



Ministry of Climate Change and Environmental Coordination

HIGH LEVEL ESTIMATE OF COST OF IMPLEMENTING PAKISTAN'S NATIONAL ADAPTATION PLAN

National Adaptation Plan for Pakistan



WATER



AGRICULTURE



URBAN



ECOSYSTEMS

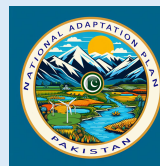


FINANCIAL

“Adapting Today for Sustainable Tomorrow”

2nd December 2022

Lead Consultant: Kenneth Andrasko
President, AltaVerde Consulting
Consultant under contract to IISD
Washington, DC area, USA



This report was commissioned by the GCF PAK-RS-003 Project “Building capacity to advance National Adaptation Plan Process in Pakistan” which aims to support the Federal Ministry of Climate Change and Environmental Coordination (MOCC&EC) and its partners at Federal and Province levels to implement the National Adaptation Plan (2023). The Delivery Partner is the United Nations Environment Programme (UNEP).

Disclaimer: The views, thoughts, and opinions expressed in this report are solely those of the author(s) and do not necessarily reflect the official policy or position of the Ministry of Climate Change and Environmental Coordination (MoCC&EC), or that of UNEP and GCF.





Final Report

“High-Level Estimate of Cost of Implementing Pakistan’s National Adaptation Plan (NAP)” Consultancy

January 27, 2025

Kenneth Andrasko

President, AltaVerde Consulting
consultant under contract to IISD

Washington, DC area, USA kandrasko3@gmail.com

Executive Summary

The National Adaptation Plan (NAP) was produced by the Ministry of Climate Change and Environmental Cooperation (MCC&EC) in late 2023. The document focused on six priority and two cross-cutting sectors, after introductory reviews of potential climate change climate risks and vulnerabilities, and an overview of the NAP process. However, while the NAP document devotes a few final paragraphs to financing the NAP, it does not include any cost methodology, discussion of how to determine what the cost of the NAP process and actions might be, or estimates of the costs of the 117 NAP actions.

Thus, the current NAP document offers a vision of a national plan -- but one that cannot be funded or implemented without revising the descriptions of what activities would be undertaken in each NAP action, and of what scale is envisioned (i.e., in one province?, in all 166 districts?).

A forecast of the total investment required to address potential climate impacts in Pakistan from 2023 to 2030 in 2021 by the World Bank totaled US\$152 billion for adaptation and resilience actions and economic policies. National economic studies of this type evaluate economy-wide responses (not a set of individual proposed actions like the NAP), usually using Computable General Equilibrium (CGE) models capable of capturing macroeconomic and cross-sectoral effects of climate change impacts.

In contrast to the economy-wide World Bank forecast, the NAP is a set of 117 separate actions that are highly specialized (e.g., adjusting irrigation fees) and would not be captured in economy-wide models. They were proposed via a stakeholder consultation process as potential ways to respond to anticipated adaptation impacts. No previous cost estimate of Pakistan’s NAP has been performed.

The methods selected for this estimation are standard “first-order approximation” methods, using simplifying assumptions to produce a result in a limited time and using the limited relevant cost data available for Pakistan. The consultancy began with a review of the NAP document’s priority actions and the texts describing them revealed that a set of eleven common project activities are implied by the texts of many NAP actions, such as

drafting a feasibility study before commencing a major project, enhancing existing agricultural or forestry extension services, or developing some sort of financial mechanism. Each of these example activities are either explicitly mentioned or more commonly are implied in the short texts of numerous NAP actions. Since the NAP did not specify what activities would occur in any of the 117 actions listed, the lead consultant made a set of assumptions of what activities would occur in each action, and the scale at which they would be implemented -- as pilot actions to demonstrate the viability of the approach, or as fully implemented actions in every administrative district in the country.

About 75 international projects in Pakistan funded and/or implemented by Green Climate Fund, UN agencies, World Bank etc. were discovered and reviewed to find examples the costs of whole projects or of common project elements (e.g., enhancing capacity building, or developing a climate data monitoring system). In addition, a questionnaire was developed and sent to about 60 experts, inquiring about their knowledge of the NAP process, and of any studies or data on the costs of NAP actions. This opened a dialogue with about 10 experts that generated lists of roughly 100 climate or development projects in Pakistan or the region that were reviewed as well. All example project cost data was entered into a new Excel-based Pakistan NAP Costing Tool built to manage the project cost data being collected, and to estimate the costs of NAP actions.

The Pakistan NAP Costing Tool is comprised of seven Excel data entry sheets that guide the input of examples of project costs that are considered analogous to the costs of some NAP action activities. This proxy approach is commonly used in economic modeling to serve as an indirect measure of a desired value, when data are limited. All of the individual NAP actions are listed in order in Sheet 4 of the Tool, along with a set of assumptions made of what activities would take place, at what scale, for each action. The costs of two or more project cost examples that are reasonable proxies for a given action's activities are averaged or summed to scale up to either the pilot scale (about 20 districts) or national scale (all 166 districts) by multiplying by the number of districts that would be involved during implementation. What the Tool terms as Additional Costs that are typical for development projects (like monitoring, assuring social inclusion, or project management), as well as risks and uncertainties, are addressed by adding default values. These costs are expressed as a percentage of the project cost, and are added in Sheet 5 of the Tool. The estimated indicative costs are displayed in the final Sheet 6 by sector and in total, in PKR and in USD.

The results were calculated and are presented using two scenarios. **Scenario 1: Demonstrating Adaptation** is a learning-by-doing scenario that recognizes existing constraints in Pakistan. It assumes the NAP program would start slowly, but rapidly learn lessons in the first period of 2025-2030, then find more abundant funding and expertise to expand in the second period. This is a piloting scenario that assumes all NAP actions are introduced in only about 20 districts (five districts in each of four provinces), due to limited capacity and funding. In addition, about 20 actions already assumed to be national in scale in the Tool would also be implemented (such as a study of modernizing the *abiana* irrigation water-pricing framework in the Agriculture and Water sector; only one study would be required.) The scenario indirectly assumes enough required human and institutional capacity, and enough funding, to implement all actions in 20 districts are found and put in place at the start of the first NAP period in 2025.

The estimated indicative cost of implementing Scenario 1 is a range of 1.1 Trillion PKR to 2.0 Trillion PKR, around a Central Estimate of PKR 1.5 Trillion. This equals about USD 3.9 Billion to 7.3 Billion.

Full results for Scenario 1 are shown in figures 5 and 6 below, and are provided for individual NAP actions (in Sheet 4 in the Tool), and for each sector (In Sheet 6 of the Tool).

Scenario 2: Full National Implementation indirectly assumes that full funding to start all actions in all of Pakistan's 166 districts is available and ready to be deployed in 2025 at the start of the first NAP period, as well as all required human and institutional capacity. The first-order indicative cost of implementing this Scenario 2:

Full National Implementation is a range of 2.6 Trillion PKR to 4.9 Trillion PKR, around a Central Estimate of PKR 3.8 Trillion. This equals about USD 13.7 Billion to USD 17.8 Billion.

The detailed results for Scenario 2 are shown in Figure 7 below. Results also are provided by individual NAP action (in Sheet 4 of the Tool), and for each sector (In Sheet 6).

Stakeholder workshop: The NAP Team and consultants organized a half-day meeting with ~65 attendees to share the activities, early results of the consultancy, and initial lessons, and to seek further cooperation with stakeholders on refining cost estimates of the cost of the NAP. A detailed presentation was given by the international consultant, followed by extensive dialogue. Five breakout groups were formed to discuss one or more of five questions chosen to solicit viewpoints and additional information relevant to the elaboration of the methods and cost estimation.

Discussants noted that several estimates of the broad cost of Pakistan adapting to climate change impacts exist, produced by economy-wide Computable General Equilibrium (CGE) models capable of capturing macroeconomic and cross-sectoral effects of climate change impacts. Participants shared some interest in starting work on costing adaptation in Pakistan, and expressed viewpoints about how such work could commence, and who should be involved.

The international consultant was encouraged to offer observations of the state of adaptation work in Pakistan and recommendations regarding potential next steps. The consultant's views shared included:

Recommendation 1: The roles in the NAP process of the national government and the provincial government actors need to be better clarified.

Recommendation 2: The NAP team and MOCC&EC should undertake a crisp, one- or two-month stocktaking exercise now – before making any major decisions about a) the potential use or enhancement of this Tool and its first-order approximation results; and b) evaluating several options to accelerate the implementation of Pakistan's adaptation priorities that were discussed during the stakeholder meeting in Islamabad on December 10th, 2024, and that are summarized in Table 6 below.

Recommendation 3: The NAP team should review the very large set of assumptions made in the Tool about which activities, at what scale, would comprise each NAP action, and amend any assumptions once better information becomes available about what the NAP drafters intend.

Recommendation 4: Use of a scenario approach to costing the NAP will facilitate the NAP team's ability to reflect the potential likelihood and feasibility of securing the necessary funding and the human capacity to implement the massive set of NAP actions.

Recommendation 5: Finish developing a NAP Financial Strategy that highlights the actions that should be advanced first. A strategy is important for establishing the highest priority actions for technical assistance for proposals and for use of funding that becomes available.

Recommendation 6: Consider developing "Climate Change Adaptation Investment Plans" by sector and/or province, offering finer granularity in cost estimates for high-priority adaptation actions.

Recommendation 7: The NAP team should create a team to provide technical assistance to the most promising proposals for adaptation finance from international and domestic sources. Great proposals win funding!

Recommendation 8: The NAP Program and MOCC&EC should reflect on how to jumpstart the slowly evolving NAP process, by assessing options to do so, and produce an QuickStart Action Plan in the first quarter of 2025.

Recommendation 9: The NAP team and MOCC&EC should consider prioritizing early pilot project implementation of one or more NAP actions. Demonstration actions can be an inexpensive way to learn early lessons and prevent later failures. Pilots have a power far beyond their small scale

Recommendation 10: The NAP team and MOCC&EC should consider developing the business case for private sector engagement and investment in selected NAP actions. Additionally, the ministry may want to identify potential incentives or removal of barriers to investment that could be advanced, which may help entice the private sector play a role in implementing NAP actions with a market component. Privates can play many potential roles (e.g., supply transportation services, financial services, equity stake in new projects in some cases, feasibility studies, etc.)

I. Objective and Activities of the Consultancy

Objective: “The purpose of this assignment is to provide a high-level estimate of the cost of implementing the Pakistan NAP, based on the implementation costs of the 118 sectoral adaptation interventions included in the NAP document,” per the project’s Terms of Reference.

The tasks and activities of this consultancy were led and largely performed by the international consultant, Kenneth Andrasko, of AltaVerde Consulting and based in Washington, DC, with generous support from the national consultant, Mohammad Tanvir Butt, and NAP team members Khurshid Khan and Khan Gulam of UNEP, all based in Islamabad. Mac Keller supported the international consultant in coding and restructuring the new Excel NAP Tool in the US, as a consultant to IISD. Maribel Hernandez of IISD and Humaira Jehanzeb of the NAP Team and UNEP guided the work.

II. Pakistan’s NAP, and Challenges in Costing It

The national adaptation plan or NAP is an ambitious, 122-page document, produced by the Ministry of Climate Change and Environmental Cooperation (MCC&EC) in late 2023. An overview of the six priority sectors the document highlighted is presented in Table 1, including the number of priority interventions -- referred to as “NAP actions” in this report. The nomenclature used in the NAP document for sectors and actions is followed throughout this project. Note: The final NAP document states it is comprised of 118 actions, but only 117 are listed, due to duplicate listing of an action, skipping in the numbering of actions, etc.

