Sindh Water Policy
Executive Version

Draft
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Abbreviations and Local Terms

Abiana	Service charge for surface irrigation water
AWB	Area Water Board
BMU	Barrage Management Unit
EPA	Environmental Protection Agency
ICT	Information and communications technology
IWRD	Irrigation and Water Resources Department
IWRM	Integrated water resources management
KWSB	Karachi Water and Sewerage Board
LBOD	Left Bank Outfall Drain
RBOD	Right Bank Outfall Drain
SCARP	Salinity Control and Reclamation Project
SIDA	Sindh Irrigation and Drainage Authority
SWP	Sindh Water Policy
WASA	Water and Sanitation Authority
WASH	Water, sanitation, and hygiene
WRMU	Water Resources management Unit
WUO	Water Users Organization

1. Background

This is the executive version of the Sindh Water Policy (SWP), developed on basis of extensive preparation and consultation, leading to a full main version of the Sindh Water Policy. The process of Sindh Water Policy Formulation was approved by the Chief Minister of Sindh. A Steering Committee was notified on 5 September 2019 (NO:SO (C-IV) SGA&CD/4-8/16) for overall supervision and decision making. An Interdepartmental Technical Committee was established by the Steering Committee (14 July 2020) to provide contributions across all sectors. The Steering Committee on the same occasion also approved the Drafting Group for formulating the document based on consultation.

In addition, a working group of practitioner-experts was established by the Technical Committee, providing further inputs. Within the constraints of COVID19 related restrictions six main consultations were organized for detailed discussions on specific issues. The policy formulation also made use of the preparatory work undertaken in 2017 and 2018 by SIDA. Moreover, in the preparation of the policy eight background papers were commissioned on various issues and all scientific articles and MSc and PhD theses related to water management in Sindh, that were published in the last ten years, were reviewed. The draft versions of the Policy have been reviewed by the Interdepartmental Technical Committee before submission and approval by the Steering Committee.

This executive version summarizes the key points of the Sindh Water Policy that came out of these preparations. It subsequently discusses the vision of the Sindh Water Policy and the burning issues to be addressed (section 2), the institutional framework that will underpin the policy (section 3), the improved planning and action required (section 4), the improving service delivery and financing (section 5), the investment priorities (section 6), capacity building (section 7) and the way forward (section 8).

2. Vision, Mission and Objective

The vision of SWP is to secure inclusive development and management of water resources in Sindh that foster the well-being of its citizens, society, and economy. The mission of SWP is to secure integrated water resources management through enabling institutional arrangements and effective actions based on the principles of accountability, decentralization, participation, resilience, and transparency.

The objective of SWP is to set the policy directions and action plans for the active water management systems, that secure long term safe usage of water resources through enabling institutional arrangements. This will make a major contribution to secure an inclusive development of Sindh's society and economy, in which the well-being of its citizens is not jeopardized by deficient water services. The SWP, in particular, addresses six major issues.

1. Managing water resources

There has so far been not enough attention to managing water resources in an effective and integrated way: the emphasis has been on service delivery, often in siloed sectoral manner. The challenge of increasing water demands and climate change – added to a legacy of past problems – requires that water resource management is placed center stage and enabled by the right institutional set-up and attention to planning.

2. Multifunctional, adequate, and integrated management of the canal and drainage system

The canal and drainage system is the lifeline of Sindh province. Its importance cannot be overstated. The significance goes beyond agriculture, but canal water supplies are equally important for municipalities, rural settlements, construction, and industries. The management of the canal system has however been lacking. The widespread persistent waterlogging and salinity are testimony to this, but the province is also facing the deteriorating quality of the canal water, the unreliable supplies at tail end sections, the completely outdated system of water allocation and the inadequate ability to handle flood situations. The canal and drainage system is a major asset to the province and its proper upkeep and secure finance are a prime responsibility to ensure many vital functions. This needs a serious overhaul. This needs to be combined by systematically introducing a new type of agriculture, that uses less water, yet is highly productive and where required is tolerant to inevitable saline conditions.

