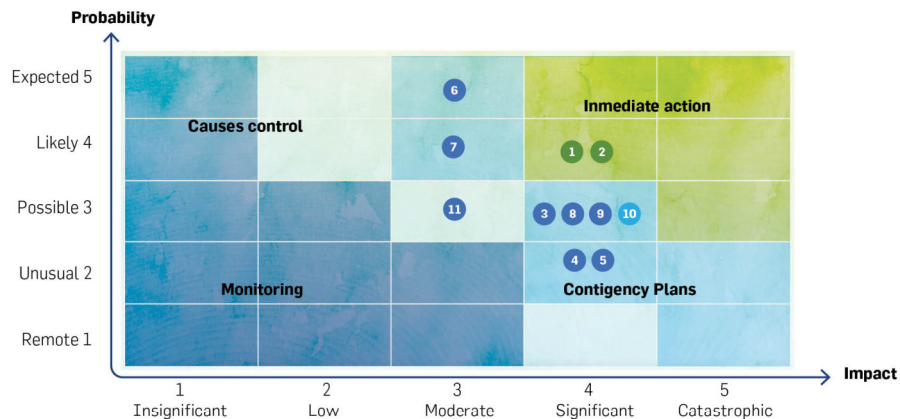




# SCENARIO ANALYSIS

## CORPORATE RISK MAP



Risk	Responsible Party
1 Instability in the regulatory framework for labeling and nutritional profiles.	Legal and Corporate Affairs VP.
2 Financial risk due to volatility in commodity prices and exchange rates.	Administrative and Financial VP.
3 Non-compliance with the regulatory framework and/or stock market regulations.	Corporate Marketing VP/ Corporate Affairs VP.
4 Failure in food safety control.	Supply Chain VP.
5 Supply chain disruption.	Supply Chain VP.
6 Highly competitive environment.	Corporate Marketing VP/ Supply Chain VP.
7 Effect of climate change.	Supply Chain VP.
8 Changes in consumer trends.	Corporate Marketing VP.
9 Impact on sales growth caused by changes in channel dynamics and structure of distribution channels.	Sales VP.
10 Information Security Risk	Administrative and Financial VP.
11 Difficulty in acquiring key talent.	Human Resources VP.

## CLIMATE CHANGE MANAGEMENT POLICY

At Colombina we are committed to the management of climate change through the reduction of greenhouse gas emissions, adaptation to climate change, based on an environment of implementation and management in line with national and international policies and standards.