Table 1: Summary table of Adaptation interventions as per approved NAP document

Sector Number	Sectors (using NAP’s numbers and nomenclature)	Number of priority interventions
I.	Agriculture-water nexus	16
II.	Natural capital	19
III.	Urban resilience	20
IV.	Human capital: A. Health B. Education	19 (9) (10)
V.	Disaster risk management	25
VI.	Gender, youth, and social inclusion	18
Total		117

Source: consultant’s analysis of the NAP document

A number of challenges are inherent in the structure of the NAP document. . These challenges include:

- The NAP document stresses very technical, specific activities under most NAP actions, but devotes little space to describing cross-cutting activities, how the 100-plus actions might complement or compete with each other, and in descriptions of the NAP actions in each sector of it. These challenges include:
- 117 separate NAP activities are identified -- but not in detail, with their texts usually consisting of a few sentences. Some actions include up to 10 sub-actions within them, without elaboration.
- The NAP document does not include any cost methodology, or discussion or estimates of the total, sectoral, or individual NAP action costs.
- Thus, the current NAP document offers a national plan that is challenging to fund or implement without further elaboration.
- The descriptions of the NAP actions are not explicit regarding what activities would be undertaken in each NAP measure; nor what scale is envisioned: A few districts?, one or more whole provinces?, all provinces and territories in the country?
 - Eg, if an action states solar irrigation will be expanded, then would this occur In every province?, or just 1 or 2? How many solar irrigation pumps would need to be installed per kilometer of the irrigation network?
- **The NAP document is silent about the process envisioned for implementing all these complex, expensive actions.** Hence, every action exists independent from all the others (even though many would be implemented by the same provincial or national agencies, or in the same geographies).
- **Strategies and plans to secure the massive funding required, and to manage the implementation of this complex program, are not proposed.** No more than a few general final paragraphs discuss how this extremely expensive, complex national plan would be funded -- by whom, and over what timeframe? How would implementation of the NAP, perhaps the country's largest and most expensive program ever, be managed?

III. Methods for Costing Adaptation Actions

While several estimates of the cost of Pakistan adapting to climate change impacts exist, they use methods that cannot estimate the cost of the wide range of highly varied NAP actions. For example, a forecast of the total investment required to address potential climate impacts in Pakistan from 2023 to 2030 by the World Bank totaled US\$152 billion for adaptation and resilience actions and economic policies. (An additional US\$196 billion was projected for investments supporting decarbonization of the energy sector). National economic studies evaluate economy-wide responses, usually using Computable General Equilibrium (CGE) models capable of capturing macroeconomic and cross-sectoral effects of climate change impacts.

In contrast, the NAP is a set of 117 separate actions proposed via a stakeholder consultation process as potential ways to respond to anticipated adaptation impacts. The actions identified in five priority sectors are highly specialized (e.g., adjusting irrigation fees) and would not be included in economy-wide models, since they often are far too small in scale and are proposed in sub-sectors not included in such models.

Hence, the methods selected to cost the NAP actions needed to address the limited availability and difficult accessibility of project performance and cost data, at both the provincial and the national levels -- an early barrier in this project. These data are the fundamental building blocks of the selected approach to cost estimation -- around which the Pakistan NAP Costing Tool has been built.

A. Activities performed during the consultancy:

The following two clusters of tasks were performed -- the first cluster to develop a method to cost NAP actions; and the second to implement that approach in the Pakistan NAP Costing Tool, built for this purpose.

Task cluster 1. An appropriate approach to costing the NAP was developed, in the context of the absence of prior estimates and limited data for Pakistan. The first three tasks were performed by the international consultant:

- **Review of the NAP document's priority actions**, the texts describing them, and the structure of the document, and of the variability of each sector's set of priority actions.
- **Identification of 11 generic "Cost Categories" of activities likely to occur in 10 or more, of the 117 NAP actions:** The concept of using "Cost categories" (i.e., activities implied in the text of many NAP actions, or assumed to be necessary, like feasibility studies, enhancing agricultural extension services, or developing a financial mechanism) was introduced by the international consultant after study of the NAP document actions.

This was an early step in assessing what actions might be needed in each NAP action, given the lack of specificity of the NAP actions.. Additionally, only a few existing projects that were both a) similar to the very specific NAP actions, and b) included disaggregated project cost data, were discovered in early online searches.

- **Assignment of one or more Cost Categories to each NAP action – indicating the type of cost data needed.** For example, if a major land use activity like expanding a large irrigation system is envisioned by a NAP action's text, both an early feasibility study and community or provincial consultations are likely to be required.
- **Dialogue with key experts at the national and provincial levels:** A questionnaire inquiring about the respondent's knowledge of the NAP process, of any studies or data on the costs of NAP actions, etc. was developed by the international consultant, and sent to about 60 experts requesting data by the local team. The ~30 responses were evaluated, and meetings or interviews were performed with about 25 respondents to solicit data and relevant studies. This work largely was undertaken by the national consultant, Tanvir Butt, and UNEP staff on the NAP Team. This questionnaire and experts' responses eventually generated about 100 project example costs of whole projects or common project elements (e.g., making existing infrastructure more resilient, or enhancing a field data monitoring system).
- **Reviewing the costs of prior and current international projects in Pakistan or the region that include activities similar to some NAP actions:** These are projects funded by and often implemented via partnerships with major funds or donors, e.g., GCF, Asian Development Bank, World Bank, UN agencies. This task was carried out primarily by the international consultant, who added the first ~ 75 cost examples to the Excel Tool (thus experimenting with how to structure the nascent Tool and to enter data into it), supported by the UN NAP team.

**Table 2: Generic Cost Categories identified in the NAP document:
to structure how to use project cost example data in the Pakistan NAP Costing Tool**

Cost Categories Identified in NAP	
Cost Category Number	Cost Category Description
1	Develop or enhance extension service, or introduce climate technology (eg, technical assistance to farmers on Climate Smart Agriculture techniques)
2	Develop financial mechanism (eg, fund, investment plan, payment for ecosystem services)
3	Develop or implement a limited plan or program (ie, smaller, less complex ones)
4	Implement broader plan or program (ie, complex, larger-scale one)
5	Implement major land management program (eg, major irrigation system or land restoration program)
6	Develop or enhance policy, legislation, regulatory program, or mainstream climate into program
7	Develop or enhance data collection or monitoring system
8	Enhance capacity building, or institutional coordination
9	Develop or enhance training, education, or communications
10	Upgrade existing infrastructure (eg, build irrigation system, reinforce health care facilities)
11	Conduct assessment or study, to support decision-making or later implementation

Source: consultant's analysis of the NAP document

Task cluster 2. New modeling methods were experimented with during the design and construction of the Excel Tool. This process was required early in the project, in order to select a way to manage the limited project cost data that was initially found, and to think through how to perform the eventual costing analysis of a larger pool of cost data generated by the project. Tasks included:

- **Entering 3 to 10 data points for each cost example into the emerging Excel Tool** (e.g., name of project, year of its costs estimates, scale of project (in number of districts, hectares, etc.).)
- **Building the new Excel “Pakistan NAP Costing Tool” to manage the data and estimate NAP action costs.**

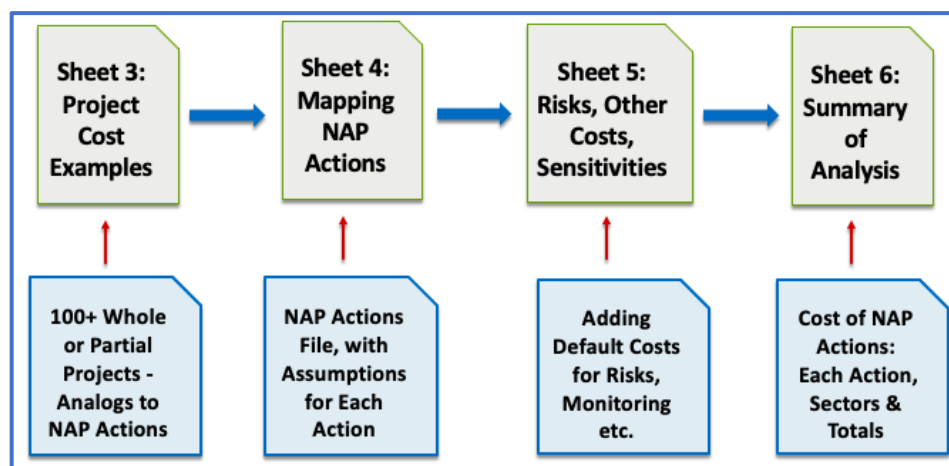
B. Description of the Pakistan NAP Costing Tool

The Tool was built to manage project and cost example data that was beginning to be discovered; and to calculate project, sector and national NAP costs. The Tool is a simple engineering cost, bottom-up type model built in Excel, which is widely used. It offers a simple, transparent data management and cost calculation tool that is built onto the framework of the Fiji Nap Costing Tool that the international consultant built for IISD and Fiji's Ministry of Economy to support estimation of Fiji's NAP cost, in use by Fiji government agencies.

The Tool is comprised of seven Excel data entry sheets that guide the input of examples of project costs analogous to the many NAP action activities. This “proxy” approach was chosen, since no cost data were readily available for specific NAP actions, whose actual cost is not known. The use of proxies in economic modeling is common, to serve as an indirect measure of a desired value, when data are limited.

Figure 1: Structure of Excel NAP Tool: Six Excel sheets guide data input

Note: initial introductory sheets are not shown



Source: consultant's presentation to NAP team in Islamabad, December 10, 2025

Three introductory spreadsheets in the Tool explain how the Tool is organized and request basic input data (e.g., inflation rate). Once project cost examples were reviewed, their key data were entered into Sheet 3: Project Cost Examples. Key data include project name, description, source of the example, year of the example's cost estimate, and cost of the entire project or more focused elements of it (e.g., community consultations; or retrofitting transportation infrastructure to enhance its resilience to climate impacts).

The 117 individual NAP actions were listed in order in Sheet 4: Mapping the NAP, using the nomenclature and numbering of the NAP document. Crucially, a set of assumptions of what activities would take place, at what scale, were made and entered for each action. These assumptions drive the cost analysis, by determining what interventions are assumed to be needed, over what area or scale (usually expressed as the number of administrative districts in which implementation would occur.)

Preliminary cost results are tallied in Sheet 5: Risks, Other Costs, and Sensitivities. Standard project Additional Costs like monitoring, gender inclusion activities, and risk assessment and mitigation are addressed in the form of default values that add these costs to the Sheet 4 estimate. Since this is a first-order costing exercise, any potential double counting of such costs that might already be included in the Sheet 4 project examples is ignored. Given the limited time available for this first costing estimate and the challenges associated with trying to detect whether or not some of the Additional Costs are included in project descriptions, it is reasonable to accept the possibility of some double counting. (This issue could be addressed by follow-up work teasing out the budgets of example project costs.) Sensitivity analyses of the impact on the cost estimates of using a lower or higher discount rate or rate of inflation can be performed in Sheet 5 as well – critical for an economy with significantly varying rates, like Pakistan over the past few years.

A summary of the Central Estimate of the cost of the NAP, adding in the Additional Costs from Sheet 5, is expressed by sector and in total in Sheet 6: Summary of Analysis. The results are provided in both PKR and USD. The results for individual NAP actions before Additional Costs are added are available in Sheet 4.

The Central Estimate is the point estimate resulting from the Tool's cost calculations, but it implies a degree of precision that is not warranted. Presenting the cost estimate as a range of values instead of as a point estimate is

best practice in economic analysis, given the set of assumptions necessary regarding what data to use, its unknown quality within a host of separate project documents, and how a given NAP action would be implemented. Thus, a range of estimates is presented, from a low-end estimate that is 30% less than the Central Estimate results, to an upper range estimate 30% higher. Results from this analysis are best presented as such a range.

The default values used for each type of Additional Costs are shown in Table 3. They can be changed, if better data or other preferences emerge. Sources of the default values are listed in the far righthand column.