3. Serving those off grid – water management in the drylands

The drylands of Sindh cover the largest part of the province. These are areas which are sometimes forgotten, despite their relatively vulnerable but growing population. Their water resources need to be secured – for the benefit of the dryland communities but also since these are the watersheds surrounding Sindh's main water system.

4. Wetlands and the Indus Delta as buffers and resource pools

Sindh is well endowed with wetlands. Though placed in an arid climate region, it is home to more than hundred wetlands of huge variety. They are part of the environmental wealth of Sindh and help to buffer floods, recharge groundwater and secure water supplies in times of shortage. Many of them are unique in terms of biodiversity but also produce rich supplies of fish and other products. At the same time there are severe threats to these wetlands, first of foremost to the Indus Delta: degradation by reduced inflows, changed hydrology, encroachment, quality deterioration and behind all this the lack of management, planning and even basic attention.

5. Urban water supply and sanitation: creating safe places for living and working

Just over fifty percent of the population of Sindh lives in cities and towns, a figure that is set to increase. It is hence of paramount importance to create safe places for people to live in and for business to flourish. Yet in urban areas water supply coverage is low, delivery is intermittent and the quality of water in more than 80% of the cases is below standard. A second issue is that there is no urban water management. This showed off recently in the rampant flooding of urban areas in Sindh – combination of high rainfall and ill-equipped urban infrastructure.

6. Rural water, sanitation, and hygiene (WASH) – dealing with hard-core non-access

There is a huge backlog in rural water services. On several key performance indicators, the score in Sindh is shockingly low: actual coverage, functionality of existing rural water supply system and drinking water quality are among the lowest globally. The specific conditions of the province – the extensive area with non-potable saline groundwater and the scarce water resources in the drylands – make access to safe water highly challenging. This requires good management of rural water resources and high institutional performance, that have so far been lacking.

The Sindh Water Policy has been prepared to guide the actions to resolve these six most major issues.

3. Institutional and Legal Framework

The need to manage water resources actively and in integrated manner in Sindh Province and the multifunctional operation of the canal system (including the drainage infrastructure) necessitates a

right setting of the institutional framework for water in Sindh. This active and integrated management of water resources should extend to arid zones and to wetlands as well.

There is now a fragmented system in the management of the water system that needs to be unified. What is important is to create a single system covering the entire province, whereby roles and responsibilities for policy making, policy implementation, operational management and regulation in water management are distinguished covering both canal areas as well as drylands and wetlands in Sindh.

Institutional right setting is proposed as part of the preparation of this policy. The change is toward more integration: considering all uses of water and all resources (surface and groundwater) at each level, both in quantity and quality; towards more accountability, with each function to be devolved to one responsible entity, with clear rights, mandate and reporting lines; towards more decentralization: applying the subsidiary principle, devolving decision power to the lowest relevant level; towards more participation: ensure sensitization, consultation and participation in decision-making at each level and towards more effectiveness, the operational ability to address inequity, environmental degradation and low productivity.

The revised institutional setup consists of:

1. Establishment of a Sindh Water Commission, as a permanent commission with an independent legal personality. The Sindh Water Commission will cause specific water strategies to be developed and review implementation performance, oversee the legislative framework development and assess enforcement, set water body quality objectives and effluent discharge standards, decide rules and incentives for pollution control / treatment, oversee the water auditing for Sindh Province and decide on the water allocation within the province. The Sindh Water Commission will oversee and negotiate interdepartmental issues. The Sindh Water Commission will also address interprovincial transboundary issues and will lead – with support of the Irrigation and Water Resources Department (IWRD) - the discussion with other provinces on water releases, water quality and drainage, flood, and drought management. The Sindh Water Commission will be instrumental in reporting and raising these issues with IRSA and the concerned leadership in other provinces.

