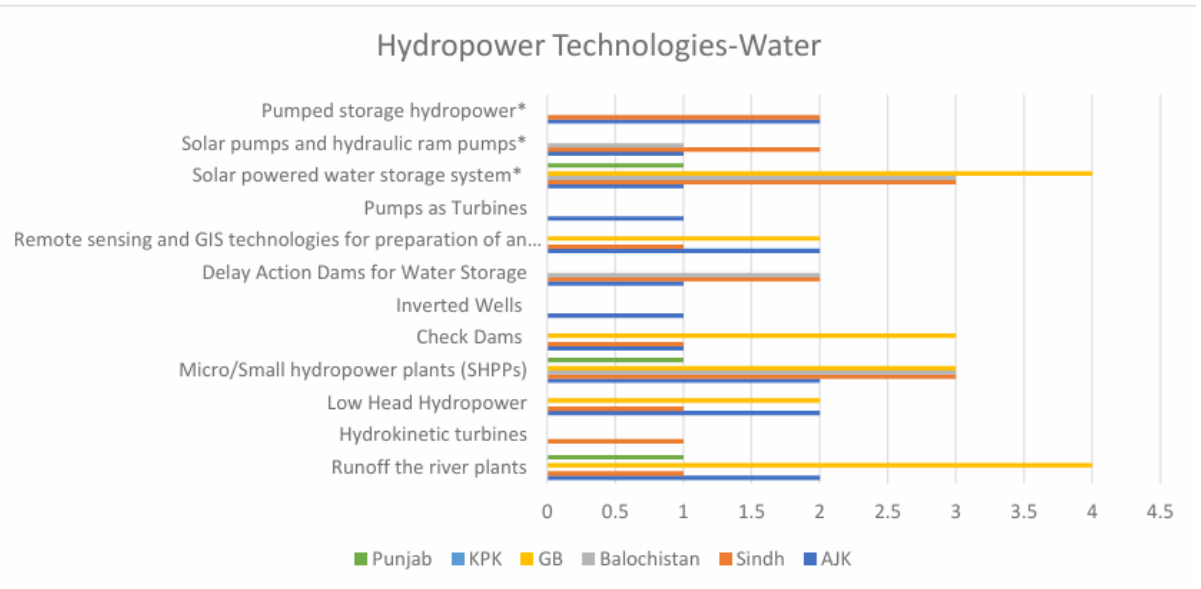
4.5
Punjab
KPK
GB
Balochistan
Sindh
AJK


Hydropower Technologies-Water
Pumped storage hydropower*
Solar pumps and hydraulic ram pumps*
Solar powered water storage system*
Pumps as Turbines
Remote sensing and GIS technologies for preparation of an...
Delay Action Dams for Water Storage
Inverted Wells
Check Dams
Micro/Small hydropower plants (SHPPs)
Low Head Hydropower
Hydrokinetic turbines
Runoff the river plants
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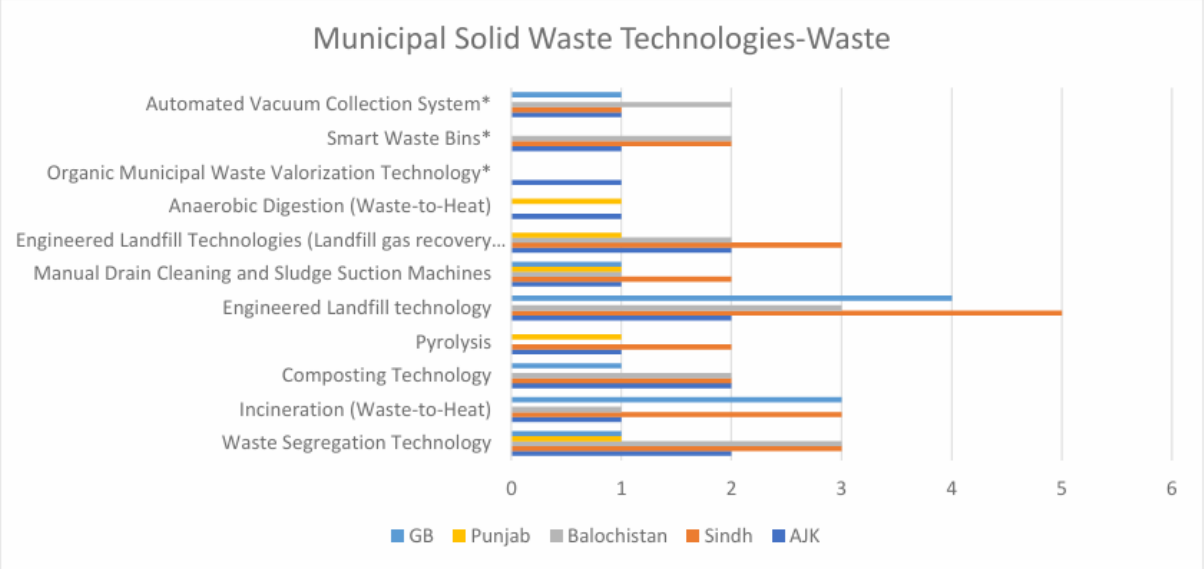
Punjab
KPK
GB
Balochistan
Sindh
AJK


