Supplementary figures

Wetlands

	WATER INDICATORS						PARAMETERS									
ARTICLES REVIEWED	FLOOD PEAK	RUNOFF	WATER RETENTION CAPACITY	GW RECHARGE	WATER STORAGE	SOIL EROSION	INFILTRATION	SOIL	SIZE ANALYSIS	SLOPE	PRECIPITATION	ETP	INTERCEPTION	COMBINATION OF NBS	CLIMATE CHANGE ANALYSIS	COMMENTS
VALENCIA-LEGUIZAMÓN ET AL. (2017)									32 ha 343 ha		2600 mm/y		120 mm/y 62 mm/y		N	
CARLSON ET AL. (2020)									Between 3 ~5000 m2		Snowpack source				N	
LI & SHI (2015)									7 452.67 km2 5 191.85 km2		270 - 410 mm/y				Y	
LI ET AL. (2014)		20 - 36 %					▲		5 479 km2 7 941 km2						Y	
PULIDO-BOSCH ET AL. (2000)	21%						165 mm/h 10% of P		320 km2		200 mm/y			Infiltration ditches	N	
MOSQUERA ET AL. (2015)		55 - 70% of P	90% of P			▼	High		Between 0.20 ~7.53 km2	Between 14 ~ 24%	900 - 1600 mm/y	Between 413 ~ 580 mm/y			N	Runoff increases as the size of the catchment area increases
CAO ET AL. (2020)									4 500 km2		400 mm/y	324.96 ~ 362.1 mm/y			N	
YANG ET AL. (2023)		74%							20 930 km2		326.4 mm/y	325.2 mm/y			Y	The runoff generation is primarly dominated by its ful storage (Zhu et al. 2022a).
LI ET AL. (2013)			Related with microtopography						31 km2						N	
SHIH & LEE (2023)									2 500 ~ 5 000 m2		5175 mm/y				N	
XU ET AL. (2009)									11 957 km2						N	
WANG ET AL. (2022)								Soil water content limit the ET			315 mm/y	652.5 mm/y			N	
SCHELIGA ET AL. (2019)									0.08 ~ 5.7 ha	From 11° ~ 21°	1100 mm/y	400 mm/y			N	Micro-topography efficiently buffered rainfall
MAPESHOANE & VAN HUSSTEEN (2016)									23.1 ha		1510 mm/y				N	
THOMPSON ET AL. (2012)								Sandy loam	0.4 ~ 0.9 ha						Y	Precipitation is the main source
PITCHFORD ET AL. (2012)						▼▲			4 565 km2		840 ~1416 mm/y				Y	Topographic depressions receive water inputs from precipitation and runoff
PRICE ET AL. (2005)	Watershed size		Soil-water storage capacity is low and near-surface runoff during storm events											Artificial terraces	N	Topographically high ponds act as focal points for recharge
SUN ET AL. (2002)		75%			▼▲			Sandy soils at this site have fairly low water holding capacity	140 ha / 61 ha	<2% / 49%	1400/1876 mm/y	1431/913 mm/y		Forest conservation	N	The general perception that wetlands always have 'flooding control' functions is not accurate. One must consider the antecedent soil moisture conditions when evaluating wetland hydrologic functions.
SHIH & HSU (2021)	Between 0.135 ~0.194 m3/s							Infiltration rate: 0.2~2.28 cm/h	10.9 ha		4000 mm/y	467 mm/y			N	
FREI ET AL. (2010)																Microtopography can attenuate and delay surface flows, because surface depressions need to be filled until a specific surface water storage threshold is exceeded and surface flow towards the stream channel can be initiated.
OTTO & GIBBONS (2017)									140 000 km2		200 ~1000 mm/y				Y	Wetlands in arid conditions are at more at risk due to Climate Change
AHMAD ET AL. (2020)					▲ ~30.9 km3				390 km2	Flat bathymetry of the haors in the basin					N	
SHAO ET AL. (2022)									21.75 km2		1210 ~ 1780.2 mm/y	762.3 ~ 990.1 mm/y			N	Annual ET tended to increase as the fraction of water cover increased
CARLSON ET AL. (2014)				2.5 ~4.4 mm/d	▼ Wet conditions				560 ha						Y	
DWIRE ET AL. (2017)				▲											N	
COOPER ET AL. (2015)				▲ 5 ~ 80% of P				1) Hydraulic conductivity = 5.8m/d 2) Specific yield = 0.35	5.69/7.03 ha						N	
RUDOLPH ET AL. (2007)															N	More related about the monitoring methodology
WANG ET AL. (2012)											740 mm/y				N	Nexus between wetlands and evapotranspiration
CERVANTES ET AL. (2021)		▲▼		▲ 17% of P 211 mm/y				Soil moisture = 76.2% Porosity = 72.4%	875 ha	Reduced slope that reduces surface runoff and facilitates infiltration	1290 mm/y	765 mm/y	25.8 mm/y	Forest conservation	N	ETP = main water loss from the ecosystem. When the ecosystem is saturated, it loses its infiltration capacity.
MONGE-SALAZAR ET AL. (2022)								SOC = 22%			200 - 590 mm/y			Diversion canals and grassland	N	Evidence suggests that agropastoralist communities have implemented these practices for the last 500–1000 years (Lane, 2006)
COTTET ET AL. (2013)															N	Social perception
BAIKER ET AL. (2022)		▼							50 ha	< 5%	550 mm/y			Diversion canals	Y	Larger wetland area: better capacity to buffer high water discharges