2. Transform the Irrigation Department into Irrigation and Water Resources Department (IWRD): The purpose is to broaden the mandate of the Irrigation Department to include both irrigation and water resources management. With change in objectives to IWRD, the scope and jurisdiction will be widened to cover all water resources and diversified usage. This will include ensuring a professional irrigation and drainage service and rationalizing the Department's size over time, and as well as creating water resource management functions and expertise within the IWRD. The Sindh Irrigation and Water Resources Department will include:

    - Water Resources Management Unit (WRMU) that would serve as the secretariat of the Sindh Water Commission and that would set service standards and establish a water resource monitoring system and audit and track the performance of the water system.
    - Oversight and Support Unit – ensuring the required financial and human resources for the AWBs to function properly, making use of the current staff and budgets, and working towards making these more effective and tailored to the needs of the AWBs.
    - Sindh Irrigation and Drainage Authority (SIDA) to become the facilitating agency to implement the massive transformation of the Area Water Boards and Water User Organizations.

- Barrage Management Unit (BMU) to ensure adequate operation and maintenance of the three barrages and delivering water to Area Water Boards in accordance with agreed optimized allocation and maintaining adequate environmental flows downstream to the Indus Delta.
- Special units, dealing with the operation off important vital parts of the system – such as the Left Bank Outfall Drain (LBOD) or the Right Bank Outfall Drain (RBOD).

As part of the institutional right setting and the creation of a Sindh Irrigation and Water Resource Department, the position of Wetland Commissioner will be created, who will coordinate the management and rehabilitation of the wetlands and cause wetland plans to be developed and implemented. The Wetland Commissioner will coordinate for the preservation, rehabilitation, and safe use of wetlands with other sections of the Sindh Irrigation and Water Resources Management Department as well as Sindh Wildlife Department, Sindh Fisheries Department, Sindh Environmental Protection Agency (EPA), Sindh Coastal Development Authority, Karachi Water and Sewerage Board (KWSB), Sindh Culture and Tourism Department and District Administrations.

3. Converting all existing Irrigation Circles into Area Water Boards (AWBs), to be empowered in a stepwise approach and strengthened, to ensure effective Operational Management with focus on sustainable water resources management for all users in their area of jurisdiction.). The Area Water Board in the canal and drainage areas will be responsible for the delivery of water to distributaries and minor outlets as per annually set schedule ensuring equity, based on a compilation of demands of WUOs balancing supply and demand; ensuring water resources are available in a secure and safe way to all water consumers including towns and rural settlements, fisheries, and others. To ensure adequate attention to areas outside the Indus Basin, dedicated Area Water Boards for the dryland areas of Sindh would be established: one for Kohistan and one for the Nara and Thar desert area. In addition, a special AWB will be created for the Indus Delta.

4. Creation of Water Users' Organizations (WUOs), comprising of Farmer Organizations and Water Course Associations and where appropriate wetland management groups to ensure operational management with a focus on service delivery and representing all users. They will ensure the proper water distribution, maintenance and servicing of the infrastructure entrusted to them and will monitor the overall performance of the canal and drainage system. The management of the drainage system is a special concern.

The changes in the institutional framework will be matched by changes in the legal framework. A new unified Law will replace the existing legal documents, in particular the Canal and Drainage Act and the Sindh Water Management Ordinance. The scope of the new unified Sindh Water Law is to create the basis to manage water resources and ensure effective water management in the canal and drainage system, in the wetlands and the Delta, in the drylands and in support of all water functions, including the supply of water of adequate quantity and good quality for urban and rural consumers. A priority area is the management of groundwater to control over-extraction and regulate conjunctive management. This new Law will create the formal basis for the new institutions in integrated water resource management, as described above.

An additional action in strengthening the legal framework concerns the land and water tenure in the drylands. The long-term rights of people in access to run off, flood water and grazing grounds will be secured in the Record of Revenue Rights, something not yet done in Sindh in contrast to other provinces in Pakistan. Entitlements of all lakes, small dams, spate irrigation systems, and catchment

areas should be registered in these records, as this concerns the lifeline of the people in the drylands and sets the basis for improved water resource management.

4. Improved Planning and Action

At the provincial level, water sector development and management should be guided by a Sindh Strategic Water Plan that would be updated every five years and integrate subsector performance targets and priority investments needs towards meeting the objectives of this policy. This Strategic Water Plan would be prepared and accompanied by related complementary plans, in particular a Sindh Flood Risk Management Plan and a Sindh Drought Risk Management Plan.

