

## Supplementary Information

**Table S1.** Localized SDG indicators (SDGs 1-4, 6-11) for Hainan and rationale for optimal indicator values.

SDGs	Targets	Localized Targets	Localized Indicators	Sources	Justification for Optimum	Effect Direction
1. End poverty in all its forms everywhere	1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day	1.1 Per capita disposable income	Urban per capita disposable income	Statistics data[1]	Average of 3 best performers in Hainan	+
		disposable income	Rural per capita disposable income		Average of 3 best performers in Hainan	+
	1.a Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement	1.a Expenditure on health, social security and education by city and county	Health and hygiene Expenditure	Statistics data[1]	Average of 3 best performers in Hainan	+
			Social Safety net expenditure		Average of 3 best performers in Hainan	+
			Education expenditure	Statistics data[1]	Average of 3 best performers in Hainan	+

programmes and policies to end						
poverty in all its dimensions						
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture	2.1 End hunger, achieve food security and improved nutrition and promote sustainable agriculture	2.1 Food security guarantee	Total grain production Food production per capita	$x_1 = \frac{\text{Total grain production}}{\text{Total population}}[1]$	Average of 3 best performers in Hainan	+
					Average of 3 best performers in Hainan	+
	2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition	2.3 Rural per capita disposable income	Per capita disposable income of rural residents	Statistics data[1]	Average of 3 best performers in Hainan	+

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and non-farm employment

2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality	2.4 Proportion of agricultural areas engaged in productive and sustainable agriculture	Arable land per capita	$x_2 = \frac{\text{Total arable land}}{\text{Total population}}[1]$	Average of 3 best performers in Hainan	+
		Fertilizer use for food crops	Statistics data[1]	Average of 3 best performers in Hainan	-
		Amount of pesticides used	Statistics data[1]	Average of 3 best performers in Hainan	+
		Grain sown area	Statistics data[1]	Average of 3 best performers in Hainan	+
		Squash planting area	Statistics data[1]	Average of 3 best performers in Hainan	+
		Water field area	Statistics data[1]	Average of 3 best performers in Hainan	-
		Effective irrigated area of farmland	Statistics data[1]	Average of 3 best performers in Hainan	+

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				Based on the reconstructed time series of Normalized Difference Vegetation Index (NDVI) from multiple satellite images including Landsat-8, Sentinel-2 and MODIS,		
			Cultivated land replanting index	30-m planetary-scale pixel by pixel cropping intensity products were generated by enumerating the total number of valid cropping cycles using a binary crop phenophase profile indicating growing and non-growing periods.	Average of 3 best performers in Hainan	+
3. Ensure healthy lives and promote well-being for all at all ages	3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents	3.6 Deaths due to road traffic injuries as a percentage of population	<div> Traffic deaths </div> <div> Total population </div>	$x_3 = \frac{Traffic\ deaths}{Total\ population} [1]$	<div> Average of 3 best performers in Hainan </div> <div> Average of 3 best performers in Hainan </div>	<div>-</div> <div>+</div>
	3.8 Achieve universal health	3.8 Participation	Number of	Statistics data[1]	Average of 3 best	+

coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all	rate of urban workers' basic medical insurance	participants in basic medical care insurance	performers in Hainan	
3.b Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of	3.b Health and hygiene expenditure as a percentage of general public budget expenditure of the local government	General public budget expenditure of the local government	Average of 3 best performers in Hainan	+
		$x_4 = \frac{\text{Health and hygiene expenditure}}{\text{General public budget expenditure of the local government}} [1]$	Average of 3 best performers in Hainan	+

developing countries to use to the  
 full the provisions in the  
 Agreement on Trade-Related  
 Aspects of Intellectual Property  
 Rights regarding flexibilities to  
 protect public health, and, in  
 particular, provide access to  
 medicines for all

3.c Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States	3.c Number of licensed (assistant)doctors per 1,000 population	Number of licensed doctors per 1,000 population	Statistics data[1]	Average of 3 best performers in Hainan	+
		Number of licensedassistant doctors per 1,000 population		Average of 3 best performers in Hainan	+

4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	4.1 By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes	4.1 Number of primary and secondary school students in school per 10,000 people	Number of elementary school students in school per 10,000 people	Statistics data[1]	Sustainable Development Report	+
			Number of secondary school students in school per 10,000 people		Average of 3 best performers in Hainan	+
	4.b By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and	4.b Scholarship ODA amounts by sector and type of study	Education expenditure as a percentage of GDP		Sustainable Development Report	+
			Education expenditure per capita		Average of 3 best performers in Hainan	-

	information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries					
		6.1 Proportion of	Coverage rate of			
	6.1 By 2030, achieve universal and	the population	urban population		Average of 3 best	
6. Ensure	equitable access to safe and	using a safely	with access to tap	Statistics data[1]	performers in Hainan	+
availability and	affordable drinking water for all	managed drinking	water			
sustainable		water service				
management of	6.2 By 2030, achieve access to					
water and	adequate and equitable sanitation					
sanitation for	and hygiene for all and end open	6.2 Number of	Number of public		Average of 3 best	
all	defecation, paying special	public toilets per	toilets	Statistics data[1]	performers in Hainan	+
	attention to the needs of women	10,000 people				
	and girls and those in vulnerable					
	situations					