Table 3: Additional Costs typical for development projects, as well as risks and uncertainties, are addressed via default values (as percentages added to cost) in Sheet 5 of the Tool

Table 3: Standard Additional Costs - Risk, Uncertainty, Gender Inclusion Activities & Monitoring, etc. Costs		
	Default Value Added to All NAP Action Cost Estimates (as % of project cost)	Source
Risk Management Costs		
Price contingencies & exchange rate fluctuations	7.00%	Asian Dev. Bank project default
Physical contingencies	3.00%	Asian Dev. Bank project default
Uncertainty of cost estimate	10.00%	default assumption
Performance delay or efficiency uncertainty	5.00%	default assumption
Standard Project Implementation Costs		
Gender inclusion activities	2.00%	default assumption
Monitoring & evaluation	3.80%	average of 4 WB, GCF projects
Project management cost	7.20%	average of 5 WB, GCF projects
other (add if needed)		
Total additional cost for these risks & activities	38.00%	

Generation of cost data, and how it is used in the Tool to estimate NAP actions' costs:

A set of steps evolved to use project cost data in the tool:

Step 1: Review each NAP action and make a set of assumptions in Sheet 4 about which activities are likely to be needed to implement each NAP action (since these are not specified), and at what scale.

Step 2: Find two or more examples of similar project costs among the Sheet 3 project examples (i.e., analogs for the assumed NAP action activities, like holding consultations, or performing a study). Enter those examples and their costs into the relevant columns of each NAP action in Sheet 4. Some actions may need three or four examples to cover the range of assumed activities for those actions.

Step 3: Using the assumptions made, average, sum, or multiply the costs entered for an action (using best judgement on the scale needed) to produce a "proxy" estimate for a specific NAP action cost. These proxies are an indirect measure of cost, since direct cost data of the specific activities envisioned in an action are limited.

These major steps involved many discrete tasks. Data and methods for the project, the analysis, and the Tool were developed by the international consultant. At an early stage, these nascent methods concepts were

discussed via several calls and emails with IISD, the national consultant and NAP Team of UN partners in the project, and project partners -- who know the local context, institutions, experts, and budget processes. The approach of finding representative project cost examples and leveraging them into NAP action cost estimates evolved during the initial two months of the project, as project data began to be found and were studied by the international consultant.

The questionnaire on project cost data was sent out to ~60 experts by the local team, and resulted in ~30 responses. A set of ~10 experts in national or provincial agencies and institutes and a few academics -- who offered the most specific potential sources of projects to review or of relevant cost data -- were identified by the consultants and local team, who started a dialogue with this group via calls and visits to their offices. Eventually these discussions produced a set of prior or ongoing projects in Pakistan that the local team mined for project case examples. Their key data needed for the Tool were entered into separate Excel spreadsheets. These data were evaluated by the international consultant, who selected which project example data would be entered into the Tool's Sheet 3 by the two U.S.-based consultants.

Two major sources of project cost data were explored:

Source 1: Internationally Funded Projects: The international consultant early on began searching for financial data on major programs and projects funded and reported by Green Climate Fund (GCF), World Bank, Asian Development Bank (ADB), etc. These projects have the advantage of having highly transparent, detailed, and consistent reporting formats. About 75 project examples in the Tool are derived from this source, and were found and entered first, and thus contributed the most to the conceptualisation of the Tool.

Source 2: Government Budget Process: The national team explained the standard annual government budget cycle process, and suggested that Public Sector Development Program (PSDP, at the national level) or Annual Development Program (ADP, at the province level) budget documents hold very detailed cost data on every government proposed or actual purchase or goods and services. However, after reviewing examples of these databases, the consultants and UNDP team concluded that PSDP data could be good but are difficult to access in the so-called "PC1" budget documents; and that those budget line items are extremely disaggregated (e.g., purchase of 12 buses; or repair of 20 building foundations). Thus, the national team was asked to focus on finding projects by following up questionnaire references from the ~10 experts, and finding cost data for about 100 whole projects or project elements, of which about 100 project activity costs were entered into the Tool. Some example projects had three or four examples selected for the Tool, while others had one or none selected depending on what types of data were needed.

Steps in costing a NAP action:

An example of how one NAP action -- Agriculture and Water sector, action 2.1 -- is provided to illustrate the methods used:

Focus of the action: Increasing hydraulic control & groundwater monitoring of Irrigation:

Assumptions made for NAP Agric./Water sector, action 2.1, to enter it into the NAP Tool:

- 1) Five large-scale projects would be implemented in each of three Districts, as pilots to increase Irrigation water control & monitoring.
- 2) Two-plus project cost examples were selected as the closest proxy activities to the NAP action.

The selected project cost example data were entered into the Tool to generate a cost estimate:

Cost of 5 pilot Irrigation projects implemented in 3 Districts
 + Cost of hydraulic control activities
 + Cost of groundwater monitoring activities
 + Cost of 2 other sub-actions
 = Cost of this NAP action

Figures 2 to 5 below are annotated screenshots from the NAP Tool that illustrate the steps in methods. Key aspects of the model are highlighted to help users learn how to understand and to enter data, and to make model runs. In the first figure, the bottom row of bold text titles identifies the type of data in the columns above. For example, the CC7 numbers in the first column refer to the Cost Category used to organize similar activity data; in this case, “Cost Category 7: Develop or enhance data collection or monitoring system”. The scale of the cost example is stated in the far-right column. for example, an assumption of the number of administrative districts that the NAP action would be implemented in (8 or 20); or the number of other units, e.g., weather data stations created, etc.

Fig. 2: Project Cost examples in Screen 3 of the Excel-based Tool comprise the project activity and cost data that can be selected into Screen 4, Mapping NAP Actions, to estimate the costs of various NAP actions

Cost Ex-ample ID	Name of Project, Program (or element of project, eg, feasibility study; or make school facilities resilient)	Status of Case.	Brief Description of Project or Project Element	Number of Units	Notes on Scale of Unit Cost
CC7-16	GCF approved FP108: Transforming the Indus Basin with Climate Resilient Agriculture and Water Management: Only Subcomponent 1.1 - Developing water accounting system	KA added	Developing water accounting system	8	8 districts in Punjab & Sindh provinces
CC7-17	Early Warning System Enhancement Project (EWSEP)	PAK Survey Forms Data Nov 29	Weather Station Installation: PKR 1.04 billion (USD 6.9 million). CC7	20	130 weather stations, 50 flood warning

Example #.

Project name.

Description.

Scale (# districts, ha, etc.)

("CC7-16" = Cost Category 7, project example #16)

Source for this set of figures: consultant’s presentation to NAP Team and MOCC, December 10, 2024

Fig. 3: Parts of Screen 3 in the Tool copied in below continue to show data input for cost examples C7-17 and CC7-17

Note: these columns occur right of the previous selected screen shot.

Cost values are presented in both PKR and in USD, including in final Screen 6 summary of costs.

Cost data are found & shown in both PKR (not shown here) & in USD

Cost Ex-ample ID	Project Cost Estimate in USD (in 2025)	Project Cost Estimate in USD per unit (in 2025)	Project Cost Note s.	Year of Cost Estimate (or: Assume 2023)	Operatio nal Years of Cost Data (eg, 3, 5)	Source Citation: Reference & Year of Budget Document, Project Report etc.
CC7-16	\$10,306,800.00	\$1,288,350.00		2019	6	GCF approved FP108: Transforming the Indus Basin with Climate Resilient Agriculture and Water Management:
CC7-17	5,723,741	\$286,187.05		2020	2020-2025	World Bank. (2020). Early Warning System Enhancement Project.

Project Cost examples in Screen 3 are mapped to individual NAP actions in Sheet 4, which lists all 117 actions. Since minimal details exist in the NAP document text to explain the scale or type of activities that would be undertaken for each action, the international consultant make a set of assumptions of:

- which activities represented by the 11 Cost Categories are likely needed to implement the action;
- which cost examples in Sheet 3 appear to be analogs for the activities assumed to be required (e.g., say “Cost Category 7: Develop or enhance data collection or monitoring system”); and
- the scale of NAP implementation (e.g., number of districts, or units (say a study of irrigation fees).

The figures below work through the example of Sector 1: Agriculture - Water Nexus, action 2.1 to show the overall assumptions in column 3; the scale of the action assumed, in column 4 -- number of districts involved; and the assumed Cost Category examples from Sheet 3 used to create the cost estimate.

Fig. 4: Assumptions are needed to assume which activities would occur in a given NAP action, and at what scale. Example of Sector 1: Agriculture - Water Nexus, action 2.1

Excel Sheet 4: Mapping the NAP Actions

“CC7-16” = Cost Category 7, project example #16

NAP Action Number	Priority Actions or measures under objective NAP text for this action:	Assumptions Made on Implementation and Scaling of Action - to Allow Modeling in Excel Tool	Assumed Scale of NAP Action. (average district Sindh is 6,910 ha)	Cost Example Assumptions to Cost NAP Action
2.1	Upgrade IBIS rehabilitation programs to modernize surface water distribution systems. Key modernization steps will include: • Increasing hydraulic control in the secondary distribution system to ensure sufficient delivery to water courses under different flow regimes.	Enhance or develop integrated informatics or monitoring system - in 5 districts in each existing extension service within 4 provinces - Sindh, Balochistan, KP & Punjab. Locations of action: above. Pilot system enhancement in 2 districts & apply to rest once proven.	20 districts total in 4 provinces	average of CC7-16 & CC7-17 - Developing water accounting & mgmt systems = development cost + 3 times that to implement in rest of districts

Project cost examples “CC7-16” & “CC7-17” from Sheet 3 are assumed to be decent proxy costs for this NAP action & entered here

Fig. 5: Example of Sector 1: Agriculture - Water Nexus, action 2.1 continued, showing the proxy costs from project cost examples CC7-16 and -17 averaged to generate the cost estimate of the action in the final column

Excel Sheet 4: Mapping the NAP Actions

Cost data in PKR & in USD:

NAP Action Number	Cost Case -- Example 1 -- Cost Estimate	Cost Case Example 1 -- Cost Estimate	Cost Case Example 2 -- Assumed Multiplier	Cost Case -- Example 2 -- Cost Estimate	Cost Case Example 2 -- Cost Estimate	Draft Action Cost Estimate (Cost Example 1 + Cost Example 2 + Cost Example 3) -- Without Standard Additional Costs	Estimated Cost of Action to Pakistan in USD (Net of shared costs)	Estimated Cost of Action to Pakistan in PKR (Net of shared costs)
2.1	CC7-16	\$206,136,000	20	CC7-17	\$114,474,820	\$160,305,410 = average cost of CC7-16 + CC7-17	\$221,221,466	61,499,567,520 = cost of estimate, inflated to 2025

Source of data:
Example CC7-16: GCF approved project FP108: Transforming the Indus Basin with Climate Resilient Agriculture and Water Management, 2019.
Example CC7-17: World Bank. (2020). Early Warning System Enhancement Project.

IV. First-order Results of Analysis

The Tool initially was constructed to model a piloting scenario in a limited set of geographies; and then a full national NAP implementation scenario was produced.

Creating Scenario 1: In order to learn how to commence making a first-order approximation of the cost of the NAP, in the absence or previous estimates, the initial modeling fabricated a piloting scenario where most NAP actions were assumed to be implemented only in 20 districts in the first NAP period. About 170 project cost examples (~90% in Pakistan) were found, reviewed and their key data relevant to costs entered into Sheet 3 of the NAP Tool. Some project examples are listed but their data are not fully entered; these are placeholders in case additional work on costing the NAP could benefit from adding their detailed cost data. This project cost database in Sheet 3 provides a body of real-world evidence that is now available for users of the NAP Tool -- who can decide what set of assumptions for implementing the NAP to model, and then can select the most-relevant project case examples of each NAP action's activities and their costs to calculate the NAP's total cost.

Scenario 1 results: These results may be termed Scenario 1) Demonstrating Adaptation. This scenario was developed to build the NAP Tool, by making the assumptions shown in Sheet 4 of the Tool for each NAP action. Little guidance was available regarding how to perform this cost estimate, regarding four critical variables:

- what activities on the ground would be undertaken for each NAP action (i.e., first conduct a study of options for the best infrastructural technology to use?; introduce a new financial mechanism?);
- at what scale would the activities be initiated? (i.e., start in one province?, in all provinces?, in all districts?);
- what timeframe to assume that full funding for NAP implementation -- probably trillions of PKR -- was successfully raised, and human capacity available?; and
- what is the rate of implementation of NAP actions?, i.e., start all in year one of the period, or phase them in?