Municipal Solid Waste Technologies-Waste
Automated Vacuum Collection System*
Smart Waste Bins*
Organic Municipal Waste Valorization Technology*
Anaerobic Digestion (Waste-to-Heat)
Engineered Landfill Technologies (Landfill gas recovery...
Manual Drain Cleaning and Sludge Suction Machines
Engineered Landfill technology
Pyrolysis
Composting Technology
Incineration (Waste-to-Heat)
Waste Segregation Technology
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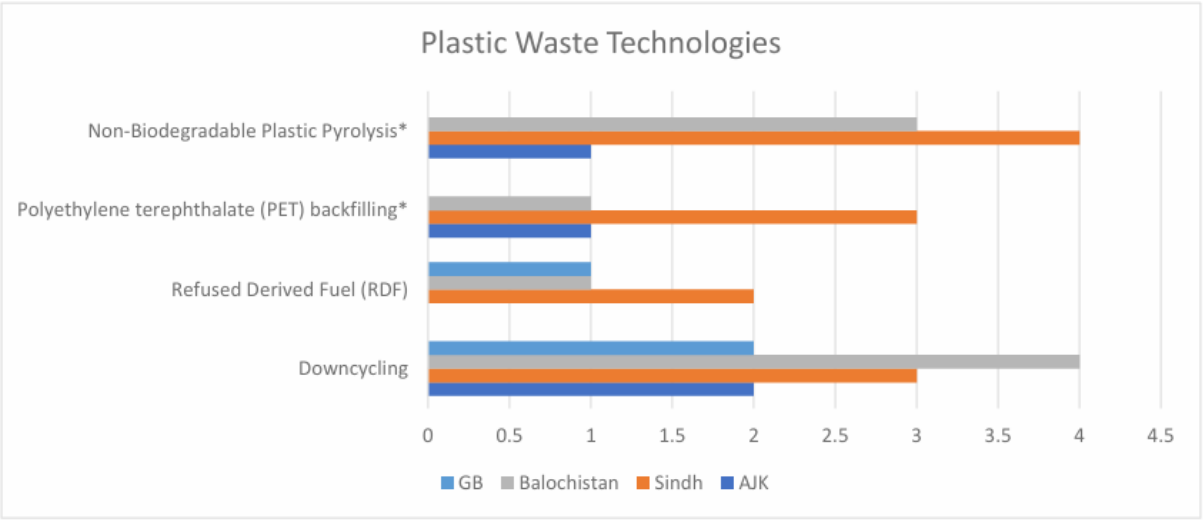
Punjab
Balochistan
Sindh
AJK


