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Pathway Narratives				
	A) CURRENT TRENDS	B) NATIONAL COMMITMENTS	C) GLOBAL SUSTAINABILITY	Justification
General description	We do not act differently than in the past decade/today	National actions/policies are aligned with national commitments	National actions/policies are aligned with global sustainability targets	
Country Narrative - main elements that have guided the selection of the assumptions under each pathway	Our current trends are motivated by the existing policy landscape. We project high population growth and increasing demand for food, moderate economic growth and lower inequality, increased use of fertilizers particularly nitrogen to increase productivity, and moderate mitigation activity to cope with climate change with low enforcement of environmental protection policies. We also assume low targets of renewable and first-generation biofuels. We assume the carbon concentration trajectory to transition towards a 2-degree increase in global temperature (RCP 6.0)	Our national commitments are aligned with national policies that aim to reduce undernutrition and obesity amongst the population along with reduced food loss and waste. We assume high population growth and high demand for food. However, increased economic growth in line with the SSP1 trajectory is assumed. This growth promotes national targets of increased exports and reduced dependence on imports. We assume India's commitment to the Bonn Challenge and expansion of protected areas in the future. We assume the implementation of the National Biofuel Policy by implementing a blending target of 20% by 2030. We assume the carbon concentration trajectory to transition towards the 1.5-degree increase in global temperature (RCP 4.5)	Assumptions in this scenario are aligned with global targets. We assume lower population growth rates and high economic growth in line with the SSP1 trajectory. We assume the doubling of exports and reduced dependence on imports for India. We assume India's commitment to the Revised Bonn Challenge, no deforestation beyond 2030, and expansion of protected area by 30*30 by 2030. We assume the implementation of the National Biofuel Policy by linearly increasing the use of biofuels by 2030. We assume the carbon concentration trajectory to transition towards a 1-degree increase in global temperature (RCP 2.6)	UN Population NDC Agricultural Outlook and Situation Analysis Reports My Plate for the Day Evaluation of Centrally Sponsored Schemes in Water Resources, Environment and Forest Sector

Pathway Assumptions					
		A) CURRENT TRENDS	B) NATIONAL COMMITMENTS	C) GLOBAL SUSTAINABILITY	Justification
1. Macroeconomics	1.1) GDP per capita	Increase in GDP per capita by 5.9 times in 2050 compared to 2000	Increase in GDP per capita by 7.2 times in 2050 compared to 2000	Increase in GDP per capita by 6.5 times in 2050 compared to 2000	Our assumptions in this case follow the SSPs framework where we assume SSP2 for Current Trends and National, Commitments and SSP1 for the Global Sustainability target (O'Neill et.al., 2014) Supporting for current trends: Summary of the economic survey 2022-23
	1.2) Population	The population is expected to reach 1.71 billion by 2050 based on our underlying assumption of UN - Constant fertility parameterization	The population is expected to reach 1.52 billion by 2050 based on our underlying assumption of UN - Low growth parameterization	The population is expected to reach 1.67 billion by 2050 based on our underlying assumption of UN - Medium growth parameterization	UN Population
	1.3) Inflation	7% until 2023	Projected to be at 4% by 2024	Using prices expressed at current rates	Reserve Bank of India. Monetary Policy Report – April 2021. Reserve Bank of India. Monetary Policy Report – September 2022.
	1.4) Inequalities	Gini Coefficient (a measure of real inequality) has reduced to a level near the lowest recorded – it was 0.292 in 2020-21, while the lowest was	Needs to be further investigated	Needs to be further investigated	State of Inequality in India Report 2022 IMF Working Paper