Figure S1: Main information and data of Wetlands studies.

Agroforestry

	WATER INDICATORS					PARAMETERS									
ARTICLES REVIEWED	FLOOD PEAK	RUNOFF	WATER RETENTION CAPACITY	GW RECHARGE	SOIL EROSION	INFILTRATION	SOIL	SIZE ANALYSIS	SLOPE	PRECIPITATION	ETP	INTERCEPTION	COMBINATION OF NBS	CLIMATE CHANGE ANALYSIS	COMMENTS
CASTELLI ET AL. (2017)		▼ 11 % 14.65 mm		▲ 3% 0.19 mm				3955 km2	Landscape is wavy with steep slopes	974 mm/y	550 mm/y		Afforestation	N	
DENU ET AL. (2016)										1500 – 2200 mm/y				N	
JIAO ET AL. (2024)			• Forest 1.28x10^3 m3/ha • Grassland 1.1*10^3 m3/ha		• Forest 3.43*10^2 t/ha • Grassland 2.23*10^2 t/ha			16 768 ha	66°	540.5 mm/y			Terraces	N	
ZUAZO ET AL. (2011)		▼ 1 year: SV (-70%) La (-71%) Th (-88%) 2 year: SV & TV (-94& & - 83%) Ro (-26%)			▼ Compared to bare soil, Th & Sv reduced 71% and 79% & Sa reduced 39%		Loamy sand		Steeper than 30% Another value given is 214%	449 mm/y			Terraces	N	Soil erosion results: Sa > An > Ro > Th > Sv > La = 18.0 > 13.5 > 13.4 > 6.5 > 4.4 > 3.2 Mg.ha− 1.yr− 1 Runoff results: Ro > Sa > An > Th = La > Sv 41.7 > 38.2 > 35.5 > 16.9 > 16.1 > 12.4 mm/y

Figure S2: Main information and data of Agroforestry studies.