The lead consultant initially assumed that Pakistan (or any country) would find it very challenging to implement all 117 NAP actions at the full scale of all 166 districts in Pakistan starting in year one. Further, the consultant assumed that securing all the funding and creating the human capacity to implement every action in every district of the country during the first NAP period did not seem feasible. Hence, a limited implementation approach was explored in Scenario 1.

Scenario 1: Demonstrating Adaptation, is a learning-by-doing scenario that recognizes existing constraints in Pakistan. This scenario assumes the NAP program would start slowly, piloting the NAP actions in about 20 districts initially, due to limited capacity & funding. But the NAP program would rapidly learn lessons in the first period of 2025-2030, then potentially find more abundant funding and expertise to expand in the second and later periods. The scenario indirectly assumes enough of the required human and institutional capacity, and enough funding, to implement most actions in 20 districts are found and ready to be utilized at the start of the first NAP period in 2025.

The first-order indicative cost of implementing Scenario 1: Demonstrating Adaptation is shown in the figure below: a range of 1.1 Trillion PKR to 2.0 Trillion PKR, around a Central Estimate of PKR 1.5 Trillion. This equals about USD 3.9 Billion to 7.3 Billion. This scenario, once again, assumes that NAP implementation would start in a total of 20 districts for most NAP actions, to pilot them. (Another ~20-some actions are already assumed to be national in scale in the Tool, such as a study of modernizing the *abiana* irrigation water-pricing framework in the Agriculture and Water sector.) Results also are provided by individual NAP action (in Sheet 4), and for each sector (In Sheet 6). The next figures were developed for the December 10th presentation.

Fig. 5. First-order approximation of the indicative cost of Scenario 1: Demonstrating Adaptation -- the Central Estimate

Note: the range of the estimate is shown in Table 6 below.

Calculated into Sheet 6 of Tool (rounded to thousands)

Note: Natural Capital, & Agric. / Water sectors largest

	Number of Priority Actions	Central Estimate	
		Estimated Cost of Action to Pakistan in USD (Net of shared costs)	Estimated Cost of Action to Pakistan in PKR (Net of shared costs)
Sector 1: Agriculture - Water Nexus	16	\$999,792,000	\$277,942,164,000
Sector 2: Natural Capital	19	\$2,661,318,000	\$739,846,474,000
Sector 3: Urban Resilience	20	\$538,829,000	\$149,794,338,000
Sector 4: Human Capital	19	\$790,906,000	\$219,871,934,000
Sector 5: Disaster Risk Management	25	\$449,686,000	\$125,012,822,000
Sector 6: Gender, Youth, and Social Inclusion	18	\$216,864,000	\$60,288,187,000
Total Number of Priority Actions	117	\$5,657,395,000	\$1,572,755,919,000

Fig. 6. Scenario 1 first-order indicative cost shown as a range from a low and a high estimate, +/-30% around the Central Estimate
(rounded to thousands)

	Low Value (Minus 30% of Central Estimate)		High Value (Plus 30% of Central Estimate)	
	Estimated Cost of Action to Pakistan in USD (Net of shared costs)	Estimated Cost of Action to Pakistan in PKR (Net of shared costs)	Estimated Cost of Action to Pakistan in USD (Net of shared costs)	Estimated Cost of Action to Pakistan in PKR (Net of shared costs)
Sector 1: Agriculture - V Nexus	\$699,854,000	\$194,559,515,000	\$1,299,730,000	\$361,324,814,000
Sector 2: Natural Capital	\$1,862,923,000	\$517,892,532,000	\$3,459,714,000	\$961,800,417,000
Sector 3: Urban Resilience	\$377,180,000	\$104,856,037,000	\$700,477,000	\$194,732,640,000
Sector 4: Human Capital	\$553,634,000	\$153,910,354,000	\$1,028,178,000	\$285,833,515,000
Sector 5: Disaster Risk Management	\$314,780,000	\$87,508,975,000	\$584,592,000	\$162,516,668,000
Sector 6: Gender, Youth Social Inclusion	\$151,805,000	\$42,201,731,000	\$281,923,000	\$78,374,643,000
Total Number of Priority	\$3,960,176,000	\$1,100,929,144,000	\$7,354,614,000	\$2,044,582,697,000

Results for Scenario 2: Full National Implementation.

This scenario indirectly assumes that full funding to start all actions is available and ready to be deployed in 2025 at the start of the first NAP period, as well as all required human and institutional capacity. The scenario models the cost of implementing all NAP actions in all districts nationwide in the first NAP period.

Ministry of Climate Change and Environmental Coordination (MOCC&EC) senior officials requested that the costing being expanded from the initial piloting approach of Scenario 1 to implementation of all NAP actions in all 166 districts, during discussions in Islamabad in early December.

The international consultant and an Excel consultant working with him reviewed all the existing assumptions made for Scenario 1 (i.e., mostly initially piloting the NAP actions in 20 districts). They scaled up those assumptions in Scenario 2 by assuming implementation would start in all 166 of Pakistan's districts (or in 155 rural districts larger than 1,000 hectares for space-extensive actions, e.g., irrigation, land restoration).. Again, some 20 NAP actions are already considered national in scale as in Scenario 1, when a single study or a limited set of interventions constitute a national action (i.e., one or a few studies of an issue or demonstrations of a land-use practice suffice).

The first-order indicative cost of implementing Scenario 2: Full National Implementation is shown in the figure below: a range of 2.6 Trillion PKR to 4.9 Trillion PKR, around a Central Estimate of PKR 3.8 Trillion. This equals about USD 13.7 Billion to USD 17.8 Billion.

Fig. 7. First-order indicative cost estimate for Scenario 2: Full National Implementation

	Number of Priority Actions	Central Estimate - Indicative Cost		Low Value - Indicative Cost (Minus 30% of Central Estimate)		High Value - Indicative Cost (Plus 30% of Central Estimate)	
		Estimated Cost to Pakistan of NAP Actions - IN USD (Net of shared costs)	Estimated Cost to Pakistan of NAP Actions - IN PKR (Net of shared costs)	Estimated Cost to Pakistan of NAP Actions - IN USD (Net of shared costs)	Estimated Cost to Pakistan of NAP Actions - IN PKR (Net of shared costs)	Estimated Cost to Pakistan of NAP Actions - IN USD (Net of shared costs)	Estimated Cost to Pakistan of NAP Actions - IN PKR (Net of shared costs)
Sector 1: Agriculture - Water Nexus	16	\$5,136,696	Rs1,427,723,506	\$3,594,987	Rs999,406,454	\$6,676,405	Rs1,856,040,558
Sector 2: Natural Capital	19	\$6,588,465	Rs1,831,593,350	\$4,611,926	Rs1,282,115,345	\$8,565,005	Rs2,381,071,355
Sector 3: Urban Resilience	20	\$538,829	Rs149,794,338	\$377,180	Rs104,856,037	\$700,477	Rs194,732,640
Sector 4: Human Capital	19	\$790,906	Rs219,871,934	\$553,634	Rs153,910,354	\$1,028,178	Rs285,833,515
Sector 5: Disaster Risk Management	25	\$449,686	Rs125,012,822	\$314,780	Rs87,508,975	\$584,592	Rs162,517,668
Sector 6: Gender, Youth, and Social Inclusion	18	\$216,864	Rs60,288,187	\$151,805	Rs42,201,731	\$281,923	Rs78,374,463
Total Number of Priority Actions	117	\$13,720,446	Rs3,814,284,137	\$9,604,312	Rs2,669,998,896	\$17,836,580	Rs4,958,569,379

Validation workshop for the project:

The consultants and the NAP Team prepared and co-facilitated a half-day meeting in Islamabad on December 10, 2024, with ~65 stakeholders to share the activities and early results of the consultancy. A detailed presentation was given by the international consultant, followed by extensive dialogue. Five breakout groups were formed to discuss one or more of five questions listed in the presentation (and below) to solicit viewpoints and additional information relevant to the costing project and elaboration of the methods and the Tool. The local team organized the event.

Dialogue during the workshop and meetings with the project partners before and after it led to the addition of Scenario 2 to the Tool, which expanded the cost analysis from the 20-district piloting approach of Scenario 1 to all 166 districts (or to the 155 rural districts for land use actions). Other significant insights from the workshop include learning that a number of consulting firms, institutes, or UN agencies are beginning work on costing adaptation actions in Pakistan; and

Breakout group discussion topics:

- 1) Does this overall approach make sense to you?
- 2) Are there issues that need to be addressed?
- 3) Are there other sources of better data, closer to NAP action text descriptions, that should be considered?
- 4) Does the NAP, in its current form, offer a feasible path forward to implementation of its actions?
- 5) How can Pakistan's vast human & technical resources be called on to help improve tasks like this one?

A summary of the group discussion is included in Annex 2.

V. Issues, Potential Next Steps, and Recommendations

A. Observations and issues noted by the consultant

Issues the NAP team appears to be facing, and needs to find solutions to:

- **No convincing estimates are possible without deciding what activities, at what scale or number of districts are planned** -- for each of the districts or other metrics that would be activated for each of the 117 NAP actions.
- **As no prior estimates of the cost of the NAP exist, and no obvious tool was available for this purpose, the consultant had to develop a new Tool.** No obvious source of relevant project cost data was apparent in the early months of the project, which slowed work in determining how to structure the model. Significant work is underway in several national government agencies, institutes, private consulting firms, UN agencies, and donor or bilateral programs that needs to be assessed and consulted, as work on costing the NAP continues.
- **The NAP team has just been exposed to the new Tool during the consultant's Islamabad mission. Thus, it needs to learn the NAP Tool.** They discussed potentially introducing training sessions remotely or in the provinces in use of the Tool, if it is an approved approach to costing the NAP.
- **This estimate represents the best cost estimate possible given the time and data available.** The NAP team may want to review the matching of cost examples with the assumed NAP actions, and seek further clarity on what the ministries and experts proposing each action had in mind on the ground.
- **The relationship between provincial adaptation processes and priorities and the national NAP process appears uncertain and needs to be discussed and resolved.** Provinces are the likely implementers of most NAP actions, virtually all attendees in meetings in Islamabad agreed.
- **Pakistan has many experts, but the project team did not find a centre or locus of expertise to work with. Capacity for this type of analysis is slim and needs to be enhanced.**
- **The decision to hire an international consultant with no experience in Pakistan was suggested in stakeholder discussions as a factor that slowed the work.** The international consultant was tasked with leading the methodological aspects, supported by a national consultant very familiar with the existing institutions, relationships, etc. This combination of backgrounds offered a strong partnership. However, obtaining detailed cost data initially was not fully recognized as a major barrier to costing the NAP.
- **Global Climate Change Impact Studies Centre (GCCISC), for example, anticipates it will perform a costing of adaption exercise as part of its duties leading the revision of the NAP during 2025.** Its Executive Director, Dr. Muhammad Arif Goheer, informed the consultant of this expectation during a meeting at the Centre after the workshop.
- **Pakistan has limited capacity and no clear process to produce high-quality proposals to support the implementation of the NAP activities:** to ADB, World Bank, GEF, Adaptation Fund, GEF, bilateral donors, etc. MOCC&EC, the NAP team & partners need to Identify the highest priorities for seeking funding, and build capacity to assist proposals. The whole NAP is unlikely to be funded in the same timeframe.

B. Direct and indirect outcomes of the project

- **The biggest benefit of this project so far has been the process of identifying stakeholders in costing of the NAP, and bringing them together in a meeting to share the project's Tool, methods and early results.**

- The project has convened a network of experts in government, provinces, research institutions and consultants that could be tapped to contribute to this major task over the next months or years.
- About 150 projects or elements of projects that are analogs to proposed NAP actions have been reviewed, and some of their costs entered into the Tool, in Sheet 3. This offers a rich treasury of experience that the NAP process can mine for solutions to issues it faces, or for potential sources of innovation.

