A widespread shift to sustainable diets requires rapid risk perception

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I) Environmental impact of dietary choices

Lifestyle change is an important demand-side measure to mitigate climate change.[1,2]

Besides the land use and GHG emissions, the food system damages natural ecosystems and pushes the Earth towards the planetary boundaries for global freshwater use, deforestation, and ocean acidification.[3,4]

Therefore, diet changes can significantly mitigate the adverse environmental effects of the global food system,

and assist in reaching multiple Sustainable Development Goals[5], from Zero Hunger (#2) to Climate Action (#13), Life on Land (#15) and Responsible Consumption and Production (#12).
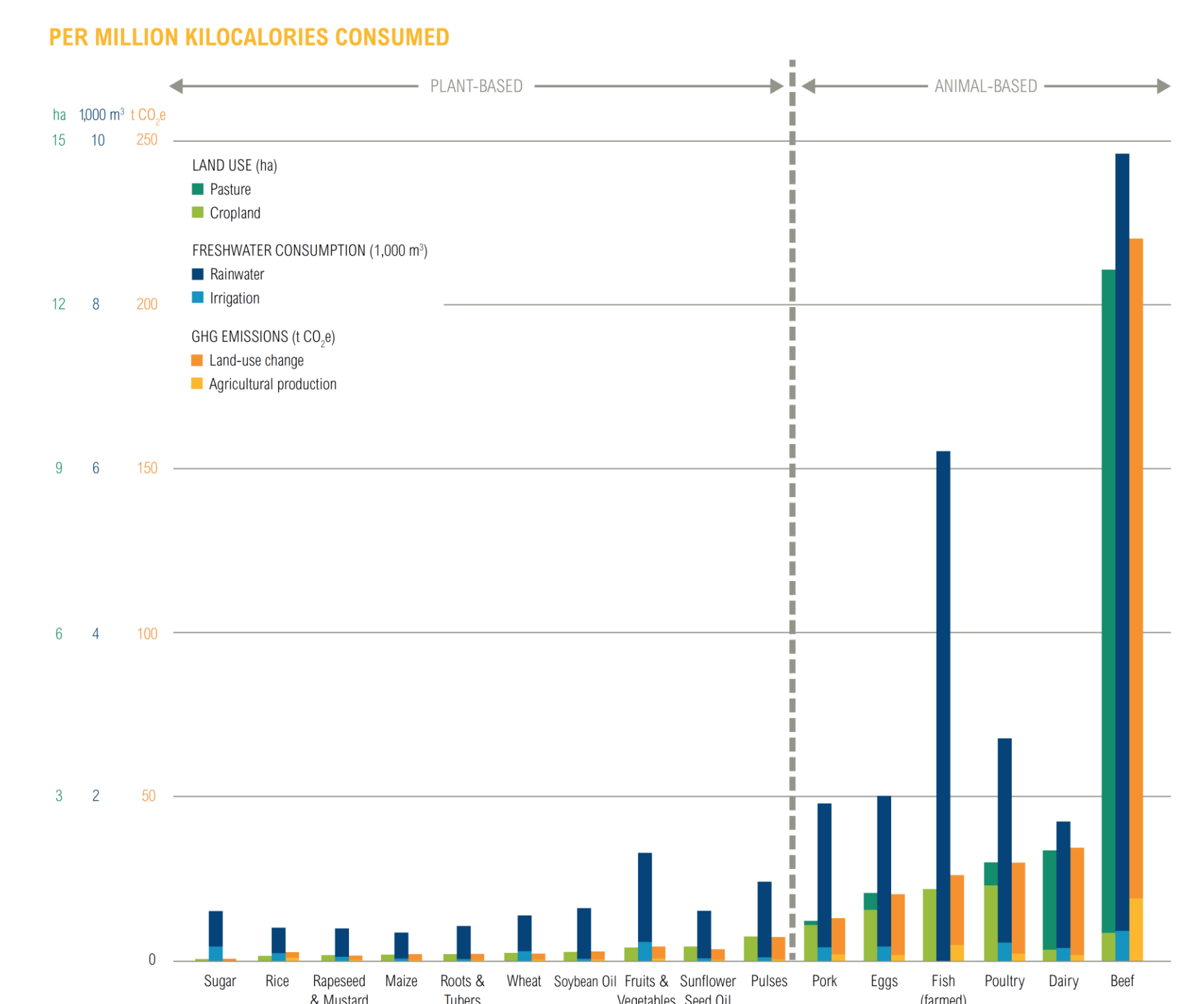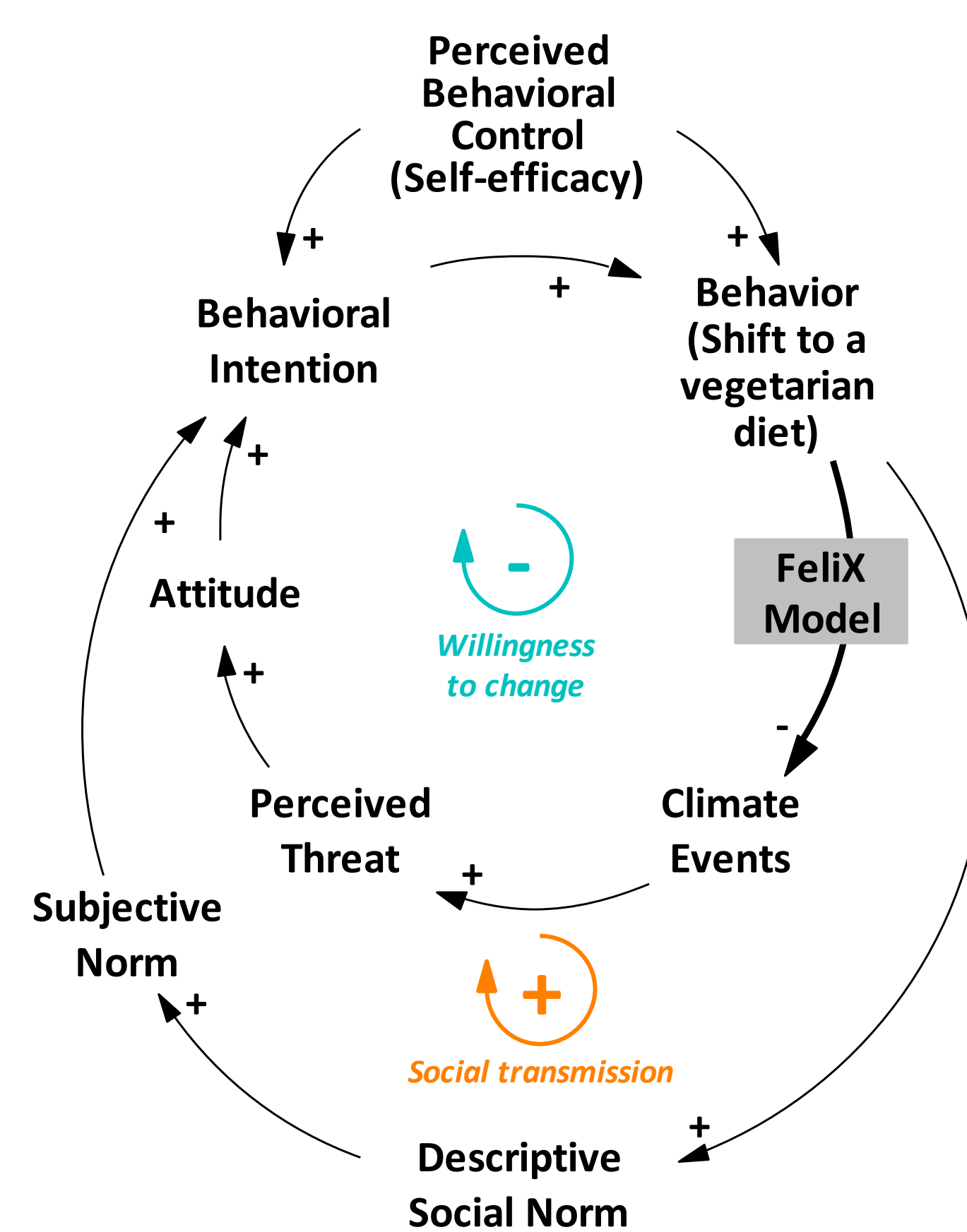

Source: World Resources Institute [6]

II) In this study…

We explore the behavioral factors behind diet change instead of stylized diet composition scenarios.