The Sindh Strategic Water Plan should inform the operation and use of water resources and the water allocation in the different canal commands of Sindh and the Indus Delta as well as in the dryland areas, i.e., Kohistan and Thar desert. This plan will be composed of the multi-functional water plans developed for every different area. The plans will address priority concerns such as water productivity, waterlogging and salinity, water quality, safe sourcing of urban and rural water supply, effluent control, groundwater management and flood and drought management.

As rural water supplies in saline areas often depend on small fresh groundwater lenses that are recharged by the freshwater seepage from canals, this needs special attention in the water plans as the freshwater pockets need to be preserved as such.

In the improved multi-functional management of the canal and drainage system better flood management should be factored in. A hydro-agro information center needs to be created within the operational and academic environment of Sindh with independent capacity to provide services. The information service unit will be the convergence point on water information and will feed the water management plans that are made at province and at Area Water Board levels. Water testing facility at each barrage should be provided to check water contamination level.

There is an urgent need to improve water allocation within the canal system and reassess the water duties for the different canal commands. Even after the commissioning of the Tarbela and Mangla Dam the water allocations in Sindh were not updated. There is also need of optimizing water supplies, promoting conjunctive management of surface and groundwater and systematic reuse of drainage water where water quality allows, enforcing discipline in water deliveries and reducing the cultivation of high delta crops. Water can be saved that will be used to restore environmental flows in the Indus system and to serve tail areas. In a revamped water allocation crop-specific conditions can be considered such as water-saving irrigation for oilseeds or bans of highly water demanding crops. A second task is to bring the cropping pattern in line with water availability for the entire designated command area and the respective agro-ecological zones, as being redefined. This will require the reduction of the cultivation of high-water demand crops in Sindh, particularly sugarcane and rice, and the promotion of productive bio-saline land and water use.

In dryland areas there is a need to come to a uniform land and water management approach that connect local watershed and rangeland groups to the working of government and the support of civil society and other parties. The watershed area of each stream in dryland Sindh Kohistan and Thar desert needs to be demarcated with better understanding of the hydrology and watershed plans. These should serve different objectives: effective groundwater recharge and moisture conservation, improved land management including the rangelands; productive and sustainable use of water with special emphasis on groundwater and reducing flood damage. The harnessing of water for drinking water and stock water is of paramount importance. Large parts of the drylands are in use as

rangelands. These can be made more productive and at the same time can also be better used to retain run off and capture rainwater. There are many measures – controlled and sequenced grazing, revegetation and landscape-based water harvesting. Also, road infrastructure may be used to capture water – to guide run-off to areas where it can be productively used.

For the main wetlands in Sindh – with the Indus Delta being paramount – wetland plans need to be developed to optimize the multiple use of the wetlands, based on the current situation. The wetland plans will have a binding status and will be endorsed by the Sindh Wetland Commissioner. The plans will investigate and determine the boundaries/demarcation line of all wetlands (including lakes), define all functions and socio-economic groups dependent on these, the optimized multiple use of the wetland functions, the quantity/volume of water required and its preferred bandwidth of water quality and the source of this, the different activities to be undertaken and the access and closure to the wetlands. Where water quality is discussed, besides emission limits, waterbody-specific water quality standards should be introduced for different criteria (pollutants and use specific).

For major cities, water resource plans need to be developed for each city or town as well as slum areas. These plans should ensure long-term sourcing of waters, keeping in mind the current service level gaps that are to be narrowed and closed as well as the anticipated development of the towns. They should include strategies for ensuring water quality, in particular zero tolerance on dumping of untreated sewage and wastewater. The sewage and wastewater of all cities should be treated so as to be available for reuse. The urban water resource plans should also create urban environment free from the risk of flooding or waterlogging by integrating urban planning and urban infrastructure development with water resource management.

