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Pathway Assumptions

		A) CURRENT TRENDS	B) NATIONAL COMMITMENTS	C) GLOBAL SUSTAINABILITY	JUSTIFICATION
1. Macroeconomics	**1.1)** GDP per capita	**SSP2**, assuming a medium rate of convergence of economic growth (approximately 2.5% increase in GDP per capita), projects GDP per capita to 2282 USD/capita/year in 2050 [1018 USD/capita/year in 2020].	**SSP1,** 3516 USD2000/cap /year in 2050. The Agriculture Development Strategy (ADS) forecasts 2242 USD/cap/year in 2030 (ADB-NEP, 2013).	**SSP1,** 3516 USD2000/cap /year in 2050. This sustainability scenario anticipates a rapid convergence of economic growth.	
	1.2) Population	**UN high growth**, projected rapid increase of 41.3 million in 2050 [29.3 million in 2020]	**UN constant fertility,** 33.3 million in 2030 and 38.7 million in 2050. This is the closest to the ADS forecast of 35.1 million in 2030.	**UN constant fertility,** 33.3 million in 2030 and 38.7 million in 2050.	
	1.3) Inflation	Prices are assumed to change due to inflation based on the **average annual Consumer Price Index (CPI)** fluctuation from 2000 to 2020.	Prices are assumed to change due to inflation based on the **average annual Consumer Price Index (CPI)** fluctuation from 2000 to 2020.	Prices are assumed to change due to inflation based on the **average annual Consumer Price Index (CPI)** fluctuation from 2000 to 2020.	
	1.4) Inequalities	-	-	-	

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2. Land	**2.1)** Constraints on agricultural expansion / deforestation	**Free expansion** of productive land under the total land boundary.	**Free expansion** of productive land under the total land boundary	**Free expansion** of productive land under the total land boundary	
	2.2) Afforestation, and forest plantations targets	**No afforestation** scenario, with forestland remaining constant to 2020 levels (5973 k ha in 2050).	**Low afforestation,** with a new forest area of 20 k ha (5993 k ha in 2030 and 2050). The ADS anticipates a 30 k ha increase in forest area by 2030 compared to 2014. ADS is expected to cover 40% of terrestrial land by 2030 (ADB-NEP 2013).	**Moderate growth,** with 50 k ha more additional forestland than in 2014.	
	2.3) Urban and settlements area	**UN high growth** in the urban population, with forecasts of 8.5 million in 2030 & 14.7 million in 2050 [6.2 million in 2020].	**UN constant fertility,** with an urban population of 8.4 million in 2030 and 13.8 million in 2050. The ADS assumed a 4% growth rate to the 2010 level.	**UN constant fertility,** with an urban population of 8.4 million in 2030 and 13.8 million in 2050.	
	2.4) Protected areas (PA)	**No Expansion**, of the current 23% PA of the country's total area by 2030 [3327.8 k ha in 2020, 2030 and 2050].	**PA Expansion to 25%** of total area by 2030 [3707 k ha in 2030 and in 2050]. The national government has no specific goals, but it is committed to expanding PAs (ADB-NEP, 2013).	**PA Expansion to 30%** of total land area by 2030 [4441 k ha in 2030 and in 2050]. A new Aichi target of 30% of terrestrial land by 2030 is being discussed. We expected a moderate growth to achieve this aim by 2050.	