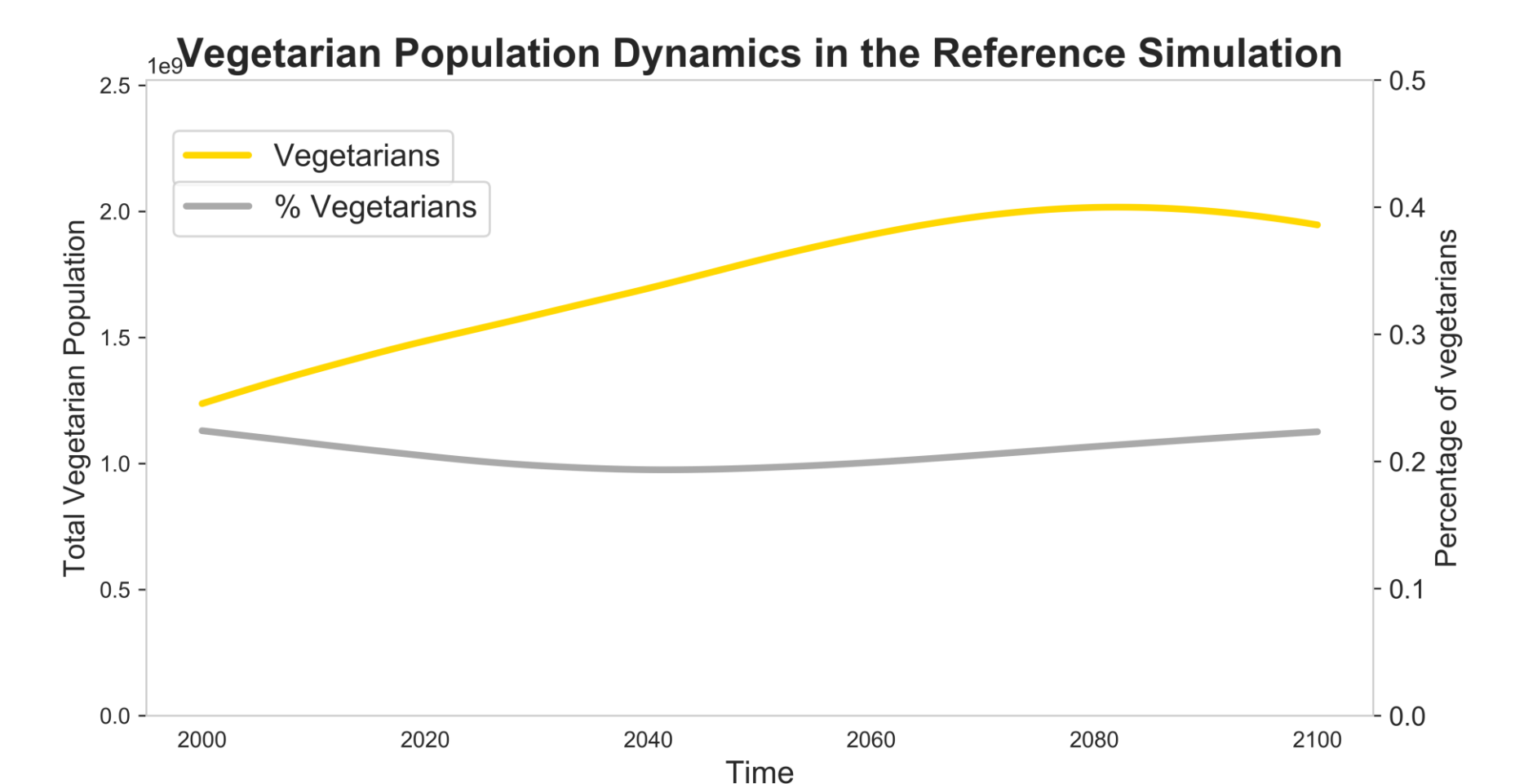We link a behavioral diet shift model to an integrated assessment model [6,7].