5. Improving Operation, Water Service Delivery and Financing

In the operation of the water system in Sindh a top priority is to promote improved water use in agriculture and bring it in line with agro-ecological zoning and water entitlements. There is much economic scope for different cropping systems, especially when the system of input pricing and subsidies is rationalized. There are also many methods to be more precise in farming and save water, labour and farm inputs whilst obtaining higher yields. There is a gamut of smart water techniques that should become common practice: alternative wetting and drying, better water scheduling, applying better inputs and the use of soil improving agents, the use of micro-irrigation systems or greenhouses, small local drainage, and others. The transition to a water efficient economy needs to be supported by a reorientation in the pricing and subsidy arrangements around agriculture. Many high-water demand crops are stimulated under a range of public support measures, be it guaranteed procurement prices or intervention prices, export subsidies, cash freight support, fertilizer subsidies, subsidies on farm machinery or outdated water taxes. The cultivation of the high-water demand crops is also stimulated by reducing market risk from procurement systems and import levies or the support from agricultural research for new varieties of these high-water demand crops. As has been decided in the Sindh Agricultural Policy such high-water demand crops should be replaced with other crops and the public incentive system should be fairly implemented and support crops that are in line with Sindh's revised agro-ecological zones. This requires an overhaul of the financial and other agriculture support arrangements and in some area's outright bans.

What applies to the canal irrigated areas is equally valid for the drylands. Yields in the dryland spate irrigation in Sindh are less than half of what they are in comparable systems elsewhere. This can be achieved by better field water management (better water distribution, better bunds, and better moisture storage) and better varieties.

There is also a need to promote agriculture and fisheries that is in line with widespread salinity in Sindh Province. Apart from special bio-saline plants, many common crops have varieties that are unexpectedly salt tolerant, in particular if combined with good agronomic practices. Closely related to this is the promotion of aquaculture, that is far less widespread in Sindh than it could be.

A special regulatory concern is the control of direct outlets from canals and branch canals and distributaries. Anecdotal evidence suggests that this affects 30% of the water in the canal system. It undermines the capacity to operate the canal system and creates inequality. An immediate all-out ban on new outlets is required and the power to sanction these on whatever reason needs to be withdrawn. For the existing sanctioned outlets tailor-made plan needs to be prepared to see which outlets can be relocated or provided with control structures and which ones not. Non-sanctioned outlets need to be phased out.

The improved operation also needs to be matched by secure financing for the operation and maintenance. The abiana system needs to be vastly simplified based on land and irrigation duties rather than the cumbersome system of crop assessment that is now in place. For collection deposits in local banks is the way forward. The rates need to gradually rise to be at the level of real values of at least what they were thirty years ago. Prices need to reflect the value of water and stimulate demand. This needs to be discussed with farmer representatives, so as to create acceptance. The proceedings moreover need to be retained by the managers of the canal and drainage system – the Area Water Boards and the Water User Organizations, as was introduced in the reforms of 2002, and there should be no administrative constraints for the AWB and WUOs to use their autonomy.

Other possible sources of income from the canal system – from tree planting on canal banks, fishery rights, realistic water pricing for urban water supply, tourism charges or waterfront real estate - all need to come in place to create a healthy and vibrant system. A related activity in financial realignment is the rationalization of expenditures within the main water service provides, in particular getting rid of redundant expenditures. Here a prime target is the phase out the costs of running public SCARP tube-wells, many of which are long out of order.

The improved operations and finance in the irrigation and water resource services should be matched within the urban and rural water supply sector, so that urban water and sanitation utilities including KW&SB, WASA Hyderabad and other local municipal authorities, can deliver better and become stronger players in water resource management. The utilities should undergo the transition to performance-based systems and make use of the full autonomy in operations, finance, and human resource management.

6. Investment Priorities

There is a need to make investment an instrumental part of better water resource management rather than create stand-alone infrastructure only with limited functionality. There is a need to reverse the trends of mis-investments of the past, that created additional problems and not resolved earlier ones such as ill-conceived drainage works, unwanted canal lining or oversized storage reservoirs on dryland valleys.

There is much low-hanging fruit, many new types of investments that are possible be it in water saving and better water management, wetland improvement or combining flood management with recharge. As a golden rule investment should always combine better operational practice, organization development and capacity building and physical work in an integrated package. The packages should be based on an assessment of the overall water balance and water quality in the

areas concerned, as is done under the Sindh Water Plan and the detailed plans for the different irrigation and drainage circles, the drylands, and the Indus Delta. This will lead to more cost-effective, functional, and sustainable interventions.