C. Recommendations

MCC&EC and NAP Team staff requested that this report include recommendations, despite the consultant's limited comprehension of the context in Pakistan. Several recommendations are offered below, to encourage MCC&EC officials, the NAP Team, and stakeholders to reflect on the status of the NAP process at present, and how it could be advanced.

Recommendation 1: The roles in the NAP process of the national government agencies (largely setting policy goals, planning, seeking funding) and the provincial government actors (primarily selecting which actions to implement where, community consultations, and implementation) needs to be better clarified. A process for these dialogues needs to be enhanced or created.

Recommendation 2: The NAP team and MOCC&EC should undertake a crisp, one- or two-month stocktaking exercise now – before making any major decisions about a) the potential use or enhancement of this Tool and its 1st-order results; and b) evaluating the options presented that could accelerate the NAP process. This self-appraisal could assess if the current NAP document offers an adequate foundation on which Pakistan can build strategic plans and seek funding to adapt to climate impacts; and how best to organize and plan work looking forward.

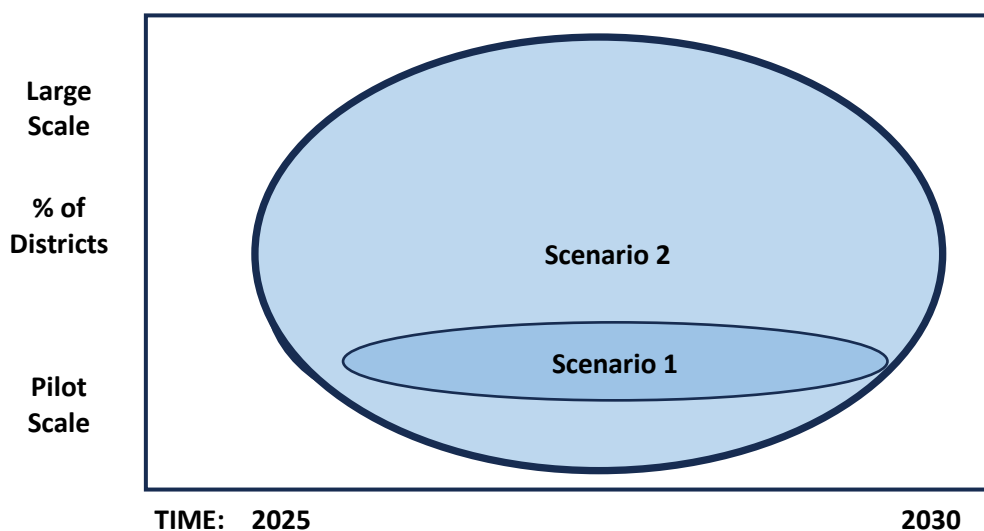
Recommendation 3: The NAP team should review the very large set of assumptions made in the Tool about which activities, at what scale, would comprise each NAP action, and amend any where better information becomes available about what the NAP drafters intended.

Recommendation 4: Use of a scenario approach to costing the NAP will facilitate the NAP team's ability to reflect the potential likelihood and feasibility of securing the necessary funding and the human capacity to implement the massive set of NAP actions.

Also note that some NAP actions are inherently national (e.g., a feasibility and design study of alternative irrigation pricing schemes; or a plan to mainstream gender and social inclusion in NAP education actions), and thus do not require scaling up from initial demonstration actions. Some other actions are largely relevant only for some districts, e.g., those featuring a limited-distribution ecosystem (like large conifer forests in the north), or a predominately urban district. Table 5 below reviews three scenario options.

Table 5: Two existing scenarios in the Tool and one potential scenario for costing the NAP

Scenario	Scale	Activities & Rationale
Scenario 1) Demonstrating Adaptation (the initial piloting-scale assumption)	Select ~ 20 districts total (say 5 in each of the 4 provinces) to demonstrate the feasibility of NAP actions; plus ~20 inherently national actions.	Demonstrate feasibility of planning & implementing all the NAP actions. Develop some say National-Provincial Collaborative Partnerships for NAP, to test partnerships.
Scenario 2) Full National Implementation (added to the Tool)	Plan & implement all NAP actions in all districts nationwide: in all 166 districts, or in 155 rural districts for space-extensive actions (e.g., land restoration).	Totally commit to implementing the entire NAP. Seek funding & build capacity for this huge effort. Allows cost estimate for the entire program.
Scenario 3) Large-Scale Piloting (potential scenario that could be developed; not in the Tool now)	Plan & implement all NAP actions in moderate, feasible number of, say, ~15 districts for each of 4 provinces = 60 districts (or: say 40% of districts, = 66 districts).	Build capacity to implement a medium number or % of all districts, jumpstarting the NAP process. Significant level of NAP action, but not as demanding as Scenario 2.

Figure 9: Conceptual scale and timeframe of the two scenarios

Recommendation 5: Finish developing a NAP Financial Strategy that highlights the actions that should be advanced first.

- A strategy is important for setting the highest-priority actions for technical assistance for proposals and for use of early funding made available. All 117 actions are unlikely to be funded in the near term, and they compete with each other for funding, so a plan is important.
- While Pakistan will need a more accurate estimation of the methods and funding needed for implementation of the entire NAP, this potentially could come later.
- Establish which actions are high priority for advancing planning for their implementation, and for seeking funding necessary to implement them.

Recommendation 6: Consider developing “Climate Change Adaptation Investment plans” by sector or by province, to offer finer granularity in cost estimates for high-priority adaptation actions. Through these plans, priority adaptation investments for short- and mid-term implementation could be accurately appraised, and their costs estimated more accurately.

Recommendation 7: The NAP team should create a team to provide technical assistance to the most promising proposals. Great proposals win funding! This team could be comprised of existing staff and other volunteers from the government agencies, provinces, or others, and be tasked to:

- Analyze donor priorities, application requirements, schedules, financial and technical information needs
- Set criteria for deciding proposals eligible for assistance.
- Set ambitious but feasible goals for funding: e.g., develop say two GCF or Adaptation Fund Concept Notes, and two bilateral proposals by July 31st?

Recommendation 8: The NAP Program and MOCC&EC should reflect on how to jumpstart the slowly evolving NAP process, by assessing options to do so, and produce an “QuickStart Action Plan” in the first quarter of 2025.

There are a number of options available that offer relatively simple, feasible actions that could advance the NAP evolution, enhance partnerships for the NAP, and solve existing barriers (e.g., like uncertain national-province relationship on implementation and funding. Table 6 offers a menu of possible smaller- and larger-effort options for consideration.

Table 6: Potential activities MOCC&EC and the NAP Team could undertake to jumpstart the NAP Process

Source: consultant’s prior experience, and meetings in Islamabad, December 9-11, 2024

	Potentially lower effort, near-term
	Potentially larger effort & cost, longer-term

Option	Potentially High-Priority NAP Process Activities	Requirements	Pros	Cons
1) Review other existing costing estimates & efforts underway	Assemble & compare existing cost estimates for NAP-like actions and scale in Pakistan.	1-2 staff or consultants for 3? weeks	Learn methods & comparability of estimates.	None apparent.
2) Develop South-South peer technical assistance exchanges	Visit peer country or invite in several practitioners to share experience in costing major programs (ideally of a NAP).	Funding 1-2 staff or visiting experts, for ~4-day visit	Simple, quick & valuable insights, low cost.	Need to find funding, & keep cost low.
3) Create a NAP Costing Team	Create task team across several agencies, with 4- to 6-month mandate to produce a consensus costing by an agreed date.	1) Borrow or hire staff needed, with comfort in program finance & Excel. 2) Mandate from MOCC. 3) Clear guidance.	Simple, low cost. Trains staff across several agencies.	Could be challenging to find staff and manage them.

4) Convene a NAP Costing Workshop	Invite key players interested in cooperating on Costing & funding the NAP to discuss: a) their costing-relevant activities, b) how to overcome barriers, c) the optimal roadmap forward for costing & eventually financing the NAP.	1) 1-2 conveners to organize; 2) modest funding.	Low-cost way to assess various approaches.	Convener may be forced to reveal early plans or results.
5) Provide tech assistance to promising funding proposals for NAP actions	Draft concept notes & proposals need help with climate rationale, Theory of Change, financials, etc. to succeed.	1) 2-3 part-time staff; 2) outreach plan to monitor donors' priorities & requirements; 3) travel to a few GCF, etc. meetings.	Likely to improve proposals' chances of funding.	Need to find people & funding for this.
6) Revise NAP action texts	Critical need. Empower a federal/provincial government? process to specify every NAP action's activities & scale.	1) lead agency & staff for process; 2) consensus on this approach; 3) agreed governance model.	Could solve critical problem; & engage provinces, at low cost.	May be difficult to manage the process & to share data.
7) Develop National-Provincial Collaborative Partnership for NAP	NCPC could be informal working arrangement to work thru NAP planning, implementing & implementation issues; and/or to revise NAP action texts.	1) Explore feasibility; 2) meet with small to medium set of representatives; 3) reach agreement.	Could address province-national issues.	Forum for this may already exist?
8) Develop or enhance Strategic Finance Plan for NAP	NAP process needs to identify funding needs, priorities & sources, to implement the NAP.	1) Small team available; 2) staff knowledgeable about GCF, ADB, etc. processes; 3) funding.	Could set priorities for funding among competing proposals.	May be hard to get agreement on process, priorities, and timeframe.

Recommendation 9: The NAP team and MOCC&EC should consider prioritising early pilot project implementation of one or more NAP actions, as an inexpensive way to learn early lessons and prevent later failures. Pilots have a power far beyond their small scale – they demonstrate that something can be done, and how to do it; and can be highly visible.

Recommendation 10: The private sector can play a role in the NAP process and in investing in some types of adaptation activities—but needs to see a business case for this, and be offered some incentives or removal of barriers. Privates can play many potential roles (e.g., supply transportation services, financial services, equity stake in new projects in some cases, feasibility studies, etc.) A private-public dialogue on adaptation could be launched to explore the role for private entities. Private entities are partnering with government and NGOs to offer financial services, logistical support, and technical advice in several other countries.

Annexes:

Annex 1: December 10, 2024 workshop presentation

Annex 2: Summary of December 10, 2024 breakout group discussion



Methods and Early Results of NAP Costing Project

MEETING ON COSTING EXERCISE OF THE PAKISTAN NATIONAL CLIMATE Draft Results of Project: “High-Level Estimate of Cost of Implementing Pakistan’s National Adaptation Plan (NAP)”

December 10, 2024

Ken Andrasko

AltaVerde Consulting, Washington , DC

consultant to IISD

Bethesda, MD USA kandrasko3@gmail.com



Overview of presentation

1. **Background: climate & adaptation costs**
2. **Overview of Pakistan's NAP & challenges in estimating its costs**
3. **Methods selected for estimating NAP action costs**
4. **Preliminary, *1st-order* results of analysis**
5. **Issues & potential next steps**



I. Climate impacts are real



AP Photo/Khalid Tanveer

Pakistan faces warming of 1.3°C - 4.9°C by 2090s, over 1986–2005 baseline.