We identify the main drivers of global diet change and explore their implications for the food system.
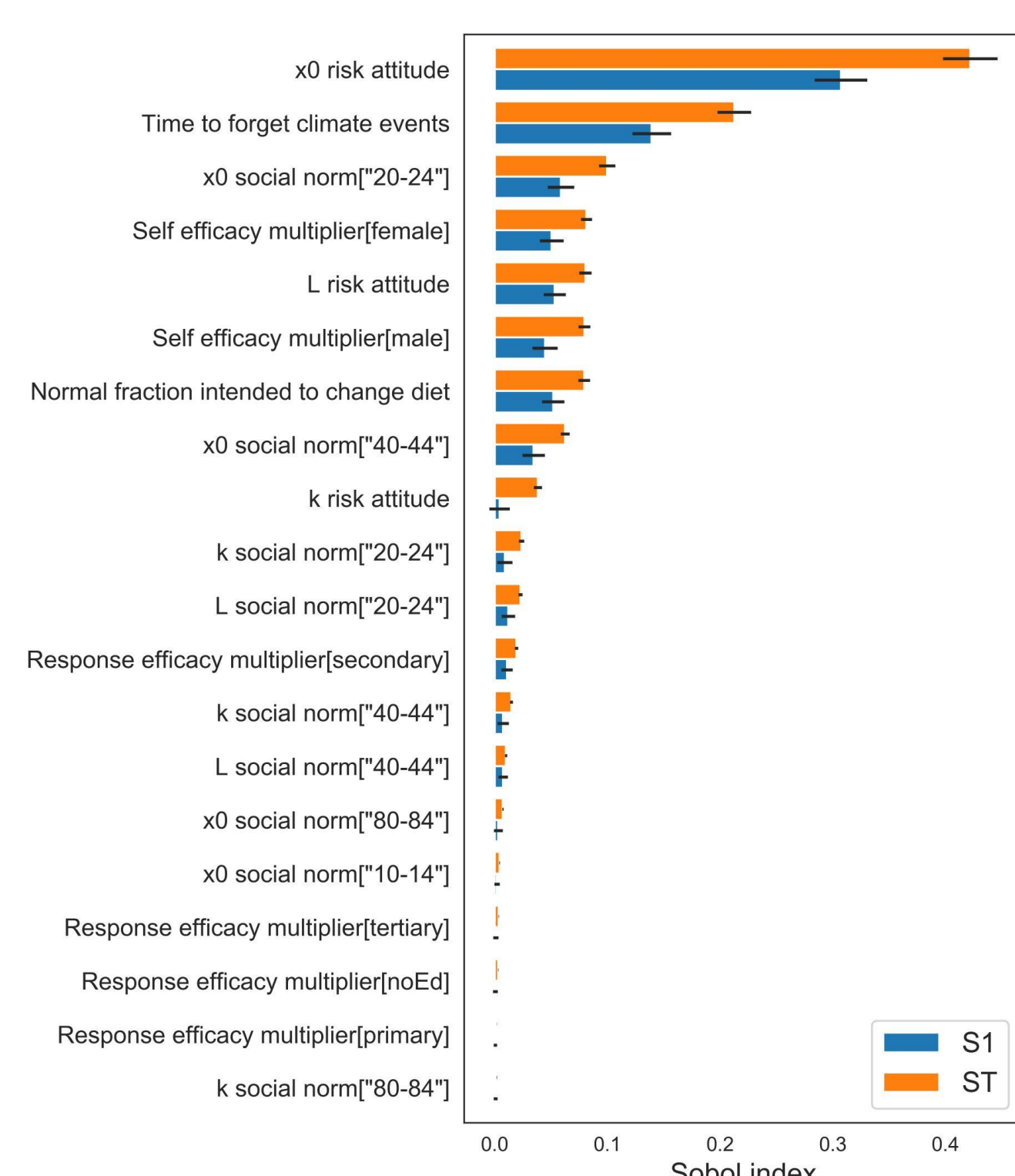