Several generic investment priorities emerge from the Sindh Water Policy:

- In the canal system there is a need to invest in better water management. This entails a lot of investment in developing better practice but supported by physical investments. This can be new head regulators/replace old regulators and flow calibration systems; long crested weirs for better upstream water level control; water course development following closure of direct outlets; installation of high efficiency irrigation systems, reclamation of salt affect soils, small drains, construction of water storage ponds, canal bed sills to regulate canal depth. Much of these investments can be done by or through Water Management Organizations who may identify and design them.

- This is to be complemented by location-specific drainage investments. Developing even upgrading existing drainage works should only be done based on a water balance that also identifies the measures that can be taken to reduce drainage requirements, as in many areas inadequate water management practice is causing the problems. In drainage there is also a need to invest in flood water removal, in particular the unblocking of natural drainage paths.

- There is also much scope for investment in the dryland as part of an integrated catchment approach. This will make productive use of rains and floods to source water systems and to recharge and retain groundwater, using subsurface dams, leaky dams, cascade dams, improved spate irrigation, sand dams, bed raisers and bed stabilizers, infiltration galleries and off-stream storage.

- In addition, there is much scope of the water holding capacity and revegetation of rangelands and watersheds, using what is common practice elsewhere, such as water harvesting, area closure and managed intensive grazing, to restore such areas and help them to conserve water or the entire drylands

- Investments in wetlands are overdue. As part of the drive to rehabilitate Sindh's wetlands, investment plans may be developed for priority wetlands. As part of developing such plans, quantifiable social, environmental, and financial benefits of restoration, protection and conservation of wetlands can be calculated and presented. On this basis combined public and private investment will be sought – to generate the different benefits but also to schedule the regulation, monitoring and assessment, overdue and repair of the restoration and protection and water quality.

- Another priority is closing the backlog in essential urban water infrastructure, including water treatment and domestic and industrial wastewater treatment and the overhaul of urban drainage systems. These investments will have a double impact: they improve the quality of life in the urban areas, but they also reduce the harmful effect of urban wastewater on downstream users.

- A special mission is to tackle the drinking water supply of the many unserved areas, in particular those where self-supply does not adequately cover for the lack of coverage. Outside canal areas, public investment shall be made for rainwater harvesting to augment the range of services.

- Public investment shall be made to get the water closer to houses to address the gender issues, as a lot of women in rural areas spend so much time and do labor work to fetch water from wells.

For canal areas this may consist of water filtration plants, in areas where there is no alternative to safe quality sourcing.

- Finally, investment is required in monitoring, in recording groundwater levels, in measuring canal inflows and in tracing water quality – at the barrages in the Indus and in the main canals and drains. There is plethora of new sensor systems that can be considered.

There are also several larger investments required to improve the overall water system architecture in Sindh. The main policy document has discussed the most important among these, such as the restart of the Right Bank Outfall Drain, which could help to reverse the degradation of Manchhar Lake; the upgrading of the Left Bank Outfall Drain including escapes to relief high surface run-off and use it for groundwater recharge or work to improve the conditions of the Indus Delta. It is beyond the scope of the policy to discuss such individual large projects in detail, but what needs to be emphasized is the need to make all the minor and major physical investments part of a complete integrated water management approach, where the challenge is analyzed and resolved by considering all measures.

7. Capacity Building

Capacity building concerns developing skills and new practice but also creating positions and creating a works culture, with accountability for results. It is noted that many talented persons have graduated in water resources management from educational institutions in Sindh in the last five years, yet they are often not employed in the sector, despite the huge needs as identified in this Policy.

Facilitating the implementation of IWRM principles will require adequate staffing in numbers and skill-mix and increased levels of capacity to manage evolving demands, including in water accounting, and auditing, remote sensing, other modern approaches to water resources management. At present the number of professional staff in the public water sector in Sindh is low compared to other countries and this constrains the ability to manage water resources effectively. In addition, the lower discipline and stagnated skill levels hamper the delivery of services. There is a need not only for more technical staff, but also different capacities and a higher motivation.