Afforestation

	WATER INDICATORS					PARAMETERS									
ARTICLES REVIEWED	FLOOD PEAK	RUNOFF	WATER RETENTION CAPACITY	GW RECHARGE	SOIL EROSION	INFILTRATION	SOIL	SIZE ANALYSIS	SLOPE	PRECIPITATION	ETP	INTERCEPTION	COMBINATION OF NBS	CLIMATE CHANGE ANALYSIS	COMMENTS
CASTELLI ET AL. (2017)		▼ 11 % -14.65 mm		▲ 3% +0.19 mm				3955 km2	Landscape is wavy with steep slopes	974 mm/y	550 mm/y			N	
GALLAY ET AL. (2021)		▼ Forest: - 60 ~ 90% runoff Orchards: - 40 ~ 70% runoff Grassland: - 40 ~ 70%	▲ Orchards: 72~82% of Forest retention Grassland: 64~76% of Forest retention				Loam and sandy loam soil	291.7 ha		780 ~ 1150 mm/y		Ecosystems affect water balance mainly through two processes: interception and infiltration.		N	Coniferous forests occupy the highest parts of the area and deciduous forests cover only the lowest part of the basin.
LIANG ET AL. (2023)		▼	▲		Values of soil conservation: 77.7 t/km2; 139.8 t/ km2; 259.5 t/km2; 441.9 t/km2; and 535.4 t/km2				Slope (contribution = 68.5%; p < 0.01) was the most important factor influencing the relationship between ESs and ESs, and had a strong impact on ESs in areas with rainfall greater than 600–700 mm.	445 ~973 mm/y	Influence Water yield and soil conservation		Forest conservation	Y	Slope has a strong relationship for runoff velocity, alter infiltration, and positive correlation with erosion rates
LI ET AL. (2023)		▼	▲	▼						200 ~750 mm/y		RI = 43.8 +/- 27.1 mm P effective = 415 mm/y		Y	Ecological construction practices in arid and semiarid regions can benefit from the successful greening experience of the GFGP in the LP but should also learn lessons from unsustainable greening in areas with relatively abundant water.
BUENDIA ET AL. (2016)		▼ 17 ~27% reduction						2807 km2		1123 - 1050 - 1003 mm/y	580 - 709 - 648 mm/y	Afforestation is a common phenomenon in Mediterranean headwaters, increasing evapotranspiration and water interception by vegetation		Y	Paper evaluates the proportion of streamflow change that can be attributed to climate and land use change
HRABOVSKY ET AL. (2020)				▼		▼	The infiltration rate under near-saturated conditions was significantly lower in the afforested soil than in the vineyard			600 ~700 mm/y				N	Paper assumes that an increase in carbon content from land-use change affects the physical processes of soil that depend on soil–water interactions, i.e., infiltration, surface runoff, and erosion.
CHEN ET AL. (2016)			▲				Increase in soil water content between 45% and 70%			400 mm/y				N	The conversion of natural and semi-natural grasslands to forests resulted in a decrease in species richness and diversity
PEREIRA (1967)						▲								N	Literature review
PIEGAY ET AL. (2004)	▼ Decrease of peak flow frequency			▲				194 km2						N	
MARTÍNEZ-RETURETA ET AL. (2022)		▲ 0.2% – 14.1%		▼ 15% - 10.1%						1253 ~ 2693 mm/y	▲ 2.4% and 4.2%			Y	It could be considered that the massive conversion of LUs from native forests, to both fast-growth exotic plantations and agriculture, occurred in the study area could lessen soil infiltration capacity, thereby causing a high percentage of rainwater to turn into surface runoff
ESQUIVEL ET AL. (2020)		▼ Water flow regulation declined 84.4%								1600 mm/y				N	68% of the landscape was covered by native forest in 1986, being reduced to 50% in 2011. Moreover, 13% of the subwatersheds were affected by afforestation with exotic tree species in agricultural lands.
MARTÍNEZ-RETURETA ET AL. (2020)		▲ 3.43%		▼ 2.37%		▼ 15.57%				1250 mm/y	▲ 4.21%			N	Exotic forest plantations as the prevailing land use in the river basin was the one with the highest increasing percentage—28.64% between 1986 and 2011. The native forests and scrublands had a decreasing showing a reduction of 13.47% from 1986 to 2001 and a 30.70% decrease from 1986 to 2011
RODRÍGUEZ-ECHEVERRY ET AL. (2018)		▼ decrease water supply in 11 %			▼ decrease erosion control 346%					2293 mm/y				N	The study shows that the changes in the spatial patterns of the diversity of native forest habitat were strongly linked to a decrease in the provision of the ecosystem services from 1986 to 2011

Figure S3: Main information and data of Afforestation studies.

Reforestation

	WATER INDICATORS					PARAMETERS									
ARTICLES REVIEWED	FLOOD PEAK	RUNOFF	WATER RETENTION CAPACITY	GW RECHARGE	SOIL EROSION	INFILTRATION	SOIL	SIZE ANALYSIS	SLOPE	PRECIPITATION	ETP	INTERCEPTION	COMBINATION OF NBS	CLIMATE CHANGE ANALYSIS	COMMENTS
KIM ET AL. (2019)		●	●						> 15 degrees				Forest conservation	N	
KABEJA ET AL. (2020)	▼ Decrease 6 ~14% Peak discharge difference between - 54 to - 720 m3/s			▲				578 km2 and 7 724 km2	0 ~ 44%	495 ~ 1600 mm/y			Forest conservation	N	The two catchments have undergone changes in land cover at different degrees in the last 25 years, and hence, serve as ideal sites to evaluate the impact of reforestation induced land use change on flash flood peak discharge.
HOLDEN ET AL. (2022)		▼						78 ~ 46 km2		2253 ~ 1648 mm/y	4.1 mm/day		Forest conservation	Y	IATs are a major threat to water security especially in the Western Cape of South Africa and for Cape Town's water supply. Moreover, IATs alter vegetation water use characteristics in ways that reduce runoff and decrease groundwater recharge.
GAO & YU (2017)		▼			▼			1270.6 km2		1850 ~ 3740 mm/y				N	This study intends to explore how changes in landscape composition and configuration impact the hydrological service of tropical watersheds in the Caribbean region.
GHIMIRE ET AL. (2013)		▼ Reduces between 2.7 to 18%		▲		▲	Hydraulic conductivity: Degraded pasture (39 mm/h) - Footpath (24 mm/h) - Pine Forest (63 mm/h) - Natural Forest (115.4 mm/h)		20° ~25°	1487 mm/y	1170 mm/y	Degraded Pasture (0 mm/y) - Pine Forest (149 mm/y) - Natural Forest (189 mm/y)		N	The present results further illustrate the positive influence of a well-developed litter layer and understory vegetation on surface and subsurface hydrological functioning
MOLINA ET AL. (2009)		▼			▼ Soil storage between 1 ~ 53%			287 ~1009 m2	14 ~56 %	800 ~1000 mm/y				N	Data indicate that vegetation plays a key role in controlling sediment deposition in steep gully beds

Figure S4: Main information and data of Reforestation studies.