III) Behavioral framework

Theory of Planned Behavior (TPB)

Protection Motivation Theory (PMT)

Vegetarian Population Dynamics in the Reference Simulation

IV) Results

Sobol sensitivity indices

The figure shows the first-order (S1) and total (ST) Sobol index of each model input, i.e. the contribution to the variance of the model output for the global percentage of vegetarians.
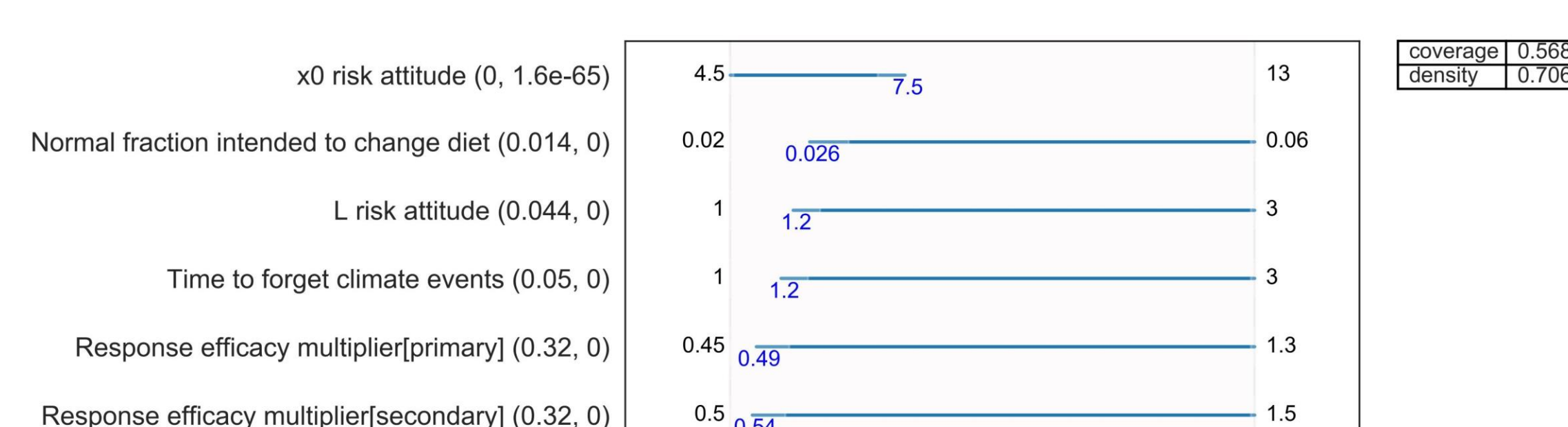
The parameter 'x0 risk attitude' that defines the **rapidness of the relation between risk perception and attitude towards diet change** is the most influential one.

Time to forget climate events, i.e. the average duration climate events remain in the public memory is the second factor, followed by the rapidness of the young population's response to social norms.

The factors that determine *Perceived Threat*, for instance, the **number of events** that trigger change or **time to forget** the past events, are most influential on long-term diet change dynamics.

Exploring behavioral factors is important for understanding and forming the pathways to SDG achievement.

References

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Scenario discovery for low Total Agricultural and Land Use Emissions

The length of each line represents the subset of the corresponding parameter's uncertainty range leading to low-emission scenarios.

The number of climate events that trigger a rapid behavioural response (x0 risk attitude) and time to forget climate events are the most distinguishing factors.