Plastic Waste Technologies
Non-Biodegradable Plastic Pyrolysis*
Polyethylene terephthalate (PET) backfilling*
Refused Derived Fuel (RDF)
Downcycling
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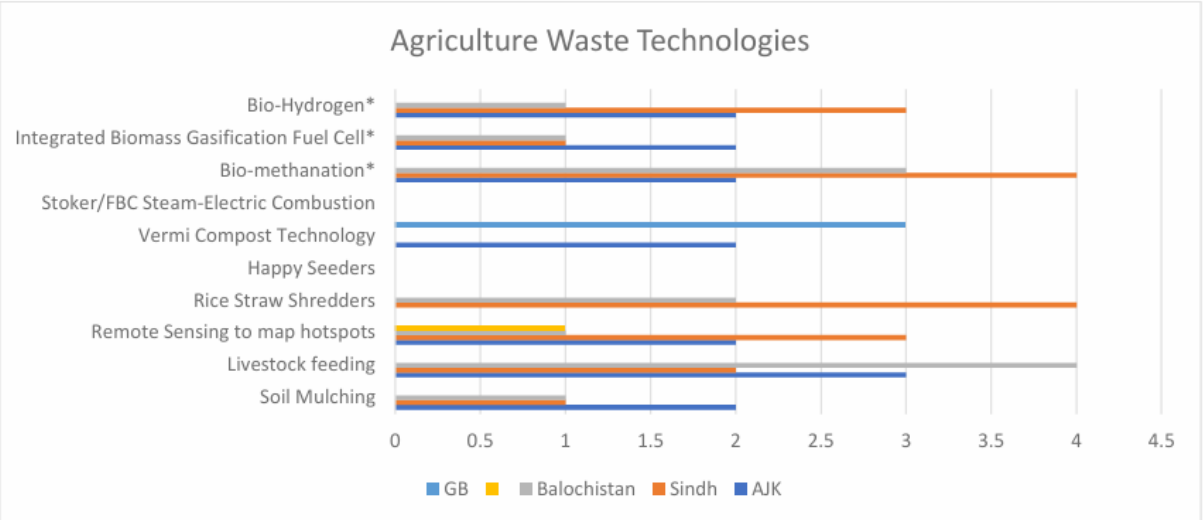
4.5
GB
Balochistan
Sindh
AJK


Agriculture Waste Technologies
Bio-Hydrogen*
Integrated Biomass Gasification Fuel Cell*
Bio-methanation*
Stoker/FBC Steam-Electric Combustion
Vermi Compost Technology
Happy Seeders
Rice Straw Shredders
Remote Sensing to map hotspots
Livestock feeding
Soil Mulching
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3
3.5
4
4.5
GB
Balochistan
Sindh
AJK

3.3. NDCs

In **Azad Jammu and Kashmir (AJK**), respondents demonstrated varying degrees of involvement in formulating the NDC Implementation Plan, with some actively participating in its development. Priority was placed on runoff river projects within the water sub-sector, emphasizing their potential for clean energy generation and climate resilience. Furthermore, initiatives targeting agriculture and waste management were highlighted, indicating a comprehensive approach to addressing environmental challenges. Recommendations underscored the importance of integrated strategies, equitable distribution of resources, and evidence-based decision-making to ensure sustainable outcomes. Conversely, **Balochistan**'s lack of input suggests a potential gap in engagement or awareness regarding NDC formulation and water/waste sub-sector prioritization.

In **Sindh**, while participation in NDC formulation was confirmed, additional insights were provided regarding climate change policy implementation, showcasing ongoing efforts to address environmental concerns. However, a deeper understanding of the specific priorities within the water and waste domains and insights gleaned from the formulation process could further enrich strategies for sustainable development in these regions. For **Gilgit Baltistan and Punjab**, a deeper gap in the participation process was accessed as the majority of responders lacked inclusion and participatory roles in the formulation of NDCs and were unaware of the recent prioritizations and alignments.

In **KPK**, it was revealed that none of the respondents were directly involved in formulating the province's NDC Implementation Plan. However, insights were shared into prioritized sub-sectors from the formulation process, emphasizing the significance of wastewater treatment plants, water conservation measures, and rainwater harvesting. Additional reflections from one respondent highlighted the need for increased resource allocation within the water and waste sectors, as well as the identification of innovative technological solutions and best practices. These insights underscored a broader regional focus on sustainability and resource management within the water and waste domains, despite limited direct involvement in NDC formulation.