Forest Conservation

	WATER INDICATORS					PARAMETERS									
ARTICLES REVIEWED	FLOOD PEAK	RUNOFF	WATER RETENTION CAPACITY	GW RECHARGE	SOIL EROSION	INFILTRATION	SOIL	SIZE ANALYSIS	SLOPE	PRECIPITATION	ETP	INTERCEPTION	COMBINATION OF NBS	CLIMATE CHANGE ANALYSIS	COMMENTS
KIM ET AL. (2019)		●	●						slope higher than 15 degrees				Reforestation	N	
HOLDEN ET AL. (2022)		▼						78 - 46 km2		2253 - 1848 mm/y	4.1 mm/day		Reforestation	Y	IATs are a major threat to water security especially in the Western Cape of South Africa and for Cape Town's water supply. Moreover, IATs alter vegetation water-use characteristics in ways that reduce runoff and decrease groundwater recharge.
LIANG ET AL. (2023)		▼	▲				Larger slope enhance the possibility for runoff generation (Hümann et al., 2011; Balasubramanian , 2017), increase the scouring force on the soil surface (Emmett, 1968), and change the relationship between WY and SC from synergy to trade-off		Slope (contribution = 68.5%; p < 0.01) was the most important factor influencing the relationship between ESs and ESs, and had a strong impact on ESs in areas with rainfall greater than 600–700 mm.	445 - 973 mm/y	WY and SC are significantly influenced by slope, temperature and potential evapo transpiration		Afforestation	Y	Precipitation relationship
VONHEDEMANN (2023)					Importance of communal lands in natural resource conservation, particularly for protection of watershed services, erosion control, and biodiversity (Katz 2000; Elias et al. 2008).									N	More social approach of the research
WANG ET AL. (2023)			▲ ▼ Depending of ETP Also, strong water conservation capacity reduce the groundwater loss risk	Limited by water conservation capacity		Infiltration limited		16410 km2		450 ~800 mm/y	Excessive evapotranspiration reduce water conservation			N	The paper determined that precipitation, evapotranspiration, and runoff, are the main factors affecting water conservation service supply.
SUN ET AL. (2002)	Under wet antecedent soil moisture condition, watershed size will play a critical role in determining peak flow rate and volume as well.	▼ Reduction of 75%	Water conservation service supply was higher on the cropland and grassland.				Sandy soil with low water holding capacity	61 ha ~ 140 ha	<2.0 - <0.2 - 40%	1400 mm/y - 1340 mm/y - 1876 mm/y	1431 mm/y - 1133 mm/y - 913 mm/y	Lower canopy interception loss	Wetlands	N	
TIWARI ET AL. (2009)		▼ 6.7% ~ 11.3%			▼ reduction of 30% ~ 85% Soil losss avg - 0.04 Mg/ha	Forest soil (5-8 cm/h)	Sandy loam	8 km2	33%	1202 mm/y			Terraces	N	
CERVANTES ET AL. (2021)		Flow regulation 3% and 24.2 % of P was runoff		15.4% of P was recharged to groundwater (198 mm/y)			Moisture (50.3%) Porosity (56.4%)	875 ha	Reduced slope	1290 mm/y	596 mm/y	122 mm/y	Wetlands	N	
ŠACH ET AL. (2014)	A reduction of the peak flow of flash floods by forest complexes depends mainly on the quality of forest soil	▼ Reduce between 18% ~52%	Retention in forest soil 78.3 % of precipitation			1~10 mm/min		Small catchments		119.4 mm/y		150 mm/y	Reforestation	N	Literature review paper

Figure S5: Main information and data of Forest Conservation studies.