- **Frequency & intensity of extreme climate events** is projected to increase, . . . & erratic monsoon rains, causing frequent & intense floods and droughts.
- **Projected recession of the Hindukush-Karakoram-Himalayan glaciers** due to global warming, threatening water inflows into Indus River System.
- **Indus floods 2022 displaced 8 million, and cost >\$30 billion in crop and infrastructure damage.**
- **World Bank estimates that failure to adapt to climate change in coming years could reduce Pakistan's GDP by 18 to 20 percent by 2050.**

II. Climate finance - Demand Side

Escalating but uncertain global Adaptation cost estimates

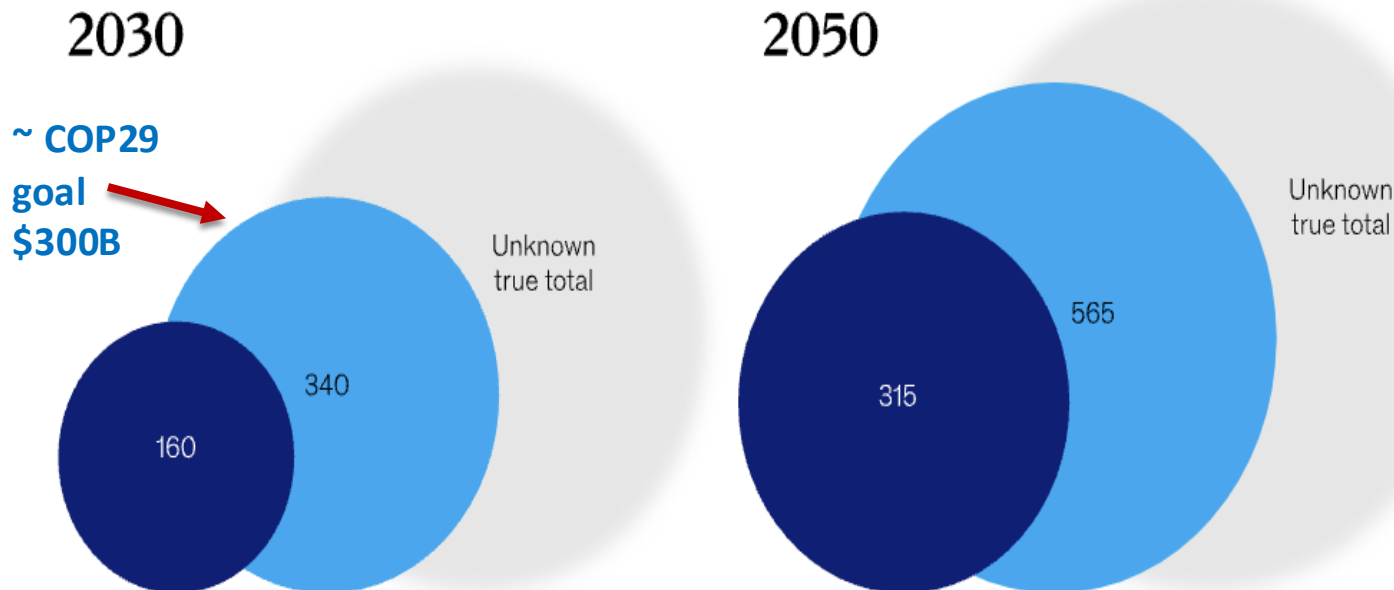
*AltaVerde
Consulting LLC*

Climate finance for Adaptation globally:

COP 29 negotiations: G77 & China adaptation estimate of \$1.3 trillion

Current estimates show climate adaptation funding needed by developing countries rising by close to 65 percent from 2030 to 2050.

UNEP¹ estimate of annual adaptation funding needs in developing countries, \$ billion



Graphic source: McKinsey & Co., 2024. Ten key requirements for a systemic approach to climate adaptation

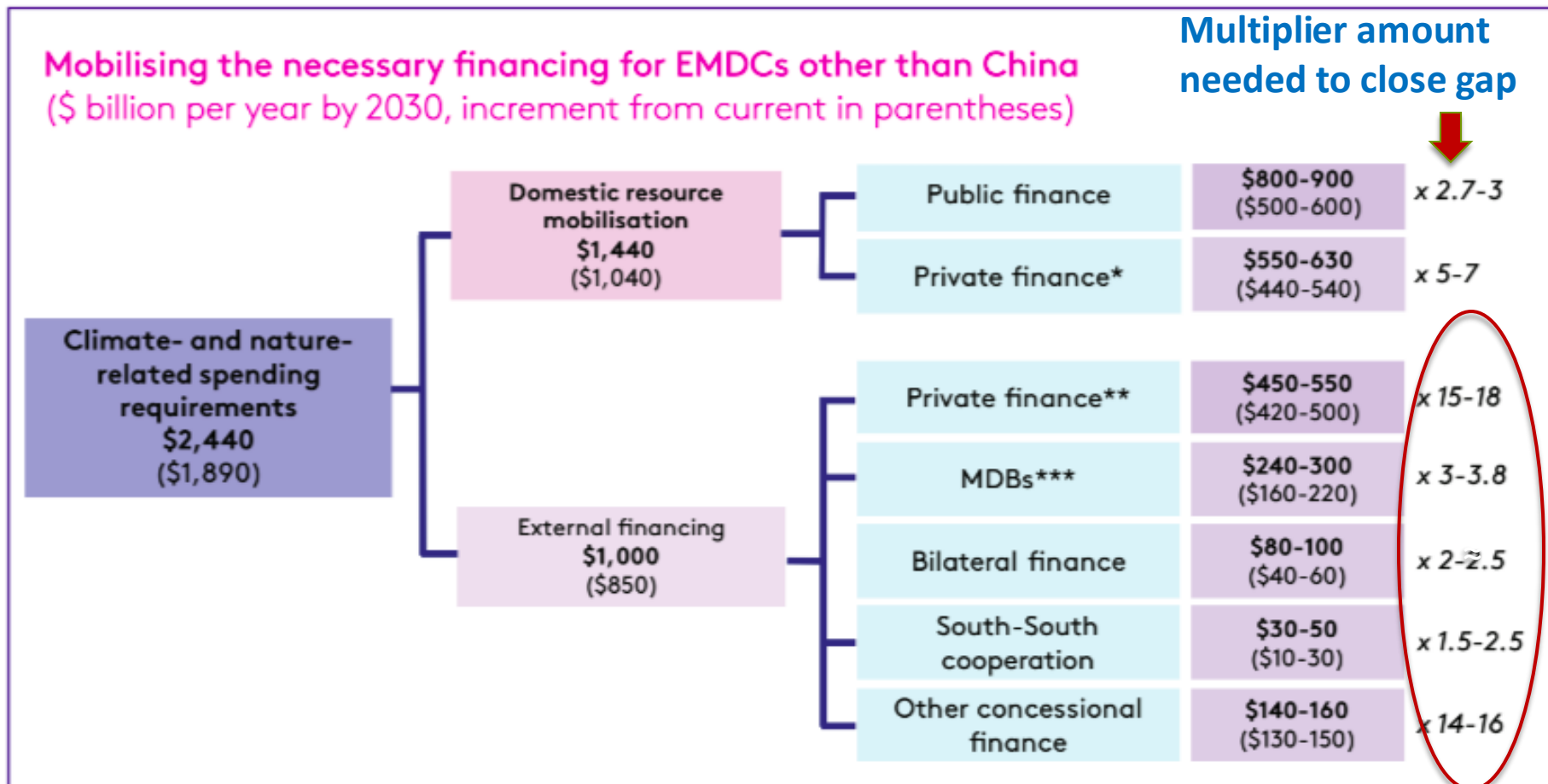
Climate finance - Supply Side.

Challenging conditions now – and huge needs.

COP 29 negotiations: COP text goal of \$300m

AltaVerde
Consulting LLC

Financing required for Emerging Markets & Dev. Countries (not inc. China):



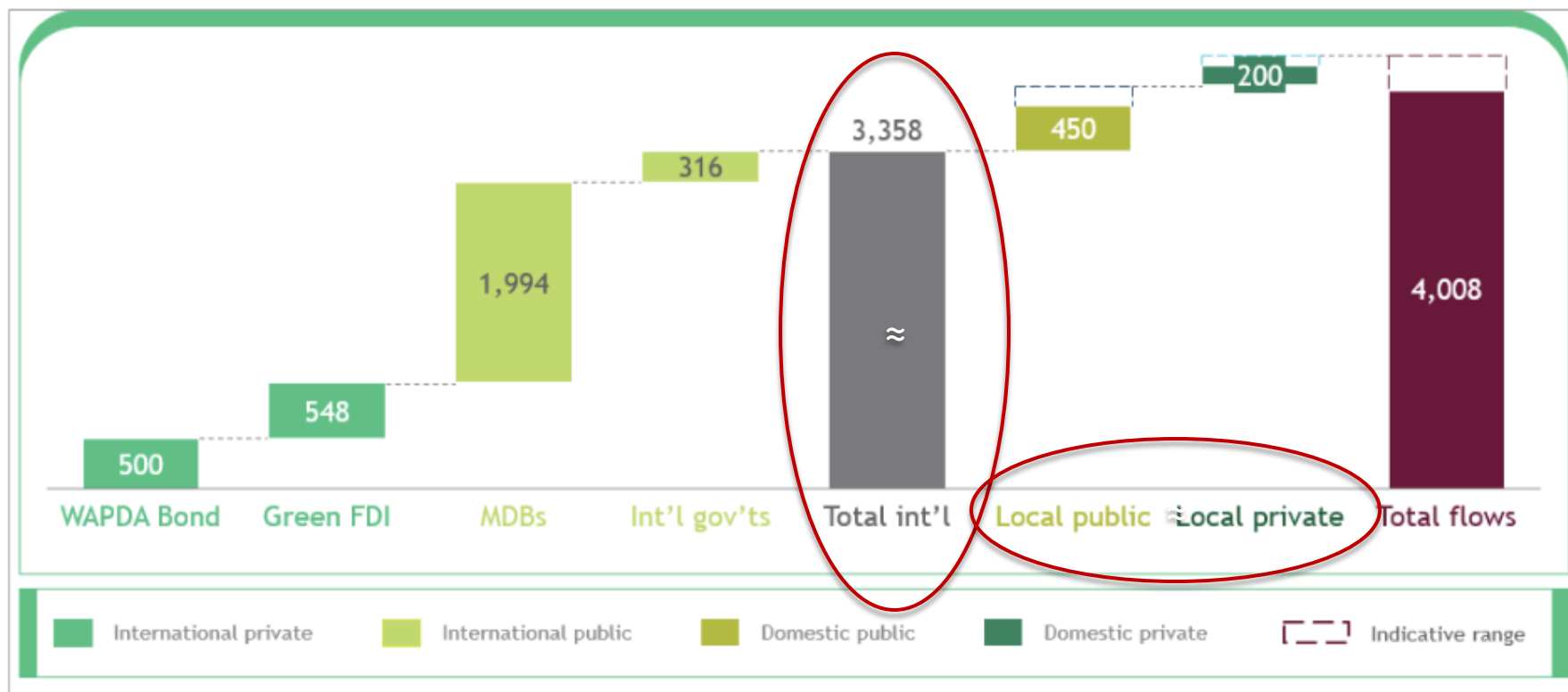
Source: Bhattacharya A, Songwe V, Soubeyran E and Stern N (2024). Raising Ambition and Accelerating Delivery of Climate Finance. London: Grantham Research Institute. Third report of Independent High-Level Expert Group on Climate Finance. London School of Economics and Political Science.

Pakistan: climate finance is 88% international, minimal domestic & private finance – could those sources be increased? (NDC, 2021 numbers)

AltaVerde
Consulting LLC

SOURCE: UK ACCELERATION GREEN FINANCE REPORT

Figure 7: Climate-related finance in Pakistan broken down by source in 2021 (US\$ millions)



- Pakistan's 2021 estimated spending on Adaptation & Restoration was ~US\$1 billion, **→ funding gap of ~16 x more to provide funding needed.**
- In 2021, financing for mitigation estimated ~US\$3 billion, -- ~5x gap vs. needs.

II. How much will it cost Pakistan to adapt to climate change?

1st general approach in use: “Top-down” cost estimation

- **World Bank, etc. use Top-down Partial Equilibrium models** of the whole national economy – all sectors, with dynamic interactions.
- World Bank modeling in 2021 estimated Pakistan needs to invest **\$152 Billion for adaptation and resilience by 2030** to meet its Nationally Determined Contribution (NDC) under 2015 Paris Agreement.
- Equivalent to ~2.6% of Pakistan’s GDP through 2030.
- Such models are: Complex, expensive, slow, but model the whole economy well.
- **But: they cannot model the set of very specific NAP actions. Thus, another approach is needed.**



Photo: Curt Carnemark/World Bank, “Rural road in mountains”

Pakistan's NAP & challenges in estimating its costs

*AltaVerde
Consulting LLC*

NAP is ambitious document, by Ministry of Climate Change

- 2023. 122 pages.
- Identified 6 vulnerable sectors, including 2 crosscutting sectors.