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3. Productivity and management	**3.1)** Crop productivity for the key crops	**BAU** scenario, with the productivity of major crops as: - *Paddy*: 4.1 t/ha in 2050 [3.8 t/ha in 2020], - *Maize*: 3.2 t/ha in 2050 [2.9 t/ha in 2020], - *Wheat*: 3.5 t/ha in 2050 [3.1 t/ha in 2020]. - *Millet:* 1.2 t/ha in 2050 [1.2 t/ha 2020]. - *Barley:* 3.9 t/ha in 2050 [1.3 t/ha in 2020].	**Low growth** scenario, as ADS forecasts a 2% annual growth rate in cereal production until 2030, which corresponds to the following for the major crops: - *Paddy*: 4.2 t/ha in 2050, - *Maize*: 3.5 t/ha in 2050, - *Wheat*: 3.4 t/ha in 2050, - Millet: 1.2 t/ha in 2050, - Barley: 2.0 t/ha in 2050.	**High growth** scenario, with substantial yield potentials as follows: - *Paddy*: 5.2 t/ha in 2050, - *Maize*: 3.9 t/ha in 2050, - *Wheat*: 5.0 t/ha in 2050, - Millet: 1.2 t/ha in 2050, - Barley: 5.3 t/ha in 2050.	
	3.2) Cropland under agroecological practices	**No change** from 2010 in the adoption of agro-ecological practices, such as diversified farming (61.5%), conservation tillage (95%), embedded natural farming (25%) and organic farming (0.23%).	**No change** from 2010, in the adoption of agro-ecological practices.	**No change** from 2010 level, in the adoption of agro-ecological practices.	
	3.3) Livestock productivity for the key livestock products	**BAU** Growth scenario with: - *Milk* 2.5 t/LU in 2050 [2.1 t/LU in 2020], - *Pork* 0.11 t/LU in 2050 [0.09 t/LU in 2020], - *Beef* 0.03 t/LU in 2050 [0.04 t/head in 2020], - *Chicken meat* 0.37 t/LU in 2050 [0.33 t/LU in 2010], - *Mutton* 0.05 t/LU in 2050	**High Growth** scenario with: - *Milk* 2.7 t/LU in 2050, - *Pork* 0.12 t/LU in 2050, - *Beef* 0.05 t/LU in 2050, - *Chicken meat* 0.41 t/LU in 2050, - *Mutton* 0.06 t/LU in 2050, - *Eggs* 1.04 t/LU in 2050. According to ADB-NEP (2013), milk yield was 900 litres/lactation in 2010, and	**High Growth** scenario with: - *Milk* 2.7 t/LU in 2050, - *Pork* 0.12 t/LU in 2050, - *Beef* 0.05 t/LU in 2050, - *Chicken meat* 0.41 t/LU in 2050, - *Mutton* 0.06 t/LU in 2050, - *Eggs* 1.04 t/LU in 2050.	

		[0.05 t/LU in 2020], - *Eggs* 0.08 t/head in 2050 [0.08 t/head in 2020].	under the ADS plan, it is expected to increase to 2000 litres/lactation in 2030.		
	3.4) Pasture stocking rate	**BAU** growth scenario with 6.3 LU/ha cattle stocking density in 2050 [4.3 LU/ha in 2020].	**BAU** growth scenario with 6.3 LU/ha cattle stocking density in 2050.	**High growth** scenario with 7.0 LU/ha cattle stocking density in 2050.	
	3.5) Forest management	-	-	-	
4. Trade	**4.1)** Share of consumption which is imported for key imported products (%)	**Stable** imports at 2020 levels until 2050, with import shares in consumption such as: - *Paddy:* 23%, - *Maize:* 20%, - *Wheat:* 16%, - *Millet:* 6%, and - *Barley:* 35%.	**Reduce** import shares in food consumption by half by 2050, if the levels in 2020 are more than 5%; otherwise, reduce them to zero, as: - Paddy: 12.5%, - Maize: 10%, - Wheat: 8%, - Millet: 3%, and - Barley: 17.5%. The ADS plans to limit import to 4% per year (598 million dollars in 2010 and 1310 million dollars in 2030) and maintain 0-5% trade surplus in food grains (ADB-NEP, 2013).	**Reduce** import shares in food consumption by half by 2050 from its level in 2020 as: - *Paddy:* 12%, - *Maize:* 10%, - *Wheat:* 8%, - *Millet:* 3%, and - *Barley:* 17.5%.	
	4.2) Evolution of exports for key exported products	**Stable** exports up to the maximum historical exports from 2000 to 2020, as follows:	**Increase** exports by 1.3 times of the largest historical exports between	**Increase** exports by 1.5 times the maximum	