Diversion canal

	WATER INDICATORS					PARAMETERS									
ARTICLES REVIEWED	FLOOD PEAK	RUNOFF	WATER RETENTION CAPACITY	GW RECHARGE	SOIL EROSION	INFILTRATION	SOIL	SIZE ANALYSIS	SLOPE	PRECIPITATION	ETP	INTERCEPTION	COMBINATION OF NBS	CLIMATE CHANGE ANALYSIS	COMMENTS
JÓDAR ET AL. (2022)		▼ Delaying transit time	▲ 3.66 Hm3 of watershed hydrological recharge (70% of the river flow)	▲ 48% of the river		9.32L/s/km - 20.2 L/s/km - 88 L/s/km			Slopy mountain					N	The careo channels may become an adaptation measure to climate change
FROT & VAN WESEMAEL (2009)		▼ Around 70% of runoff volume in the aljibes was collected during saturated conditions	▲			Infiltration rate = Bare soil = 22.5 - 38.3 - 37.7 mm/h Vegetation infiltration rate = 187 - >55 - 54.1 mm/h	Precipitation and soil moisture content are directly linked and hence 80% of the storms appeared during moderate to saturated condition	Between 4 142 m2 to 60 021 m2	12 – 35 %	270 – 714 mm/y	70% of the precipitation		Water storage systems	N	Their effectiveness seems to depend on their land cover and spatial arrangement of units prone to produce runoff
YAIR (1983)		▲ The runoff coefficient was estimated as 15–20 per cent of the annual precipitation.		▼		41 mm/h	Determinant role of soil for this ancient technique of water harvesting	0.1 - 0.3 ha	27.4% - 28.3% - 27%	75 ~ 100 mm/y				N	
PULIDO-BOSCH ET AL. (2000)						10% of maximum precipitation 2 ~1000 mm/h		320 km2		200 mm/y			wetlands or infiltration ditches; dams	N	
OCHOA-TOCACHI ET AL (2019)		▲ Increase of runoff in dry season between 3% ~554% and increase of runoff on Rimac basin of 33% on dry season Flow diversion = 54% of runoff						2.09 km2 and 1.69 km2 Rimac river basin = 2 319 km2		437 ~ 563 mm/y			Infiltration hillslopes	N	Globally, the sustainability of mountain water resources is threatened by a variety of processes including soil degradation, land use change, changing precipitation patterns, and accelerated glacier melt
BAIKER ET AL. (2022)		▼						50 ha	> 50%	550 mm/y			Wetlands	N	Canals divert water from the slopes for irrigation of the wetland.

Figure S6: Main information and data of Diversion canal studies.

Infiltration trenches

	WATER INDICATORS					PARAMETERS									
ARTICLES REVIEWED	FLOOD PEAK	RUNOFF	WATER RETENTION CAPACITY	GW RECHARGE	SOIL EROSION	INFILTRATION	SOIL	SIZE ANALYSIS	SLOPE	PRECIPITATION	ETP	INTERCEPTION	COMBINATION OF NBS	CLIMATE CHANGE ANALYSIS	COMMENTS
CASTELLI ET AL. (2017)		▼ Flow reduction due to rainwater harvesting			▼	▲ Increase infiltration rate		2 750 km2	High slope	813 mm/y			Terraces	N	
LI & GAO (2019)		▲▼		▲ Enhance pipe (or macropore) flow during the dry season			Hydraulic conductivity (10^-5 k) cm/s avg = 1.66	22 145 km2	Gentle from 0.048 to 0.070	684 ~659 mm/y	485 ~498 mm/y		Peatlands	N	Nonetheless, it is still unclear how gullies and ditches affect groundwater by altering hydraulic conductivity and head within the peat layer
LAFEVOR & RAMOS-SCHARRON (2021)		▼ 0.08 % decrease of runoff in average				▲ Infiltration capacity of trench = 38.43 mm/h		5.32 km2	0.0975 m/m	400 ~1200 mm/y				N	This study suggests that infiltration trenching in mountain protected areas first requires careful assessment of environmental factors and precipitation-runoff relationships to ensure trenches are necessary
GUZMAN ET AL. (2017)		▼ In a short term, 10% decrease in runoff of annual discharge			▼ Annual sediment yields reduce between 5.9 – 16.5 t/ha	Effective infiltrating rain wate	Soil moisture storage and soil profile are the main important factors considering the infiltration capacity of the soil	1.13 km2	Steep denudation slopes	1690 mm/y			Terraces	N	
SOMERS ET AL. (2017)		▼ 23 L/s	Interception storage = 1 mm	▲ Effectivenes = 3.5% For current trenching conditions, the maximum increase in groundwater contribution is 1.3 L/s (112,300 L/day)		▲ 3.7% 83.3% of precipitaion is infiltration Infiltration capacity = 0.2 m/day	Unconsolidated silty sand and gravel glacial and fluvial deposits	10.4 km2	Steep alpine grassland	800 mm/y	0~18 mm/day			N	The sensitivity analysis indicated that infiltration trenches provided different benefits depending on the environment. Most notably, trenches are most effective in areas with low infiltration capacity and therefore more surface flow than the trenches can intercept, provided that the trench density and infiltration capacity are high enough to accommodate all the surface flow generated without additional runoff. This is in contrast to MAR systems, which require high infiltration capacities to function (Bouwer, 2002).
LOCATELLI ET AL. (2020)		▼ 46.4%				Not many studies on the significant effect of infiltration in ditches.								N	Literature review

Figure S7: Main information and data of Infiltration trenches studies.