		7.1 Proportion of				
	7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	population relying primarily on clean fuels and technologies	Coverage rate of urban population with access to gas	Statistics data[1]	Average of 3 best performers in Hainan	-
7. Ensure	7.3 By 2030, double the global rate of improvement in energy efficiency	7.3 Energy consumption per unit of GDP by region	Energy consumption per unit of GDP by region	Statistics data[1]	Average of 3 best performers in Hainan	+
access to						
affordable,						
reliable,						
sustainable and	7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure	7.a Environment protection expenditure	Environment protection expenditure	Statistics data[1]	Average of 3 best performers in Hainan	+
modern energy						
for all						

and clean energy technology						
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	8.1 Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries	8.1 Per capita GDP	Per capita GDP	Statistics data[1]	Average of 3 best performers in Hainan	+
	8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal	8.5 Unemployment rate by region	Contributors of staff and worker at year-end Number of workforce	$x_7 = \frac{\text{Contributors of staff and worker at year-end}}{\text{Number of workforce personnel}}^{[1]}$	Average of 3 best performers in Hainan	+
					Average of 3 best performers in Hainan	-

	pay for work of equal value		personnel			
	8.9 By 2030, devise and					
	implement policies to promote	8.9 The reception	Reception of	Statistics data[1]	Average of 3 best	-
	sustainable tourism that creates	of overnight	overnight visitors		performers in Hainan	
	jobs and promotes local culture	tourists by region				
	and products					
	9.2 Promote inclusive and		Manufacturing		Average of 3 best	+
9. Build	sustainable industrialization and,		employment		performers in Hainan	
resilient	by 2030, significantly raise	9.2 Manufacturing				
infrastructure,	industry's share of employment	employment as a		$x_8 = \frac{\text{Manufacturing employment}}{\text{Total employment}}[1]$	Average of 3 best	+
promote	and gross domestic product, in line	share of total	Total employment		performers in Hainan	
inclusive and	with national circumstances, and	employment				
sustainable	double its share in least developed					
industrialization	countries					
and foster	9.5 Facilitate sustainable and	9.5.1 Proportion of	Proportion of		Average of 3 best	
innovation	resilient infrastructure	output value of	output value of	Statistics data[1]	performers in Hainan	+
	development in developing	secondary and	secondary and			

	countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States	tertiary industries	tertiary industries			
		9.5 Science and technology expenditure as a percentage of general public budget expenditure of the local government	Science and technology expenditure	Statistics data[1]	Sustainable Development Report	-
10. Reduce inequality within and among countries	10.2 By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status	10.2 Ratio of urban and rural per capita disposable income	Ratio of urban and rural per capita disposable income	Statistics data[1]	Average of 3 best performers in Hainan	-
11. Make cities	11.1 By 2030, ensure access for all	11.1 Percentage of	Rural population	Statistics data[1]	Average of 3 best	+

and human settlements inclusive, safe, resilient and sustainable	to adequate, safe and affordable housing and basic services and upgrade slums	rural population			performers in Hainan	
		11.1 Affairs of housing security expenditure as a percentage of general public budget expenditure of the local government	Affairs of housing security expenditure	Statistics data[1]	Average of 3 best performers in Hainan	+
	11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with	11.2 Proportion of population with easy access to public transport, disaggregated by age, sex and disability	Per capita area of paved roads	Statistics data[1]	Average of 3 best performers in Hainan	+

disabilities and older persons					
11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	11.6 Urban fine particulate matter concentration	PM2.5	Remote sensing data used to calculate the local average PM2.5 concentration/statistics data[1]	Justification for Optimum	Effect Direction
		PM10		Average of 3 best performers in Hainan	+
		Proportion of days of air quality equal to or above grade ii in the annal effective monitoring days	Statistics data[1]	Average of 3 best performers in Hainan	+
11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and	11.7 Proportion of public space area	Green covered area as % of completed area	Statistics data[1]	Average of 3 best performers in Hainan	+
		Per capita areas of parks and green	Statistics data[1]	Average of 3 best performers in Hainan	+

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persons with disabilities

land

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1. The People's Government of Hainan Province Statistical Yearbook. <https://www.hainan.gov.cn/hainan/zfsj/xsj.Shtml>