		recorded in 1993-94 at 0.284. (This is tentative)			
2. Land	2.1) Constraints on agricultural expansion/ deforestation	Free expansion of agricultural land beyond protected areas	Deforestation will be halted beyond 2030	Deforestation will be halted beyond 2030	India's Nationally Determined Contribution (NDC)
	2.2) Afforestation, and forest plantations targets	India made a Bonn Challenge pledge to turn 13 million hectares of degraded land into restoration by 2020 and an additional 8 million hectares by 2030 (a total of 21 million ha) at the UN Framework Convention on Climate Change (UNFCCC) Conference of Parties (CoP) 2015 in Paris.	Revised Bonn Challenge (26 mHA additional afforestation by the year 2030)	Revised Bonn Challenge (26 mHA additional afforestation by the year 2030)	This assumption is based on India's additional commitment of 5 Mha in line with the existing Bonn Challenge commitment (2014). This new commitment was announced by the Government of India at the UN Summit in 2019 (Prime Minister's Office, 2019). India has brought an area of 9.8 million hectares under restoration since 2011, meaning that the restoration work of these landscapes is already underway
	2.3) Urban and settlements area	Urban area will increase by 1.8 times in 2050 compared to 2020 (needs to be further looked into)	Urban area will increase by 1.53 times in 2050 compared to 2020 (needs to be further looked into)	Urban area will increase by 1.21 times in 2050 compared to 2020 (needs to be further looked into)	UN-Habitat Report 2022
	2.4) Protected areas	Protected areas remain stable until 2050: by 2050 they represent 6% of total land.	Expansion to 30*30 by 2030	Expansion to 30*30 by 2030	Indian protected areas were computed using the data from the World Database on Protected Areas (UNEP-WCMC & IUCN, 2020). The assumptions are in line with India's commitment to the

					<p>CBD. India has exceeded the terrestrial component of 17 percent of the Aichi target 11 which aimed towards conserving at least 17% of terrestrial and inland water, and 10% of coastal and marine areas.</p>
3. Productivity and management	3.1) Crop productivity for the key crops	Same productivity as of 2020	We assume high productivity growth. Compared to 2020, crop productivity in 2050 increases from 2.98 t/ha to 7.07 t/ha for corn, 3.5 t/ha to 4.02 t/ha for wheat, 0.92 t/ha to 3.41 t/ha for soybeans, etc.	We assume high productivity growth. Compared to 2020, crop productivity in 2050 increases from 2.98 t/hc to 7.07 t/ha for corn, 3.5 t/ha to 4.02 t/ha for wheat, 0.92 t/ha to 3.41 t/ha for soybean, etc.	<p>Our assumptions are based on the National Council of Applied Economic Research (2015) which suggests that due to technological innovation and diffusion through institutional arrangements, growth in yields will be high in the coming decades.</p> <p>NCAER 2015 Report</p> <p>NCAER 2017 report</p>
	3.2) Cropland under agroecological practices	No specific/accurate data. Needs to be looked into further	Plan to expand the area under agroecological practices (including organic and natural farming) to 2 mHa by 2024. No other specific/accurate data. Needs to be looked into further. Targets need to be identified accordingly	No specific/accurate data. Needs to be looked into further. Targets need to be identified accordingly	<p>Patel N., Dorin B., Nagaich R., 2022. A New Paradigm for Indian Agriculture. From Agroindustry to Agroecology, NITI Aayog, New Delhi, 70 p.</p> <p>Post Harvest Management Support to Encourage Organic Farmers</p> <p>Agroecology and Natural Farming Could Accelerate</p>

				Inclusive Economic Growth in India Organic Farming in the Country Natural Farming NITI initiative Productivity of Dairy Animals	
	3.3) Livestock productivity for the key livestock products	We assume that by 2050, livestock productivity will increase moderately based on improvements in feed basket content and livestock production systems.	By 2050, livestock productivity will increase at a higher rate compared to 2020 based on the improvement in feed baskets and livestock production systems.	By 2050, livestock productivity will increase at a higher rate compared to 2020 based on the improvement in feed baskets and livestock production systems.	Productivity of Dairy Animals
	3.4) Pasture stocking rate	By 2050, the average ruminant livestock stocking density is 2.13 TLU/ha. Based on the assumption that The stocking density remains unchanged from the value in 2020 according to FAOSTAT (herd numbers divided by pasture area).	Same as Current Trends	Same as Current Trends	Several initiatives were taken to improve livestock feeding systems because, by 2025, India is likely to experience a fodder deficit of about 65% for green fodder and 25% for dry fodder (Indian Council of Agricultural Research, 2015; Ministry of Agriculture and Farmer's Welfare, 2017; Planning Commission, 2012).
	3.5) Forest management	Minimum one-thirds of total land to be under tree and forest cover	Minimum one-third of total land to be under tree and forest cover	Minimum one-third of total land to be under tree and forest cover	India's Draft National Forest Policy 2018
4. Trade	4.1) Share of consumption which is imported for key imported products (%)	By 2050, the volume of imports remains at: <ul style="list-style-type: none"> 9.57 Mt of Palm oil 1.927 Mt of other pulses 6.087 Mt of soy oil 	By 2050, the volume of imports remains at: <ul style="list-style-type: none"> 8.61 Mt of Palm oil 1.428 Mt of other pulses 6.15 Mt of soy oil 	By 2050, the volume of imports remains at: <ul style="list-style-type: none"> 9.397 Mt of Palm oil 2.413 Mt of other pulses 7.38 Mt of soy oil 	Reduced share compared to 2020 for select products - oils (30% reduction)