Terraces

	WATER INDICATORS					PARAMETERS									
ARTICLES REVIEWED	FLOOD PEAK	RUNOFF	WATER RETENTION CAPACITY	GW RECHARGE	SOIL EROSION	INFILTRATION	SOIL	SIZE ANALYSIS	SLOPE	PRECIPITATION	ETP	INTERCEPTION	COMBINATION OF NBS	CLIMATE CHANGE ANALYSIS	COMMENTS
CASTELLI ET AL. (2017)		▼			▼	▲	Increase of soil moisture	2 760 km2	High slope	813 mm/y			Infiltration trenches	N	The objective of the works was to stabilize upstream hillside areas to prevent land degradation and erosion
PARONUZZI & BOLLA (2023)			▲			▲	T1 = sandy (74-78%) silt (18-21%) T2 ~ T5 = from blocks to silty loam T2 = silt (46-54%) and clay (54-46%) T3 = silty fraction and clay, sand and gravel		30 ~ 45 degrees	1719 mm/y				N	
LIU ET AL. (2022)				▲ Fed by precipitation and groundwater				13.92 km2	Steep slopes	1537.18 mm/y			Agricultural tilling	N	
BECKERS ET AL. (2012)			▲			▲ Forced infiltration and storage of the water in the terrace fills.	The fills are composed of unconsolidated fluvial silts and sands and occasional embedded gravel layers.		between 1° and 10°.	180 ~ 300 mm/y				N	
LLORENS ET AL. (1992)		▼ Runoff produced is infiltrated when it reaches the terraced area if this is not saturated enough.	▲ High retention capacities		▼ Reduces 95.1% Retains 58 T/y	▲ High infiltration		36 ha	10 ~30%	851 mm/y				N	
ZHAO ET AL. (2023)		▼			The sediment content of NDT was 1.10-3.02 times higher than that of LT, 4.17-17.25 times higher than that of DT, and the sediment content of LT is 2.51-11.13 times higher than that of DT		Moisture content = 12% Dry density = 1.4 g/cm3	4.86x10^5 ha	Above 40°	Rain intensity - Spring (33.2 - 29.2 - 83.2 mm/d); Summer = 118.24 - 90.72 mm/d; Fall = 29.2 mm/d			Drainage	N	The purpose of this study is to explore the impact of different engineering measures for GCHP on runoff and sediment yield on a multispatiotemporal scale
GALLART ET AL. (1994)		▲ Terraces could also increase the runoff coefficient with the formation of man-induced saturated areas.	▲		▼ Because of stabilization.		Saturated hydraulic conductivity = 306 mm/h (surface) Low permeability	36 ha	10-30%	850 mm/y			It is usual to drain, by man-made ditches, such frequently saturated areas to limit their growth and to prevent uncontrolled runoff across the terrace system.	N	
TIWARI ET AL. (2009)		▼ Reduction runoff in 11.3% in Single terraces and 6.7% in double terraces			▼ Erosion rates dropped to near zero as surface cover approached 100%	12-14 cm/h	SOC % ST 2.49 - DT 2.29	6 km2	11 - 12 %	1202 mm/y			Forest conservation	N	
WANG ET AL. (2024)							Low permeability of the soil	0.067 km2		1500 mm/y				N	
BRUINS ET AL. (2020)			Based on runoff water captured			Captured water infiltrates very slowly, due to surface crust formation on the loessial soils		2751 m2		100 mm/y				N	
ZHAN ET AL. (2011)		▼ Between 16.77 to 25.25%								650 ~ 850 mm/y				N	
HUANG ET AL. (2024)				▲ Irrigation has the potential to recharge groundwater from the andesitic layer.						2800 mm/y				N	The study aimed to visualize the trend of changes in subsurface water in terraced paddy fields and determine the occurrence of subsurface return flow based on the water distribution change (abandoned terrace)
GUZMAN ET AL. (2017)		▼ In a short term, 10% decrease in runoff of annual discharge		▲	▼ Annual sediment yields reduce between 5.9 - 16.5 t/ha			1.13 km2	Steep denudation slopes	1690 mm/y			Infiltration trenches	N	Measures are being taken to reduce erosion but only in a few cases have they been checked for their effectiveness
WEI ET AL. (2024)			▲ Implying that the terraces function as a source of water conservation. Linked with the topography.	▲	▼ For irrigated terraced agriculture in semi-arid areas, the construction of terraces can effectively improve the soil erosion phenomenon of sloping arable land		Pore aquifers (clayey soil) and bedrock (rocky body) weathering fissure aquifers	13.92 km2	17° - 58°				Agricultural systems	N	Terrace increase the residence time of rainwater on the ground, and improve the infiltration of soil moisture
HERATH ET AL. (2015)				▲				0.344 km2						Y	This study aims to assess the hydrological response of the selected study site in the Ifugao Rice Terraces to climate change
JIAO ET AL. (2024)			1.39*10^3 m3/ha		▼ Soil retention = 1.66*10^3 t/ha			2 765 ha	66°	540.5 mm/y			Agroforestry + water storage and irrigation + tillage	N	

Figure S8: Main information and data of Terraces studies.