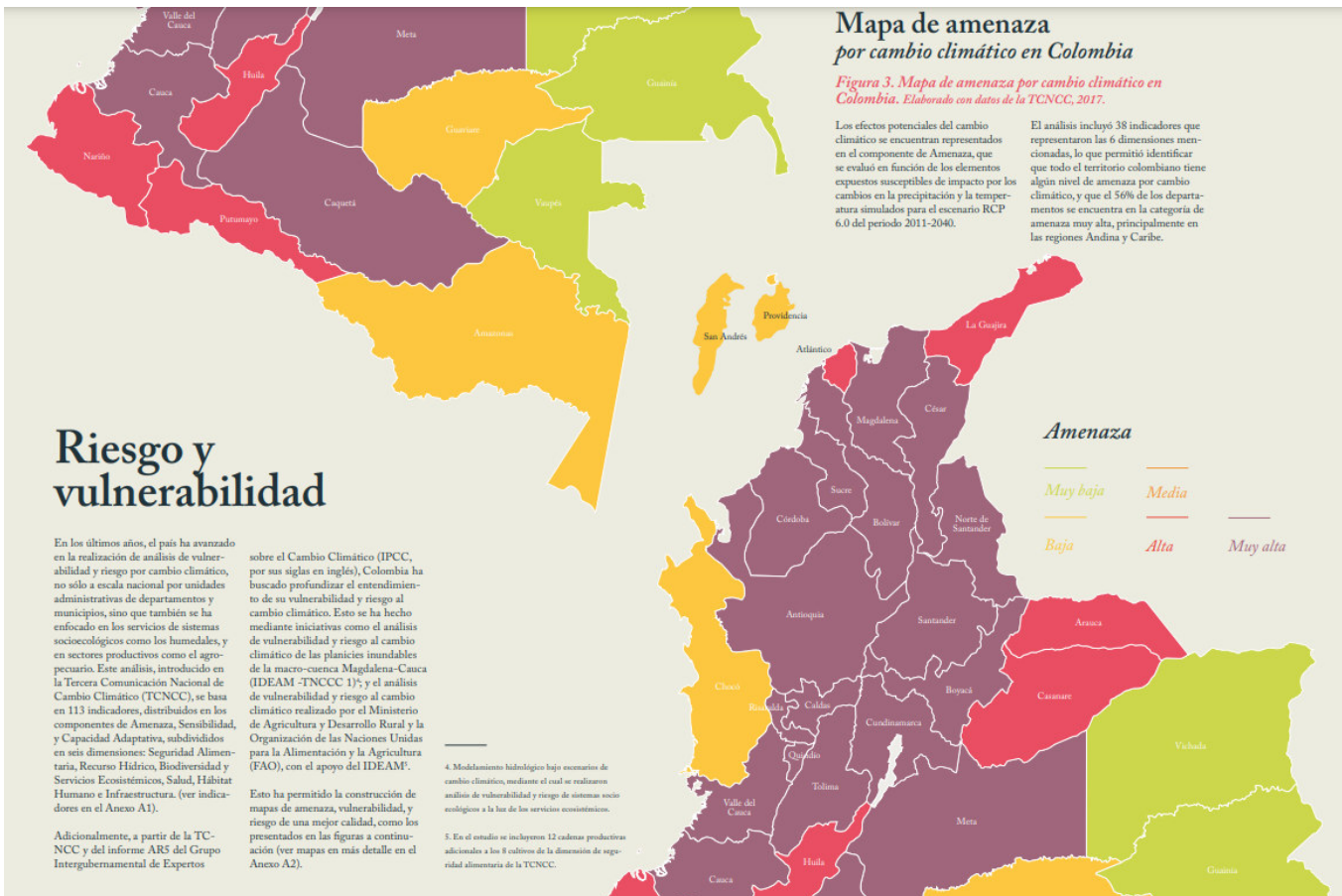
Our science-based objective for the year 2030, in line with Colombia's National Contribution, will be to reduce Scope 1 and 2 emissions by 21%



**¿How can we mitigate the climate change generated by our operations?**

# How does climate change affect our industry?

Our primary climate-related scenario analysis is based on intended Nationally Determined Contribution (iNDC) of Colombia. Scenario RCP 6.0 for the period 2011-2040



## Threat map due to climate change in Colombia Prepared with data from the TCNCC, 2017.

The potential effects of the change climate are represented in the Threat component, which was evaluated based on the elements exposed susceptible to impact by changes in precipitation and temperature simulated for CPR scenario 6.0 from the 2011-2040 period.

The analysis included 38 indicators that represented the 6 dimensions mentioned, which made it possible to identify that the entire Colombian territory has some level of threat by change climate, and that 56% of the departments is in the category of very high threat, mainly in the Andean and Caribbean regions.



## How does climate change affect our industry?

**Our primary climate-related scenario analysis is based on intended Nationally Determined Contribution (iNDC) of Colombia. Scenario RCP 6.0 for the period 2011-2040**

### **Risk and vulnerability**

In recent years, the country has advanced in conducting vulnerability analysis and climate change risk, not only on a national scale by units department administration and municipalities, but also focused on system services socio-ecological such as wetlands, and in productive sectors such as agriculture. This analysis, introduced in the Third National Communication of Climate Change (TCNCC), is based in 113 indicators, distributed in the components of Threat, Sensitivity, and Adaptive Capacity, subdivided in six dimensions: Food Security, Water Resources, Biodiversity and Ecosystem Services, Health, Habitat Human and Infrastructure.

Additionally, from the TCNCC and the AR5 report of the Group Intergovernmental Expert on Climate Change (IPCC for its acronym in English), Colombia has sought to deepen the understanding of their vulnerability and risk to climate change. This has been done through initiatives such as the analysis of vulnerability and risk to change floodplain climate of the Magdalena-Cauca macro-basin (IDEAM-TNCCC 1)4; And the analysis of vulnerability and risk to change climate carried out by the Ministry of Agriculture and Rural Development and the United Nations for Food and Agriculture (FAO), with the support of IDEAM.

This has allowed the construction of hazard maps, vulnerability, and risk of better quality, such as presented in the figures below (see maps in more detail in the Annex A2).