A new cadre of qualified and educated operational water managers working on water resource management and protection in both the canal areas and the dryland zones should be created with practical expertise in conjunctive management, the protection of water quality, wetland management, groundwater protection and community engagement. These new capacities should be spread widely – at all levels of the service organizations, in the work of Water Management Organization, local government and civil society. The development of Hydro-Agro Information Center and the Sindh Water Plans create one opportunity to nurture such a new cadre. The responsible institutions shall be strengthened to enhance their capacity to deliver services and manage water resources. This needs to be combined with developing standard operating procedures for providing water services and for source protection.

There is also much scope to better promote private entrepreneurship around the water sector. Virtuous employment for young people is a major theme. There are many new things to do and new opportunities to use. Examples are around sourcing material for water saving agriculture, better wetland utilization, delivering rural water supply services and better rangeland management. This requires that skills – technical and business skills – are widely available, that local entrepreneurship in small and medium enterprises is stimulated and community-private-public models are created.
In addition, for better performance in delivery of WASH services, the existing institutions shall be strengthened to enhance their capacity to deliver services and manage water resources. The following

policy shall be adopted: develop standard operating procedures for water supply schemes and sanitation services, including source protection; develop standard operating procedures for functionality; annually track performance of rural water supply systems; enhance capacity of human resources and infrastructure for required service delivery; make all schemes functional; develop range of community-private-public models and create local entrepreneurship and business in WASH.

8. Way Forward

From the preparation of the Sindh Water Policy, it became manifest that among the main stakeholders there is uniform understanding that water resources need to be managed actively and in an integrated manner. There is a large sense of urgency that the concerns on water quality and imbalanced water allocations need to be tackled; that the canal, drainage, and water supply system are important provincial assets that need to be managed as such; that widespread water logging, low water productivity, deficient services, degraded wetlands, and neglected watersheds no longer belong to this time. Topics that in the past may have been controversial or that may have had few takers, such as the need for institutional and legal adjustments, are now endorsed across the spectrum of stakeholders and are seen as timely answers to increasing challenges. This means that implementing the Sindh Water Policy is to give shape to shared aspirations of the people of Sindh.

Managing water resources adequately and providing better water services is one way of maturing the economy and society. It is not about protecting water resources as such; it is about creating a higher level of interaction in society where better services are provided and more value is created. As such improved water management brings quality of life, higher happiness, less family insecurity, and lower exposure to avoidable risk. In the process it creates jobs for the educated and the lesser skilled and sets the basis for a stronger economy. Addressing all the major issues in the Sindh Water Policy are within our faculty and can be made possible by dedication and leadership.

Whilst the support for the policy forms a good base, it is also important to manage the next steps adequately. For each policy action, first steps can be identified that can be taken in the next year, to get started on the different necessary areas. These first steps to address each of the six major issues are given in the table below:

1	**Managing water resources**	
1.1	Institutional right setting towards Integrated Water Resources Management	Develop overall new institutional architecture for water sector, including commissioner for Wetlands and Area Water Boards for dryland areas and Indus Delta for approval to Chief Minister
1.2	Legal adjustments in support of Integrated Water Resource Management and fair and equitable water use	Agreement on main directions in redrafting of legal framework and formation of legal drafting team, ensuring unified legislation
1.3	Introduce Water Sector Planning	Develop architecture and process for rolling five-year water sector plan, anchored in new institutional arrangements
1.4	Establish a Hydro-Agro Informatics Center	Agree on scope of activities, induction of new cadre, wide service function and have secure financial model
2	**Multifunctional, adequate, and integrated management of the canal and drainage system**	