Small reservoirs

	WATER INDICATORS					PARAMETERS									
ARTICLES REVIEWED	FLOOD PEAK	RUNOFF	WATER RETENTION CAPACITY	GW RECHARGE	SOIL EROSION	INFILTRATION	SOIL	SIZE ANALYSIS	SLOPE	PRECIPITATION	ETP	INTERCEPTION	COMBINATION OF NBS	CLIMATE CHANGE ANALYSIS	COMMENTS
JIAO ET AL. (2024)		▼	▲		▼		The bedrock under the soil has a relatively low soil-retention capacity, thus the soil is easily washed away, which has resulted in a thin and discontinuous soil layer.		66°	540.5 mm/y			Terraces	N	Reservoirs are the central part of the ecological water network in mountainous areas and serve such functions as protecting against floods and storing water.
CRAIG ET AL. (2011)			▲ How it is possible to store water in these ponds for extended periods of time without loss of water through percolation remains unspecified by previous descriptions of qochas				Lacustrine clays deposited	682 km2					Terraces	N	
LANE (2014)		▼ Greater control of annual flood and rainfall waters	▲ It acts as an aquifer in which water is both stored and purified through the soil				Basaltic andesite which is a relatively hard, though brittle rock with limited porosity						Wetlands and terraces	N	
GUYASSA ET AL. (2017)	▼ Reduction between 8–17%	▼ Reduction between 8-18		▲	▼	▲	Sandy clay loam		Steep slopes	550 ~900 mm/y				N	The result of this study indicates that implementation of check dams in gullies will have a considerable effect on catchment hydrology by increasing infiltration which then improves groundwater recharge and base flows.
SOOMRO, A.G. ET AL. (2022)			▲							150 ~ 250 mm/y	2000 ~ 2100 mm/y			N	

Figure S9: Main information and data of Small reservoirs studies.

ARTICLES REVIEWED	NUMERICAL/HYDROLOGICAL MODELING	EXPERIMENTAL/IN SITU METHODS	GIS AND REMOTE SENSING METHODS	STATISTICAL METHODS/DATA ANALYSIS
VALENCIA-LEGUIZAMÓN ET AL. (2017)	▲	★		
CARLSON ET AL. (2020)		★		
LI & SHI (2015)				■
LI ET AL. (2014)	▲			
PULIDO-BOSCH ET AL. (2000)		★		
MOSQUERA ET AL. (2015)		★		
CAO ET AL. (2020)		★	●	
YANG ET AL. (2023)	▲	★		
LI ET AL. (2013)			●	
SHIH & LEE (2023)	▲	★		
XU ET AL. (2009)		★		
WANG ET AL. (2022)	▲	★	●	
SCHELIGA ET AL. (2019)		★		
MAPESHOANE & VAN HUSSTEEN (2016)		★		
THOMPSON ET AL. (2012)		★		
PITCHFORD ET AL. (2012)	▲			
PRICE ET AL. (2005)				
SUN ET AL. (2002)	▲	★		
SHIH & HSU (2021)	▲	★		
FREI ET AL. (2010)	▲			
OTTO & GIBBONS (2017)			●	
AHMAD ET AL. (2020)			●	
SHAO ET AL. (2022)		★		
CARLSON ET AL. (2014)	▲	★		
DWIRE ET AL. (2017)				■
COOPER ET AL. (2015)	▲			
RUDOLPH ET AL. (2007)	▲	★		
WANG ET AL. (2012)	▲			
CERVANTES ET AL. (2021)	▲	★		
MONGE-SALAZAR ET AL. (2022)		★		■
COTTET ET AL. (2013)				
BAIKER ET AL. (2022)		★		

Figure S10: Modelling and analytical approaches of Wetlands studies.