*4. Hydrological modeling under scenarios of climate change, by means of which vulnerability and risk analysis of partner systems in the light of ecosystem services.*

*5. The study included 12 production chains additional to the 8 crops of the safety dimension food of the TCNCC.*

# How does climate change affect our industry?

Our primary climate-related scenario analysis is based on intended Nationally Determined Contribution (iNDC) of Colombia.

## Assumptions and methodological approaches

- The National Greenhouse Gas Inventory for 2010 was prepared by IDEAM in the context of the First Biennial Update Report and the Third National Communication on Climate Change, according to the IPCC 2006 Guidelines.
- The Global Warming Potential (GWP) values used correspond to the Second Assessment Report of the IPCC (1995) for a 100-year period.
- The AFOLU sector (agriculture, forestry and other land uses)<sup>3</sup> is included in the economy-wide target. The country has significantly improved the information for the characterization and quantification of emissions and removals in this sector, and will continue undertaking efforts to obtain better activity data, emission factors and projections. These efforts may lead to fine-tuning this information, i.e. in agro-forestry and silvopastoral systems, which offer great mitigation potential in the country.

To estimate the BAU and emissions reductions scenarios, the carbon emission and removals from forest plantations and permanent crops are included; it excludes removals from natural forests that still remain as natural forests<sup>4</sup>.

- The BAU scenario includes efforts to increase energy efficiency in the industrial, residential and commercial sectors, fugitive emissions due to the deceleration of oil and coal production, and deforestation trends under post-conflict scenarios.
- The BAU scenario projections were independently made for each of the productive sectors, using the input of experts, based on macroeconomic assumptions, the analysis of current and prospective policies, and official information from IDEAM regarding the historical path of emissions.

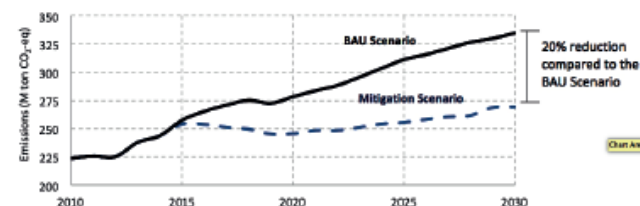
The information on deforestation was projected taking into account the 2013 -2017 Forest Reference Emissions Level for the Amazon region presented to the UNFCCC in December 2014. An aggregated analysis was then made to estimate the sectorial emissions projection at a national scale.

- The emission growth drivers at a sectorial level correlate to the following macro-economic variables:
  - i. Urban, rural or aggregated population: projections of the National Statistics Administrative Department (DANE) for 2020<sup>5</sup> and extrapolation up to 2050. The population distribution between rural and urban areas was estimated with UN methodologies<sup>6</sup>, based on the DANE projections for 2020.
  - ii. Gross Domestic Product (GDP): For the sectorial GDP projections, the Dynamic Product Input was used with adjustments in the model that allowed for modification of the contribution of the oil and coal sectors to national GDP, which affected the behavior of other sectors.

The growth expectation of each sector was reviewed with the National Planning Department (DNP) and other experts to define highly likely scenarios for Colombia up to 2050, using an average growth in per capita GDP of 3.1% per year. Furthermore, the government analyzed historical trajectories and current and prospective policies of the activity data.

## Unilateral and unconditional target

The Republic of Colombia commits to reduce its greenhouse gas emissions by 20% with respect to the projected Business-as-Usual Scenario (BAU) by 2030.



## Conditional Target

Subject to the provision of international support, Colombia could increase its ambition from 20% reduction with respect to BAU to 30% with respect to BAU by 2030.

## Type of target

Deviation with respect to a projected BAU scenario

## Timeframe

- 2030.
- Based on the outcome of the climate negotiations in Paris in the COP 21, Colombia will consider communicating an indicative target for 2025, consistent with its 2030 target.