4. Conclusion

In conclusion, the NDC Technology Roadmap for Water and Waste Sectors in Pakistan underscores the critical role of technology in addressing climate challenges and advancing sustainable development. Through stakeholder sensitization sessions organized by Green Growth Consultants (GGC) and the Global Green Growth Institute (GGGI), key provinces and regions have been engaged in a collaborative process to prioritize interventions and identify bankable projects. Across provinces like Azad Jammu and Kashmir, Gilgit Baltistan, Balochistan, Sindh, KPK, and Punjab, a diverse range of technologies have been highlighted, ranging from drip irrigation and solar-powered systems to waste segregation and landfill gas recovery. These initiatives not only aim to improve water resource management, waste disposal, and renewable energy generation but also emphasize on the importance of stakeholder empowerment, ownership, and inclusive action. However, challenges such as financial constraints, limited technical capacity, and barriers to implementation persist, underscoring the need for robust funding mechanisms, targeted capacity-building initiatives, and strategic planning. Moving forward, concerted efforts to overcome these obstacles and leverage the potential of technology will be essential for achieving climate resilience, low-carbon development, and sustainable growth in Pakistan's water and waste sectors.

ANNEX-I PARTICIPANTS LIST

Sr. No	Name	Gender	Sector	Institution & Designation	Province
1	Muhammad Uzair Naqvi	M	Government	Environmental Geologist, AJK Power Development Organization	AJK
2	Imran Mukhtar	M	Government	Executive Engineer, PHED Muzaffarabad	AJK
3	Waqas Abdullah	M	Government	Assistant Director Agriculture Extension, Agriculture Dept AJK	AJK
4	Dr. Saradar Muhammad Rafique Khan	M	Government	Deputy Director (Climate Change), Environmental Protection Agency, AJK	AJK
5	Dr. Muhammad Nasir	M	Government	Deputy Director, Irrigation & Small Dams Department, Govt. of AJ&K	AJK
6	Baber Minhas	M	Government	Deputy Director, LG & RD	AJK
7	Abdul Wali	M	Government	Environmental Protection Agency, Balochistan	Balochistan
8	Abdul Haque Zehri	M	Government	Superintendent Engineer, LGRD	Balochistan
9	Abdul Qadeer Kakar	M	Government	Additional Secretary, PHED	Balochistan
10	Zuhaib Ayub	M	Government	Manager WMC, LG&RD	Gilgit Baltistan
11	Engr Muhammad Safdar	M	Government	DD, PHE & Building division Sakardu	Gilgit Baltistan
12	Engr. Tehzeeb Safdar	M	Government	D. Director, Water and Power Department Gilgit	Gilgit Baltistan
13	Ajaz Ali	M	Government	AD, Gilgit Baltistan EPA	Gilgit Baltistan
14	Fatima Bano	F	Government	Research Officer, PCRWR GB regional office	Gilgit Baltistan

15	Suhaib Malik	M	Government	Environment and Social Management Plan/Safeguard Expert, Gilgit Baltistan EPA	Gilgit Baltistan
16	Fakhra Muneeb	F	Government	Technical Expert Climate Change, Gilgit Baltistan EPA	Gilgit Baltistan
17	Mumtaz Ali	M	Government	Deputy Director, EPA Khyber Pakhtunkhwa	KPK
18	Engr Mudassar Zeb Khan	M	Government	Manager Planning, KPEZDMC	KPK
19	Engr Ubaidullah	M	Government	Research officer of Chief engineer South, PHED	KPK
20	Dr Kamran	M	Government	GM Planning a& Project, LWMC	Punjab
21	Sameena	F	Government	Section Officer, Water and Sanitation Lahore	Punjab
22	Anjum Riaz	M	Government	DD, EPA Punjab	Punjab
23	Muhammad Bakhsh	M	Government	Director, PHED	Sindh
24	Waqas Hussain	M	Government	Director, SEPA	Sindh
25	Matee-ur-rasool	M	Government	AD, Directorate of Climate Change Cell, Sindh	Sindh
26	Mehfooz Kazi	M	Government	Energy Expert, Department of Energy	Sindh
27	Dr Asghar Ali	M	Government	Deputy Director, Irrigation Department Sindh	Sindh
28	Zubair	M	Government	Technical Expert, Industries and Commerce Sindh	Sindh
29	Fazal Hingro	M	Government	Section Officer, Industries and Commerce Sindh	Sindh