Agroforestry

ARTICLES REVIEWED	NUMERICAL/HYDROLOGICAL MODELING	EXPERIMENTAL/IN SITU METHODS	GIS AND REMOTE SENSING METHODS	STATISTICAL METHODS/DATA ANALYSIS
CASTELLI ET AL. (2017)	▲			
DENU ET AL. (2016)		★		
JIAO ET AL. (2024)	▲	★	●	
ZUAZO ET AL. (2011)		★		■

Afforestation

ARTICLES REVIEWED	NUMERICAL/HYDROLOGICAL MODELING	EXPERIMENTAL/IN SITU METHODS	GIS AND REMOTE SENSING METHODS	STATISTICAL METHODS/DATA ANALYSIS
CASTELLI ET AL. (2017)	▲			
GALLAY ET AL. (2021)	▲		●	
LIANG ET AL. (2023)	▲			
LI ET AL. (2023)	▲		●	
BUENDIA ET AL. (2016)	▲			
HRABOVSKY ET AL. (2020)		★		
CHEN ET AL. (2016)		★		
PEREIRA (1967)	-	-	-	-
PIEGAY ET AL. (2004)		★		
MARTÍNEZ-RETURETA ET AL. (2022)	▲	★		
ESQUIVEL ET AL. (2020)	▲	★		
MARTÍNEZ-RETURETA ET AL. (2022)	▲			
RODRÍGUEZ-ECHEVERRY ET AL. (2018)	▲	★		

Reforestation

ARTICLES REVIEWED	NUMERICAL/HYDROLOGICAL MODELING	EXPERIMENTAL/IN SITU METHODS	GIS AND REMOTE SENSING METHODS	STATISTICAL METHODS/DATA ANALYSIS
KIM ET AL. (2019)	▲			
KABEJA ET AL. (2020)	▲		●	
HOLDEN ET AL. (2022)	▲	★		
GAO & YU (2017)				
GHIMIRE ET AL. (2013)		★		■
MOLINA ET AL. (2009)	▲	★		

Forest Conservation

ARTICLES REVIEWED	NUMERICAL/HYDROLOGICAL MODELING	EXPERIMENTAL/IN SITU METHODS	GIS AND REMOTE SENSING METHODS	STATISTICAL METHODS/DATA ANALYSIS
KIM ET AL. (2019)	▲	★		
HOLDEN ET AL. (2022)	▲	★		
LIANG ET AL. (2023)	▲			
VONHEDEMANN (2023)	-	-	-	-
WANG ET AL. (2023)	▲		●	
SUN ET AL. (2002)	▲	★		
TIWARI ET AL. (2009)		★		
CERVANTES ET AL. (2021)	▲			
ŠACH ET AL. (2014)	-	-	-	-

Figure S11: Modelling and analytical approaches of Forest-based studies.

Diversion canal

ARTICLES REVIEWED	NUMERICAL/HYDROLOGICAL MODELING	EXPERIMENTAL/IN SITU METHODS	GIS AND REMOTE SENSING METHODS	STATISTICAL METHODS/DATA ANALYSIS
JÓDAR ET AL. (2022)	-	-	-	-
FROT & VAN WESEMAEL (2009)	▲	★		
YAIR (1983)		★		
PULIDO-BOSCH ET AL. (2000)		★		
OCHOA-TOCACHI ET AL (2019)	▲	★		
BAIKER ET AL. (2022)		★		

Infiltration trenches

ARTICLES REVIEWED	NUMERICAL/HYDROLOGICAL MODELING	EXPERIMENTAL/IN SITU METHODS	GIS AND REMOTE SENSING METHODS	STATISTICAL METHODS/DATA ANALYSIS
CASTELLI ET AL. (2017)		★		
LI & GAO (2019)		★		
LAFEVOR & RAMOS-SCHARRON (2021)	▲	★		
GUZMAN ET AL. (2017)	▲			
SOMERS ET AL. (2017)	▲	★		
LOCATELLI ET AL. (2020)	-	-	-	-

Terraces

CASTELLI ET AL. (2017)		★		
PARONUZZI & BOLLA (2023)	▲	★		
LIU ET AL. (2022)	▲	★		
BECKERS ET AL. (2012)		★		
LLORENS ET AL. (1992)		★	●	
ZHAO ET AL. (2023)		★		
GALLART ET AL. (1994)	▲	★	●	
TIWARI ET AL. (2009)		★		
WANG ET AL. (2024)		★		
BRUINS ET AL. (2020)			●	
ZHAN ET AL. (2011)	-	-	-	-
HUANG ET AL. (2024)		★		
GUZMAN ET AL. (2017)	▲	★		
WEI ET AL. (2024)	▲	★		
HERATH ET AL. (2015)	▲	★		
JIAO ET AL. (2024)		★	●	

Small reservoirs

JIAO ET AL. (2024)		★	●	
CRAIG ET AL. (2011)	▲	★	●	
LANE (2014)	-	-	-	-
GUYASSA ET AL. (2017)		★		
SOOMRO, A.G. ET AL. (2022)	▲		●	

Figure S12: Modelling and analytical approaches of Water harvesting based studies.