2.1	Optimize multifunctional management of the canal system	Prepare first multi-functional water management plan prepared for one Area Water Board with engagement of main stakeholders
2.2	Reassess the water allocations between canal commands	Develop plan for water reallocation between canal commands started
2.3	Improve water productivity and better managed production in saline areas	Extension and research plan for bio-saline agriculture Plan for retailoring all subsidies and regulatory provision that support unsuitable cropping systems Reactivated extension and outreach to agricultural water users with ICT supported programs on how to achieve higher water productivity
2.4	Financial readjustment of water system financing	Develop plan for streamlined abiana and for tapping other sources of revenue from water sector
3	**Serving those off grid – water management in the drylands**	
3.1	Have an institutional home for the integrated development of the dry land areas	Start the process of developing an Area Water Board for dryland areas, starting with Kohistan region
3.2	Come to a uniform watershed intensive approach, whereby a large range of options are used	Work with all stakeholders to come to a coordinated watershed approach, based on international good practice, focusing on priority watersheds Develop plan for provision of drinking water for the dryland parts of Sindh
3.3	Better manage and develop the rangelands by better retaining water and improving fodder practice	Develop with livestock communities plan for improved rangeland management within pilot watershed
3.4	Promote judicious use of water – especially for these areas where water resources are scarce and even drinking water supply is insecure	Develop extension package with communities, Agricultural Department, and private sector for effective water management in spate irrigation, rainfed systems and discuss participatory groundwater management
4	**Wetlands and the Indus Delta as buffers and resource pools**	
4.1	Co-coordinating authority for wetland management	Wetland commissioner position, to become part of the reformed institutional arrangements
4.2	Develop wetland management plans for multiple use	Investigate and determine the boundaries/demarcation line of all main wetlands/lakes that should include quantity/volume of water required, source of fresh water, socio economic situation, integrate allocate and release freshwater for all lakes and wetlands
4.3	Combine these with wetland investment plans with priority for most critical wetlands	Develop/prepare comprehensive strategic and business plan for rehabilitation and management of wetlands with public-private partnership.

4.4	Enhance the capacity to understand and effectively manage wetlands	Develop curricula on wetland management in Sindh's universities
5	**Urban water supply and sanitation: creating safe places for living and working**	
5.1	Water resource planning for cities and towns	Develop action plans to ensure the required water supply and urban water management for Karachi and two other big cities keeping in view in population, population growth and urbanization trend. These urban water resource plans need to be integrated with the Sindh Water Plan
5.2	Better operators: improving operational and environmental performance of urban water service providers	Develop open access system of performance tracking for urban subareas with civil society engagement
5.3	Mobilize public investments for essential defective infrastructure	Preparation for investment in vital water treatment facilities with major downstream effects
5.4	Regulating and stimulating private service suppliers	Meetings with private parties in water services (irrigation equipment, water treatments, reverse osmosis services and water tanking) to discuss SWP and aligning and stimulating private sector role
6	**Rural water, sanitation, and hygiene (WASH) – dealing with hard-core non-access**	
6.1	Provision and protection rural drinking water resources	Mapping freshwater pockets in at Area Water Boards and agree on protection of these rural water resources by improved canal operations (including canal closure), controlled extraction and local drainage improvement
6.2	Reform and strengthen institutions and capacity to deliver services	System for tracking performance of all rural water supply including scan of main challenges in place
6.3	Targeted public investments	Develop plan for provision of drinking water for the dryland parts of Sindh and the most affected areas with saline groundwater as well as for priority rehabilitations.
6.4	Involvement of local private sector in service provision	Market place organized with local private business on opportunities to provide services for rural water supply, household water treatment and sanitation

The implementation of the policy action is not the sole responsibility of a single organization, but the tasks are to be shared by many, often as a joint effort. It is important that the Sindh Water Policy is known to many and becomes a joint framework for actions. For this it is important that the Sindh Water Policy and the opportunities it provides for better public health, more prosperity and less tension are extensively communicated.

At the same time also, water has to become 'everybody's business'. The cost of wasting water must be widely understood and must become a source of common public concern. More insight in the state of water quality in Sindh will be developed by the monitoring of water quality. Wider groups of Sindh's society must understand the risks of low-quality water, inadequate services, and pollution. Furthermore, the functionality of WASH services shall be tracked and reported for ensuring continuous service delivery. Campaigns shall be initiated for wise water use and the provision of safe

water by mobilizing communities and schools that monitor and take the action for improvement. This will create the popular basis for better water management and the pressure for quality services.