		- *Wheat* 9.0 k ton in 2050, - *Pulses* 37.0 k ton in 2050, - *Lentil* 37.5 k ton in 2050, - *Tea* 14.0 k ton in 2050, - *Spices* 36.9 k ton in 2050.	2000 and 2020 by 2050, as follows: - *Wheat* 11.7 k ton in 2050, - *Pulses* 49.2 k ton in 2050, - *Lentil* 48.8 k ton in 2050, - *Tea* 18.2 k ton in 2050, - *Spices* 47.9 k ton in 2050. The ADS has set an annual growth rate of 11% for agricultural export value. Lentil, cardamom, wheat and tea have identified as prospective export commodities (ADB-NEP, 2013).	historical exports from 2000 to 2020 by 2050, as: - *Wheat* 13.5 k ton in 2050, - *Pulses* 56.8 k ton in 2050, - *Lentil* 56.4 k ton in 2050, - *Tea* 21.0 k ton in 2050, - *Spices* 55.3k ton in 2050.	
5. Food	**5.1)** Average dietary composition	**Current FAOSTAT diet** for 2020(in kg/cap/yr): - Cereals: 242.7, - Roots: 91.4, - Sugar: 55.3, - Pulses: 14.5, - Nuts: 1.2, - Veg. oils: 10.4. - Fruits (Tropical): 17.8, - Fruits (Temperate): 33.5, - Vegetables 138.5, - Beverages: 0.4, - Spices: 5.4;	**ICMR-WHO recommended diet**[1], increase dietary diversity, ensuring a minimum daily per capita consumption of 2144 kcal; more protein and micronutrients; increase animal protein from 13% to 30% by 2030 (in kg/cap/year): - Cereals: 192.6, - Roots: 31.9, - Sugar: 15.5,	**EAT-Lancet recommended diet,** as(in kg/cap/year): - Cereals: 77.5, - Roots: 16.7, - Sugar: 10.5, - Pulses: 25.1, - Nuts: 16.7, - Veg. oils: 13.4, - Fruits & vegetables: 167.0, - Beef, mutton, pork: 4.7, - Poultry: 9.7, - Fish: 9.4, - Eggs: 4.3,	

[1] ICMR-WHO recommended diet is calculated for Nepal based on the Indian Council of Medical Research (ICMR) and World Health Organization (WHO) recommendations. See Pokhrel (2020) for the details.

		- Alcohol: 5.4, - Beef and mutton: 10.9, - Pork 1.0, - Poultry: 2.3, - Fish: 31.6, - Eggs: 2.5, - Milk: 37.4, - Dairy products: 2.1, - Animal fat: 0.3, - Others: 2.7.	- Pulses: 14.8, - Nuts: 9.9, - Veg. oils: 12.0, - Fruits & vegetables: 84.0, - Beef, mutton, pork: 2.2, - Poultry: 4.5, - Fish: 4.3, - Eggs: 11.0, - Milk: 54.8, - Animal fat: 3.5. Source: Pokhrel (2020).	- Milk: 83.5, - Animal fat: 3.9.	
	5.2) Share of food consumption which is wasted at household level	**Constant** share of food consumption as in 2010: - Cereals 5%, - Roots: 14%, - Pulses: 3%, - Nuts: 3%, - Veg. oils: 3%. - Fruits & Vegetables 16%, - Beef and mutton: 11%, - Poultry: 11%, - Fish: 17%, - Milk: 11%.	**Reduced** share in comparison to 2010, as: - Cereals 4%, - Roots: 12%, - Pulses: 3%, - Nuts: 3%, - Veg. oils: 3%. - Fruits & Vegetables 15%, - Beef and mutton: 10%, - Poultry: 10%, - Fish: 15%, - Milk: 10%.	**Reduced** share in comparison to 2010, as: - Cereals 4%, - Roots: 12%, - Pulses: 3%, - Nuts: 3%, - Veg. oils: 3%. - Fruits & Vegetables 15%, - Beef and mutton: 10%, - Poultry: 10%, - Fish: 15%, - Milk: 10%.	
6. Biofuels	**6.1)** Targets on biofuel and/or other bioenergy use	**No use** of biofuels for the period 2010-2050.	**No use** of biofuels for the period 2010-2050.	**No use** of biofuels for the period 2010-2050.	
	6.2) Targets on other non-food use	-	-	-	

7. Water	**7.1)** Irrigated crop area	No assumption is made for an increase in irrigation areas.	The ADS plans to increase irrigated land to 1071 k ha by 2033 (ADB-NEP, 2013).	No assumption is made.	

References:

1) ADB-NEP (2013) Final Report. Technical Assistance for the Preparation of the Agricultural Development Strategy, Asian Development Bank (ADB)-Nepal (NEP), June, Project Number: TA 7762 – NEP.
2) Pokhrel, S. 2020. Food availability and consumption in relation to developing strategies for sustained produciton and supply in Nepal. https://afu.edu.np/sites/default/files/Food%20availability%20and%20consumption%20in%20relation%20to%20developing%20strategies%20for%20sustained%20production%20and%20supply%20in%20Nepal.pdf