Challenges inherent in the NAP document & costing it:

- **Govt. seeks rapid, highly comparable set of cost estimates for all adaptation measures in NAP – water, agriculture, infrastructure, etc.**
- **117 NAP activities identified - but no detail, 1-2 sentences.**
- **No cost estimates provided, or discussed.**
- **Activities not explicit re assumptions of what activities comprise each NAP measure; or What scale is envisioned?**
 - **Eg, how many solar irrigation pumps installed? In every province, or just 1 or 2?**

Traditional cost-benefit analysis unworkable for this exercise

Hard to do this for 117 complex NAP actions . . .

Eg, Cost : Benefit Economic analysis of sewerage & water treatment plants in Pakistan

Source; JICA study
https://openjicareport.jica.go.jp/pdf/11888070_08.pdf

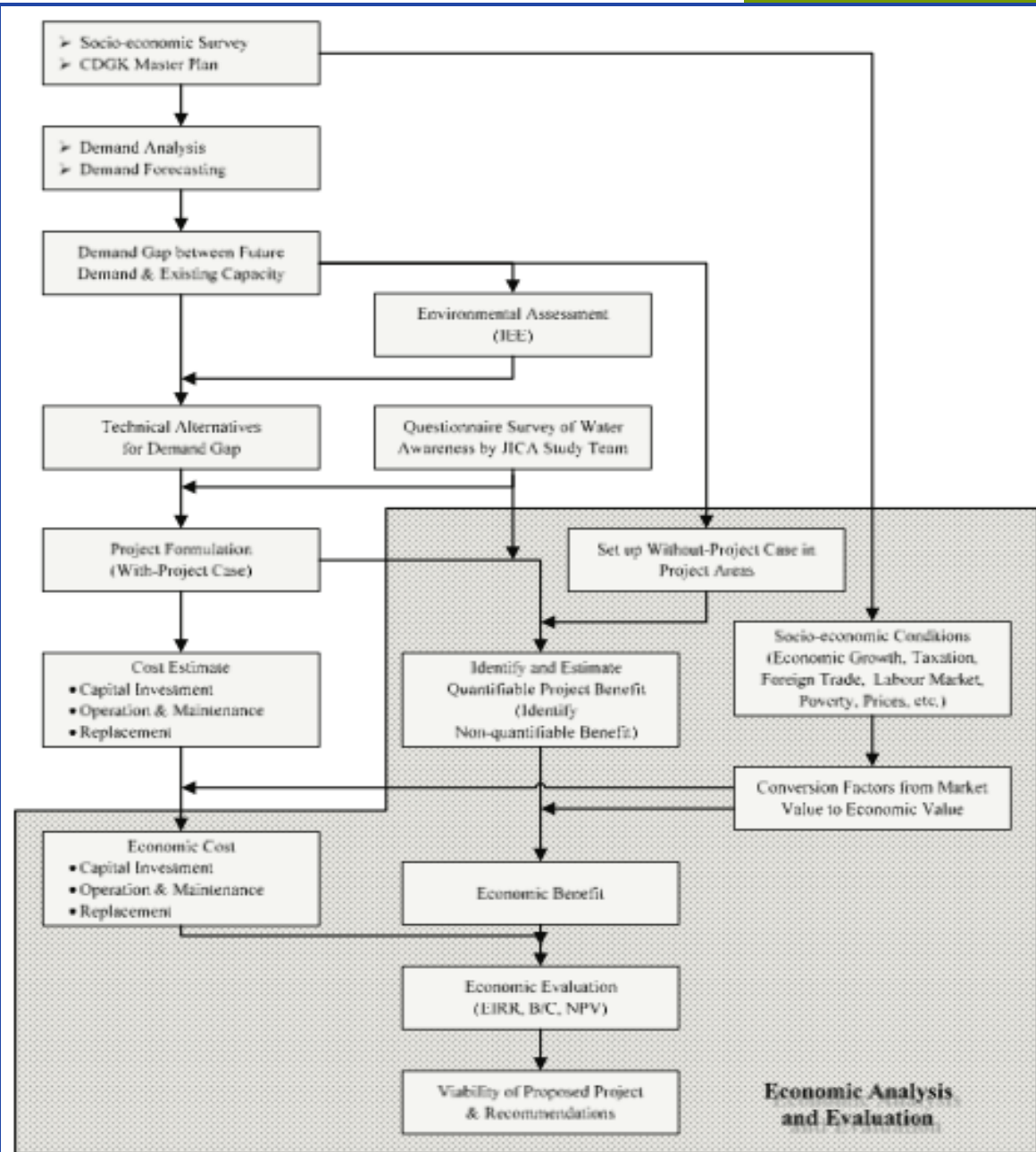


Figure 112.2.1 Flow Chart of Economic Evaluation Procedure in Master Plan Stage

Simpler methods needed for NAP's minimal text describing actions, vs. field realities.

For example: NAP action Agric. / Water sector, action 2.1:

*AltaVerde
Consulting LLC*

Map of irrigation system in
central Sindh, FAO



“Upgrade IBIS rehabilitation programs to modernize surface water distribution systems. Key modernization steps will include:

- “Increasing hydraulic control in the secondary distribution system to ensure sufficient delivery to water courses under different flow regimes.
- “Improving real-time groundwater monitoring in canal command areas to facilitate conjunctive management of ground and surface water.” (+ 2 more sub-actions)
- Sindh experts have specific data for existing projects.
- But hard to find . . . For 117 complex NAP actions . . .
- & hard to match with NAP specifics

Method selected: Requires: 1) making assumptions of NAP actions' activities & scale; & 2) using “proxy” estimates from real projects that partially match NAP actions

*AltaVerde
Consulting LLC*

Approach to costing a NAP action:

- 1) Set assumptions about scale & activities of each NAP action (since not specified),
- 2) Find 2+ examples of similar project costs (ie, analogs for a NAP action),
- 3) Assume averaging or summing them can provide a “proxy” for a specific NAP action cost. (“proxy” = indirect measure of desired value, since data are limited).

SUM: Impossible to estimate costs if you don't state what you plan to do!

NAP Example : Increasing hydraulic control & groundwater monitoring of Irrigation:

Assumptions: for NAP Agric./Water sector action 2.1:

- 1) 5 large-scale projects implemented in 3 Districts, as pilots to increase Irrigation water control & monitoring.
- 2) Select 2+ project cost examples found, for closest proxy to NAP action.
- 3) Enter example data into Excel to generate cost estimate:

Cost of 5 pilot Irrigation projects implemented in 3 Districts
+ Cost of hydraulic control activities
+ Cost of groundwater monitoring activities
+ Cost of 2 other sub-actions
= Cost of this NAP action

Method: Explored 2 sources of project cost data

*AltaVerde
Consulting LLC*

Sources of data:

**Make assumptions
& seek proxy data**

Option 1: Gov't. Budget Process:

Find cost of similar project or action in govt. budget project:

- Public Sector Dev. Program (PSDP: federal)
- Annual Dev. Program (ADP, by province)

Consultants & UNDP team discussion concluded:

- PSDP data good - but hard to get budget details from their "PC1" budget documents.
- So, team focused on finding projects online & by following up Questionnaire references.

Option 2: Internationally Funded Projects:

Find cost of major activities within a World Bank, ADB, etc. project.

- Relevant projects from our Questionnaire replies & online GCF & ADB proposals.

Sources of data used:

- 1) Identified 11 “Cost Categories” within 117 NAP actions.
- 2) Found 100+ real projects that are analogs to NAP actions.
- 3) Entered project examples into Excel, by the 11 Categories.

*AltaVerde
Consulting LLC*

Cost Categories Identified in NAP, for Use in Pakistan NAP Costing Tool

Cost Cat.	Cost Category Description
1	Develop or enhance extension service, or introduce climate technology (eg, tech. assistance to farmers on Climate Smart Agriculture techniques)
2	Develop financial mechanism (eg, fund, investment plan, pay for ecosystem services)
3	Develop or implement a limited plan or program (ie, smaller, less complex ones)
4	Implement broader plan or program (ie, complex, larger-scale one)
5	Implement major land management program (eg, major irrigation system or land restoration program)
6	Develop or enhance policy, legislation, regulatory program, or mainstream climate into program
7	Develop or enhance data collection or monitoring system
8	Enhance capacity building, or institutional coordination
9	Develop or enhance training, education, or communications
10	Upgrade existing infrastructure (eg, build irrigation system, reinforce health care facilities)
11	Conduct assessment or study, to support decision-making

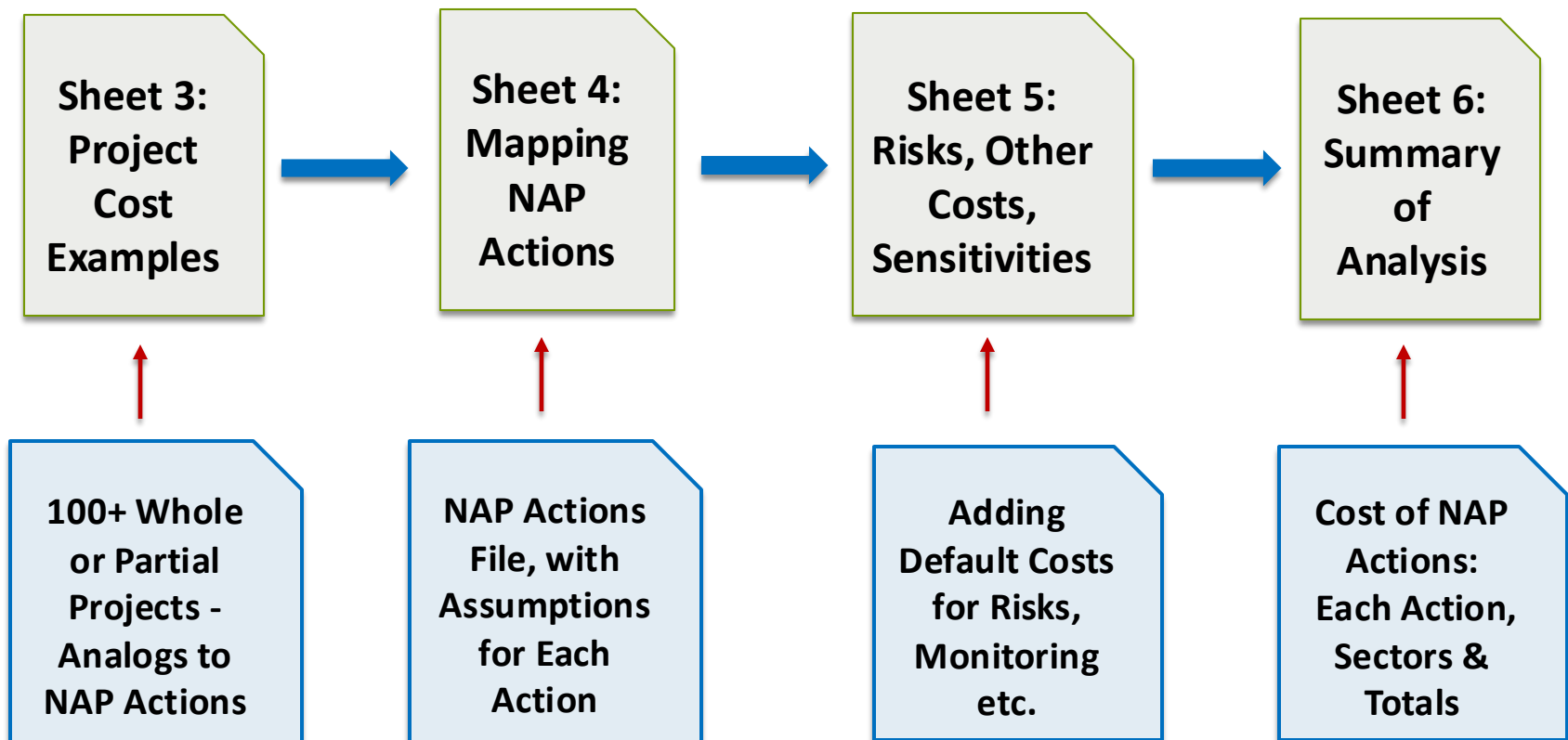
Built “Pakistan NAP Costing Tool” to manage data

*AltaVerde
Consulting LLC*

Excel model –

Similar to model built for & used by Fiji govt. agencies.