		<ul style="list-style-type: none"> • 1.150 Mt of Nuts 	<ul style="list-style-type: none"> • 16.76 Mt of Nuts 	<ul style="list-style-type: none"> • 30.316 Mt of Nuts 	
	4.2) Evolution of exports for key exported products (1000 tons)	<p>By 2050, the volume of exports will reach to:</p> <ul style="list-style-type: none"> • 3.3 Mt for corn. • 32.4 Mt for Rice • 1.4 Mt for wheat. • 1.01 Mt for groundnut • 0.933 Mt for beef. 	<p>By 2050, the volume of exports will reach to:</p> <ul style="list-style-type: none"> • 5 Mt for corn. • 39.6 Mt for Rice • 1.34 Mt for wheat. • 0.91 Mt for groundnut • 0.81 Mt for beef 	<p>By 2050, the volume of exports will reach to:</p> <ul style="list-style-type: none"> • 5.73 Mt for corn. • 35.02 Mt for Rice • 1.2 Mt for wheat. • 0.81 Mt for groundnut • 0.32 Mt for beef 	Agriculture Export Policy Exports doubled in comparison to 2020, with targets of diverse products which need to be looked at.
5. Food	5.1) Average dietary composition	<p>By 2050, the average daily calorie consumption per capita is 2672 kcal, out of which 61% is obtained from cereals, 5% from fruits and vegetables, 3.6% from milk, 7 % each from sugar, pulses, and oilseeds, and 4% from animal meat.</p>	<p>By 2050, the average daily calorie consumption per capita is 2383 kcal out of which 38.5% is obtained from cereals, 10.5% from fruits and vegetables, 9.5% from milk, 8% from sugar, 6.4% from pulses, 11% from oilseeds and 5% from animal meat.</p>	<p>By 2050, average daily calorie consumption per capita is 2354 kcal out of which 32% is obtained from cereals, 8 % from fruits and vegetables, 6% from milk, 4.7% from sugar, 11% from pulses, 14% from oilseeds and 9% from animal meat</p>	My Plate for the Day
	5.2) Share of food consumption which is wasted at household level	5% reduction in food waste	Same as CT	Reduced share as compared to 2020 (0% food waste by 2050)	My Plate for the Day
6. Biofuels	6.1) Targets on biofuel and/or other bioenergy use	<p>India's average blending rate for ethanol in gasoline is expected to reach a record 5.8%, up from a previous record 4.1% in 2019 (work in progress)</p>	<p>Based on the implementation of India's New Biofuel Policy, 2018. The policy proposes an indicative target of 20% blending of ethanol in petrol and 5% blending of biodiesel in diesel by 2030. (work in progress, to be implemented)</p>	<p>Linear increase after 2030 (work in progress)</p>	Cabinet approves Amendments to the National Policy on Biofuels -2018 National Policy on Biofuels 2018

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	6.2) Targets on other non-food use	Needs further discussion	Needs further discussion	Needs further discussion	
7. Water	7.1) Irrigated crop area	Same as 2020 (Currently under development)	Need to double irrigated areas as compared to 2020 by improving water use efficiency (currently under development)	Need to double irrigated areas as compared to 2020 by improving water use efficiency (currently under development)	Blue water footprint per person is expected to decrease by 30.3% based on population projections (Indian Ministry of Water Resources, 2011; Milner et al., 2017). Coverage under Drip and Micro Irrigation Evaluation of Centrally Sponsored Schemes in Water Resources, Environment and Forest Sector