## Scope

- Economy-wide target
- It covers 100% of national emissions, according to the 2010 National Greenhouse Gas Inventory (INGEI 2010)
- It includes the 6 gases acknowledged by the Kyoto protocol: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, SF<sub>6</sub>
- It covers all emission sectors acknowledged by the Intergovernmental Panel on Climate Change (IPCC)
- It covers the entire national territory

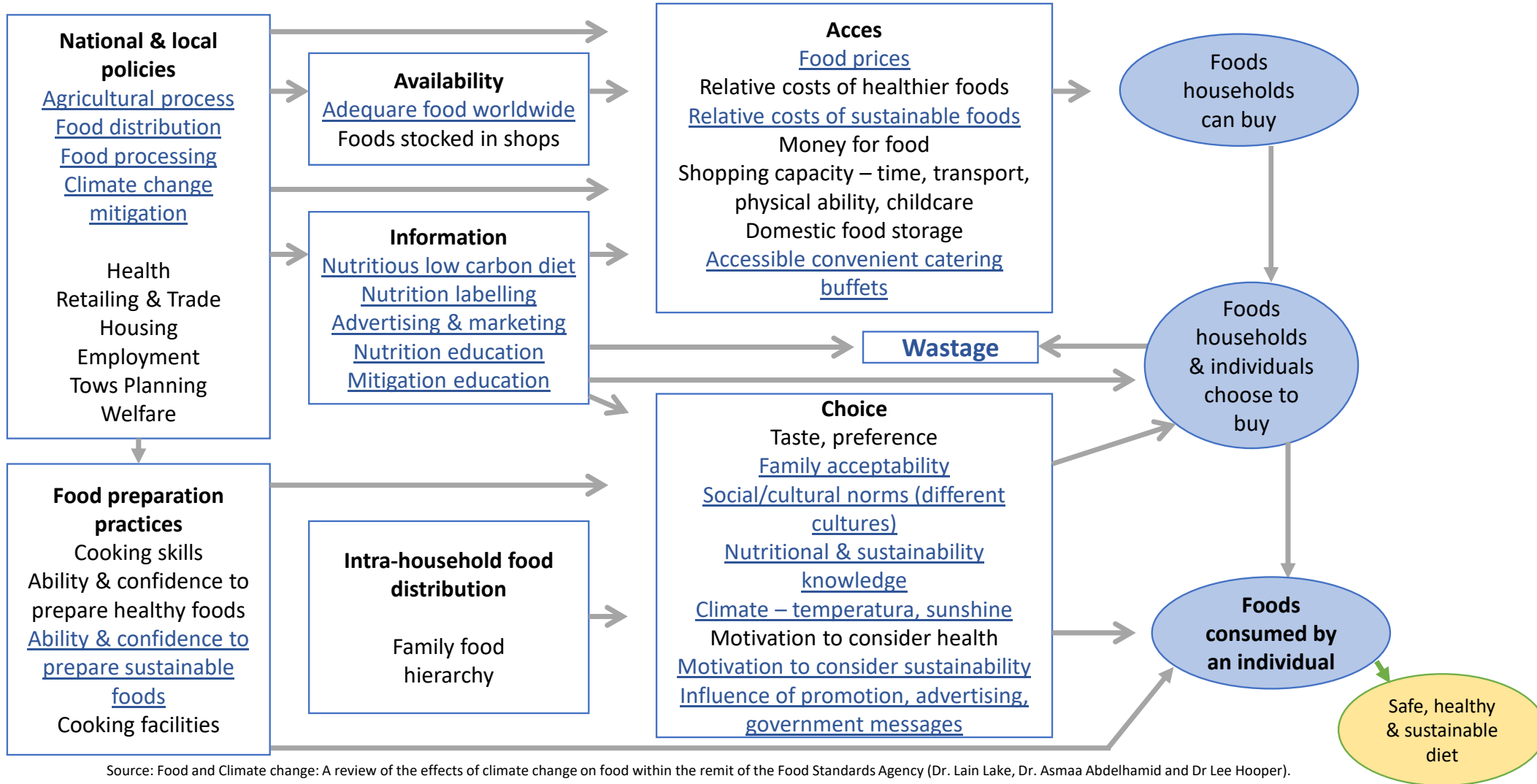
## Reference Level

The reference level is the projected BAU scenario. This scenario was developed in 2015, starting from the quantified inventory of GHG emissions in 2010 and includes the following emissions pathway:

- 2010: 224 Mton of CO<sub>2</sub>eq
- 2020: 278 Mton of CO<sub>2</sub>eq
- 2030: 335 Mton of CO<sub>2</sub>eq

## How does climate change affect our industry?

The factors highlighted in purple are those that may be affected by climate change