- Structure of Excel tool: simple engineering cost, bottom-up method.
- 6 Excel sheets guide data input



Peeking inside the Excel Tool: 1 Project cost example analogs are entered in Excel Sheet 3.

AltaVerde
Consulting LLC

Example: for NAP Agric./Water sector action 2.1:
Use project examples in **Cost Category #7: “Develop or enhance data collection or monitoring system”**

Cost Ex-ample ID	Name of Project, Program (or element of project, eg, feasibility study; or make school facilities resilient)	Status of Case.	Brief Description of Project or Project Element	Number of Units	Notes on Scale of Unit Cost
CC7-16	GCF approved FP108: Transforming the Indus Basin with Climate Resilient Agriculture and Water Management: Only Subcomponent 1.1 - Developing water accounting system	KA added	Developing water accounting system	8	8 districts in Punjab & Sindh provinces
CC7-17	Early Warning System Enhancement Project (EWSEP)	PAK Survey Forms Data Nov 29	Weather Station Installation: PKR 1.04 billion (USD 6.9 million). CC7	20	130 weather stations, 50 flood warning

Example #.

Project name.

Description.

Scale (# districts, ha, etc.)

(“CC7-16” = Cost Category 7, project example #16)

Peeking into Tool: 2 Example: Excel Sheet 3

Example: NAP Agric./Water sector action 2.1:

Using Cost Category #7: "Develop or enhance data collection or monitoring system" - con't:

AltaVerde
Consulting LLC

Cost data are found & shown in
both PKR (not shown here) & in USD

Cost Ex- ample ID	Project Cost Estimate in USD (in 2025)	Project Cost Estimate in USD per unit (in 2025)	Proj ect Cost Note s.	Year of Cost Estimat e (or: Assum e 2023)	Operatio nal Years of Cost Data (eg, 3, 5)	Source Citation: Reference & Year of Budget Document, Project Report etc.
CC7-16	\$10,306,800.00	\$1,288,350.00		2019	6	GCF approved FP108: Transforming the Indus Basin with Climate Resilient Agriculture and Water Management:
CC7-17	5,723,741	\$286,187.05		2020	2020-2025	World Bank. (2020). Early Warning System Enhancement Project.

Peeking inside the Tool: 3

Entering Assumptions of proxy costs & scale for each NAP Action.

AltaVerde
Consulting LLC

Example: NAP Sector 1 Agric./Water, Action 2.1

Excel Sheet 4: Mapping the NAP Actions

"CC7-16" = Cost
Category 7, project
example #16

NAP Action Num ber	Priority Actions or measures under objective <i>NAP text for this action:</i>	Assumptions Made on <u>Implementation</u> and <u>Scaling</u> of Action - to Allow Modeling in Excel Tool	Assumed Scale of NAP Action. (average district Sindh is 6,910 ha)	Cost Example Assumptions to Cost NAP Action
2.1	Upgrade IBIS rehabilitation programs to modernize surface water distribution systems. Key modernization steps will include: Increasing hydraulic control in the secondary distribution system to ensure sufficient delivery to water courses under different flow regimes.	Enhance or develop integrated informatics or monitoring system - in 5 districts in each existing extension service within 4 provinces - Sindh, Balochistan, KP & Punjab. Locations of action: above. Pilot system enhancement in 2 districts & apply to rest once proven.	20 districts total in 4 provinces	average of CC7-16 & CC7-17 - Developing water accounting & mgmt systems = development cost + 3 times that to implement in rest of districts

Project cost examples "CC7-16" & "CC7-17" from Sheet 3 are assumed to be decent proxy costs for this NAP action & entered here

Peeking inside the Tool: 4 Continuation of:

AltaVerde
Consulting LLC

Example: NAP Sector 1, Agric./Water, Action 2.1

Excel Sheet 4: Mapping the NAP Actions

Cost data in PKR & in USD:

NAP Action Number	Cost Case -- Example 1	Cost Case Example 1 -- Cost Estimate	Cost Case Example 2 -- Assumed Multiplier	Cost Case -- Example 2	Cost Case Example 2 -- Cost Estimate	Draft Action Cost Estimate (Cost Example 1 + Cost Example 2 + Cost Example 3) -- Without Standard Additional Costs	Estimated Cost of Action to Pakistan in USD (Net of shared costs)	Estimated Cost of Action to Pakistan in PKR (Net of shared costs)
2.1	CC7-16	\$206,136,000	20	CC7-17	\$114,474,820	\$160,305,410 = average cost of CC7-16 + CC7-17	\$221,221,466	61,499,567,520 = cost of estimate, inflated to 2025

Source of data:

Example CC7-16: GCF approved project FP108: Transforming the Indus Basin with Climate Resilient Agriculture and Water Management, 2019.

Example CC7-17: World Bank. (2020). Early Warning System Enhancement Project.

Excel Sheet 5: adds “Additional standard costs”, & allows varying inflation & uncertainty values

- “Additional Costs” are added to all projects (possible double-counting ignored)

Table x: Standard Additional Costs - Risk, Uncertainty, Gender Inclusion Activities & Monitoring, etc. Costs		
	Default Value Added to All NAP Action Cost Estimates (as % of project cost)	Source
Risk Management Costs		
Price contingencies & exchange rate fluctuations	7.00%	Asian Dev. Bank project default
Physical contingencies	3.00%	Asian Dev. Bank project default
Uncertainty of cost estimate	10.00%	default assumption
Performance delay or efficiency uncertainty	5.00%	default assumption
Standard Project Implementation Costs		
Gender inclusion activities	2.00%	default assumption
Monitoring & evaluation	3.80%	average of 4 WB, GCF projects
Project management cost	7.20%	average of 5 WB, GCF projects
other (add if needed)		
Total additional cost for these risks & activities	38.00%	

- Inflation & uncertainty estimates can be changed (but are not turned on now).

Outline of Final Report

**Final Report: 1) short, graphic Word document,
and 2) Pakistan NAP Excel Tool**

*AltaVerde Consulting
LLC*

Executive Summary	1.5 pages?
I. Pakistan's Vulnerability to Climate Change	1 page?
A: Potential climate change impacts, and adaptation barriers	
II. NAP priority adaptation activities by sector	1 page?
A. Summary of NAP activities, and challenges experienced	
III. Methods used for this analysis	4 pages?
IV. 1st-order estimate of costs of implementing the NAP, by sector	6 pages?
I. Agriculture-water nexus	
II. Natural capital	
III. Urban resilience	
IV. Human capital: A: Health. B: Education	
V. Disaster risk management	
VI. Gender, youth, and social inclusion	
V. Potential next steps	1-2 pages?
A. Implications for setting priorities for resource mobilisation	
Total pages:	15 pages?

VI. Next steps & discussion

Issues in analysis to address over time

Issues Pakistan team may work on:

- Encourage NAP team to define the 117 actions more specifically.
- No convincing estimates possible without deciding what & how many activities are planned in each action.
- Review & improve matching of cost examples with NAP actions
- Review assumptions – critical to NAP action cost estimates
- Decide if need much more formal analysis with team, over time
- Consider identifying highest priorities for seeking funding – unlikely to fund all actions in same timeframe



Potential next steps to consider -

Best way forward on adaptation may be to “Cross the river by feeling the stones,” as Chinese say: one step at a time.

Next step in consultancy: Final Report by Dec. 30

Potential steps for local team:

- Empower small team to review & improve these estimates over next ~6 months?
- Finish developing a NAP Financial Strategy?
 - To identify highest priorities, since 117 actions unlikely to be funded soon or ever.
 - Consider developing “Climate Change Adaptation Investment plans” by sector, offering finer granularity cost estimates.
- Create lean team to provide tech assistance to the most promising proposals?: Great proposals win funding!
 - Analyze donor priorities, application requirements, schedules, financial & technical information needs
 - Set criteria for deciding proposals eligible for assistance.
 - Set goals for funding?: eg, ~ develop 2 GCF or Adaptation Fund proposals, & 4 bilateral proposals by July 1st ??



Potential group discussion topics?

*AltaVerde Consulting
LLC*

- 1) Does this overall approach make sense to you?**
- 2) Are there issues that need to be addressed?**
- 3) Are there other sources of better data, closer to NAP action text descriptions, that should be considered?**
- 4) Does the NAP, in its current form, offer a feasible path forward to implementation of its actions?**
- 5) How can Pakistan's vast human & technical resources be called on to help improve tasks like this one?**

Pakistan NAP Costing Project, Final Report-

ANNEX 1: Key Points from December 10, 2024 Workshop Discussion Groups

Following a presentation by the international consultant to the project, Kenneth Andrasko of AltaVerde Consulting in the USA, five informal discussion groups were created. Each group dialogued for just under an hour, and then presented a summary of the main points they discussed, which are copied in below.

GROUP 1:

1. It is a good approach [the analytic method described in the presentation], however, there is need to have private sector and Provinces and grass root level input
2. It is proposed that the model may facilitate specific projects to be developed for adaptation in costing
3. Model may also consider pilot projects already implemented
4. Identification and prioritization of sectors in terms of funds/allocation [is needed]
5. Need that financial model to be synchronized with conventional financial tools

GROUP 2:

1. Is methodology in line with IPCC's costing methodology?
2. Is the cost estimation based on the current post-COVID scenario, considering the rapid increase in prices?
3. Provincial action plans & climate policies should also be reflected in National Action Plans, both in terms of sectors/cost estimates
4. Terms "Adaptation" & "Mitigation" should be clearly defined
5. Action-wise cost estimation is needed for the whole country.
6. Gap exist in NAP document such as drinking water quality, transportation
7. Current need assessment [could be performed]

GROUP 3:

1. What can be considered as Adaptation Costs and its Activities
2. Stocktaking of data needs
3. Identification of Data type and Forms as per adaptation actions (to be specified as per projects) weightages will have to applied (terrain specific)
4. Provincial stakeholders' engagement
5. Data validation by PBS (Govt certification)

GROUP 4:

1. Leveraging stakeholders including finance, planning, Provincial sector experts and others.
2. Financial interventions (Ministry of Finance, MoPDSI) aligned with NAP vulnerable sectors interventions/actions (yearly budget, PSDP, ADPs) tagging to remove duplication
3. Realistic cost estimated at the unit level for prioritized actions (GCICS indicators, dynamic inflation factor)
4. Using available national expertise to expand the pool of experts for further cascading
5. Analytical tools (NAD Tool) to be shared

GROUP 5:

A. HUMAN RESOURCES

- **Issues**
 - a. Institutional Arrangements, Capacity Building, Hiring Process
 - b. Transparency & Coordination, HR Plans
 - c. Frequent Tenures/Transfers
 - d. Gender Diversity
- **Goal**

A socially inclusive, holistic, coordinated and consistent HR Plans at all government level
- **Way Forward**
 - 1. Development of working group of technical experts
 - 2. Revamping of the current institutional arrangements
 - 3. Integration of local and international best practices
 - 4. Responsive on-boarding (smooth transition)
 - 5. Diverse culture and indigenous knowledge consideration

B. TECHNICAL RESOURCES

- **Issues**
 - a. Accessibility
 - b. Computational Resources
 - c. Technical expertise/literacy
 - d. Financial issues
 - e. Lack of central repository platform
- **Goal**

A robust, centralized, digital, technology transfer mechanism at all government levels
- **Way Forward**
 - 1. Enhanced diplomacy & advocacy to tap just global finance and technology
 - 2. Consistent TOTs [training of trainers] by opting skill-based approach
 - 3. Add mandatory consensus about contemporary advancements at key level
 - 4. Centralized knowledge sharing and reporting mechanisms