ANNEX-II Project list

Province/Region	Project
AJK	**Hydropower Projects** 1. 35 MW Nagdar Hydropower Project 2. 40 MW Dowarian Hydropower Project 3. 30 MW Sharda-II Hydropower Project 4. 5 MW Batdara Hydropower Project 5. 4.8 MW BHERI Hydropower Project 6. 3.3 MW Riali-I Hydropower Project **Water Supply and Sewerage Projects** 1. Greater Water Supply Scheme Doba Hotrari Phase II 2. Construction of Sewerage System at Muzaffarabad Phase II 3. Rehabilitation of Tagara Makri Water Supply Scheme Muzaffarabad 4. Construction of Sewage Treatment Plants Muzaffarabad 5. Rehabilitation of older unit of existing water treatment plant Makri Muzaffarabad 6. Solarization of tube wells for irrigation under "National Program for enhancing command area in Barani area of Pakistan (AJK component) **Other Infrastructure Projects** 1. Construction of 34 Small/Mini Dams in AJK 2. Rehabilitation of Water channel Hajira to Tata Pani District Rawalakot 3. Construction of 95 Km Irrigation channel "Jari to Iftikharabad" Distt. Bhimber 4. Rehabilitation of Damaged flood protection structure to protect stadium and allied area District Bagh 5. Rehabilitation of damaged flood protection structures of Nullah Mahl and Bani Pasari District

	Bagh 6. Rehabilitation of Damaged flood protection structure at Majhoi, Lawasi, and Dhani Sayidan left bank of River Jhelum Valley 7. Rehabilitation of Damaged flood protection structure at Hattian Bala & Baghsar Jhelum Valley 8. Rehabilitation of Irrigation Channel JAHALA PANI to Pari Bahak and Kakhian Kel District Neelum, AJK 9. Rehabilitation of Damaged flood protection structure in different areas of AJ&K
Sindh	1. Housewater for kitchen gardening 2. Wastewater for horticulture 3. Waste to Energy Dumping Sites in Karachi 3. S3 Sewage treatment project in Pipeline Sindh Water Sector Improvement by SIDA 5. S4 project of the World Bank 6. Hydropower Project in Guddu 7. Plastic Recycling
Balochistan	1. Waste Segregation at Small Catchment with UNHCR 2. Rainwater Harvesting by Urban Flooding 3. Water Recycling in Car Wash Station UNDP 4. Water Recycling for Agriculture Plant in Quetta
Gilgit Baltistan	1. Construction of lift water supply from boring with solarization at Skardu 2. Lifting of drinking water from the River Indus from Hussainabad to Hoto 3. Mainstreaming, Acceleration, and Policy Support (MAPS) Project 4. Climate-Smart and Energy-Efficient Water Resources Development 5. Safe Drinking Water and Sanitation Project 6. Sanitary landfill site at Chilmish Das, Gilgit 7. Phasing out single-use plastic bag in Gilgit City

	8. Run of River Hydropower Plants in Hunza, Nagar 9. Establishment of Return Back System for PET Bottles 10. Big Scale projects: 11. 26MW Hydropower project Shagarthang 12. 20 MW Hydropower project Hanzel Gilgit 13. 30 MW Hydropower project Gwari 14. 55 MW hydropower project Attabad 15. 100 MW Hydropower project Near KIU Gilgit 16. 80 MW Hydropower project Phander 17. 10 MW Hydropower project Turmik 18. 15 MW Hydropower project Golodass 19. 15 MW Hydropower project Sakarkoi 20. 10 MW Hydropower project Tangir 21. 1.3 MW Hydropower project Gudai Astore 22. 05 MW Hydropower project Sonikot Gilgit 23. 1.3 MW Hydropower project Thoi 24. 2 MW Hydropower project Hassanabad Hunza 25. 0.5MW Chamogarh hydropower project 26. 3.5MW Hydropower project Hamaran Bagorote 27. 03 MW Hydropower project Batot Nomal 03 MW Hydropower project Cane Kargah
KPK	1. Wastewater Treatment Plant for Peshawar City 2. 3. Marble Slurry Management Establishment of Combine Effluent 4. Treatment Plant at Hattar Establishment of Combine Effluent Treatment 5. Plant at Peshawar 6. Temergara Gravity Water Supply Scheme. Mega Water Supply Scheme Tank under Construction/rehabilitation of Water Supply and Sanitation schemes in the southern district of KP. 7. Project of Solarization of Existing/New Water Supply Schemes Under this project 2000 schemes were solarized, and the remaining are

	in the pipeline and proposed but the barrier is the financial constraint. 8. Abbottabad Greater Water Supply Scheme. 9. Gravity Water Supply Schemes Warai Dir Upper.