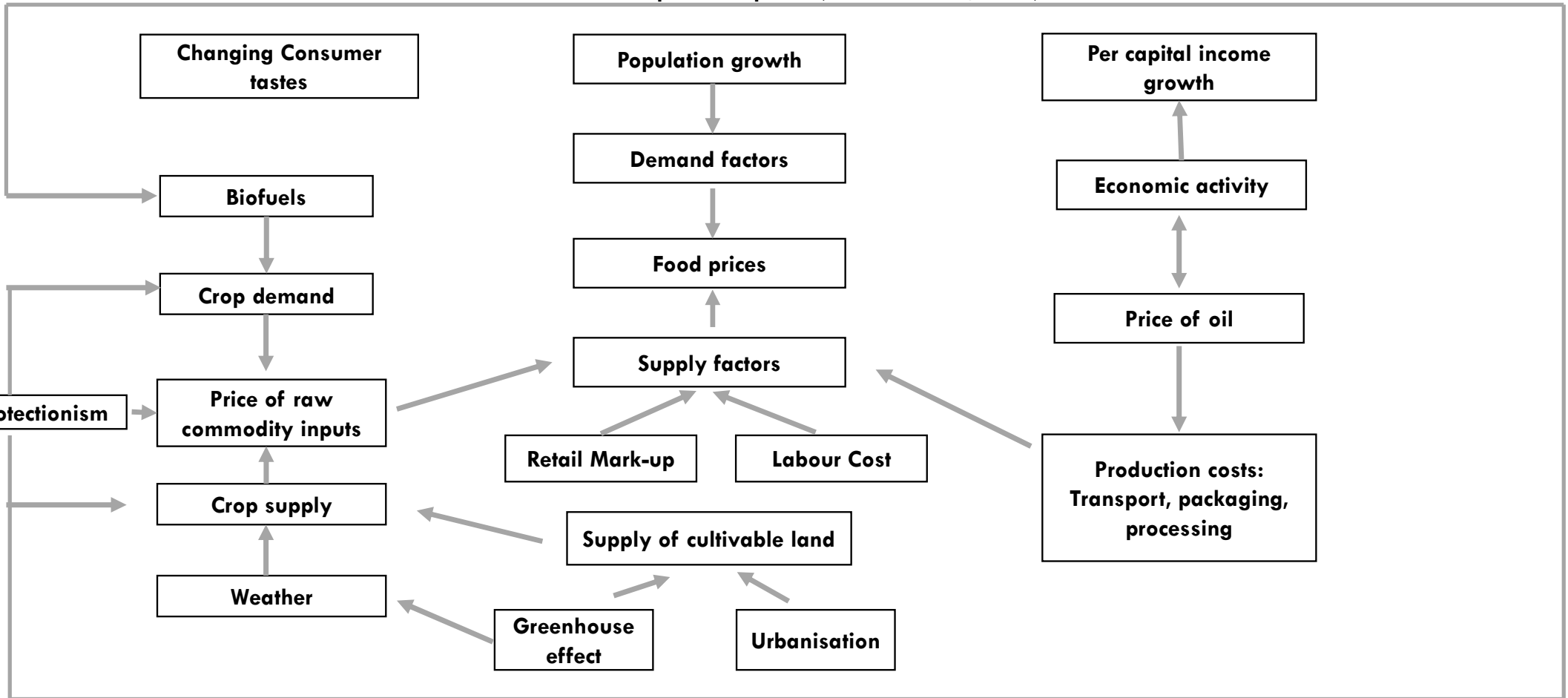


Source: Food and Climate change: A review of the effects of climate change on food within the remit of the Food Standards Agency (Dr. Lain Lake, Dr. Asmaa Abdelhamid and Dr Lee Hooper).

## How does climate change affect our industry?

New models to understand the likely effects of climate change on food prices and availability are required. What is clear is that at the moment the only variable that we can quantify its financial impact is the variation in the prices of raw material

**Influences upon food prices (Source DEFRA, 2008)**



Source: Food and Climate change: A review of the effects of climate change on food within the remit of the Food Standards Agency (Dr. Lain Lake, Dr. Asmaa Abdelhamid and Dr Lee Hooper).

## How does climate change affect our industry?

### Physical Risks

Flooding  
Drought  
Sea level rise  
Heat stress  
Wind



Extreme  
Weather

### Transition Risks

- Regulatory
- Customer demands
- Failure to invest in technological innovations
- Increased stakeholder concerns/backlash



### Potential financial impacts

- Financial risk due to volatility in commodity prices
- Increase in raw material prices
- Supply chain disruption (ie power, transportation, worker availability)
- Physical damage to assets
  - Increase in taxes
- Changes in demand for products (positive or negative)