<u>Calibrated statements for nutrition security (nutrition security = achieving population-level requirements)</u> for *climate scenarios*

General considerations for the interpretation of nutrition outcomes:

1. Only a small number of crops were modelled: *maize, soyabeans, potatoes & groundnuts*
2. FAO Food Balance Sheet data are 'supply' not 'consumption' data & data are reported by country and the quality can vary widely between countries

<u>Malawi</u> (policy)	**Self Sufficiency (no imports/exports)**	**Business as usual (trade unchanged)**	**Stakeholder expectations for trade 2050**	**Trade optimisation**
Degrading Economy (low climate / LT)	Insufficient calories and nutrition security is not achieved for most nutrient (vitamin C marginal). Nutrients adequate at baseline fall below requirement. The pattern is similar for all non-optimised trade vignettes.	*Same as Self Sufficiency.*	*Same as self Sufficiency.*	Sufficient calories and nutrition security achieved.
Path to Heaven (Low climate / HT)	Sufficient calories and nutrition security is achieved for most nutrient (zinc is marginal) and improve from baseline levels. The pattern is similar for all non-optimised trade vignettes.	*Same as Self Sufficiency*.	*Same pattern as Self Sufficiency* the except quantity of all nutrients is higher.	Sufficient calories and nutrition security achieved.
Road to Hell (High climate/LT)	Insufficient calories and nutrition security is not achieved for most nutrient (vitamin C marginal). Nutrients adequate at baseline fall below requirements. The pattern is similar for all non-optimised trade vignettes.	*Same pattern as Self Sufficiency*.	*Same as Self Sufficiency.*	Sufficient calories and nutrition security achieved.
Demanding but coping (high climate/HT)	Sufficient calories and nutrition security is achieved for most nutrient (zinc and fat are marginal) and improve from baseline levels. The pattern is similar for all non-optimised trade vignettes.	*Sufficient calories and nutrition security is achieved for all nutrients and improve from baseline levels, except for fat which is inadequate and below baseline levels. Otherwise, quantity of*	*Same pattern as Business as Usual*.	Sufficient calories and nutrition security achieved.

		nutrients much higher than under self-sufficiency.		
Robustness*	Medium: The food composition tables are not country specific for Malawi rather food items taken from W. African and USDA tables, meaning a small number of local foods will not be covered. Weightings the food items in the disaggregated commodities were based on trade data rather than food consumption surveys, which is less accurate.			
Agreement				
Confidence	Nutrition + crop combination – to be discussed			

* These statements are based *only* on the robustness of the nutritional data available to build the dataset in ifeed (this varies by country not quadrants), but overall, it will also depend the robustness of the data inputted in the TNT models (e.g. crop modelling outputs). The combined is not considered here.

Tanzania (technology)	**Self Sufficiency (no imports/exports)**	**Business as usual (trade unchanged)**	**Stakeholder expectations for trade 2050**	**Trade optimisation**
Human Capital (Low climate /LT)	Insufficient calories and nutrition security is not achieved for most nutrients (vitamin C is achieved and thiamine is marginal) and all lower than baseline. Nutrients adequate at baseline fall below requirements. The pattern is similar for all non-optimised trade vignettes.	*Same as Self Sufficiency.*	*Same as Self Sufficiency.*	Sufficient calories and nutrition security achieved.
Technofix (Low climate / HT)	Sufficient calories and nutrition security is achieved for most nutrients and improve from baseline levels (marginal improvement for iron and calcium but not adequate). The pattern is similar for all non-optimised trade vignettes.	*Same as Self Sufficiency* except iron is marginally adequate.	*Same as Self Sufficiency* except zinc is marginally adequate.	Sufficient calories and nutrition security achieved.
Climate Chaos (high climate / LT)	Insufficient calories and nutrition security is not achieved for most nutrients (vitamin C and thiamine marginal) and worse than baseline. Some nutrients adequate at baseline then fall below requirement. The pattern is similar for all non-optimised trade vignettes.	*Same as Self Sufficiency.*	*Same as Self Sufficiency* except thiamine and vitamin B6 are adequate.	Sufficient calories and nutrition security achieved.

Intensive Vulnerability (high climate / HT)	Sufficient calories and nutrition security is achieved for most nutrients with improvement from baseline levels (improvement but still marginal for calcium). The pattern is similar for all non-optimised trade vignettes.	*Same as Self Sufficiency.*	*Same as Self Sufficiency.*	Sufficient calories and nutrition security achieved.
Robustness*	**Medium**: The food composition tables are country specific for Tanzania, with a small number of foods from W. African and USDA tables, meaning most local foods are covered. Weightings the food items in the disaggregated commodities were based on household budget survey so reasonably representative.			
Agreement				
Confidence	Nutrition + crop combination – to be discussed			

* These statements are based *only* on the robustness of the nutritional data available to build the dataset in ifeed (this varies by country not quadrants), but overall, it will also depend the robustness of the data inputted in the TNT models (e.g. crop modelling outputs). The combined is not considered here.

Zambia (markets)	**Self Sufficiency (no imports/exports)**	**Business as usual (trade unchanged)**	**Stakeholder expectations for trade 2050**	**Trade optimisation**
Solitude and Self Sufficiency (Low climate / LT)	Insufficient calories and nutrition security is not achieved for all nutrient and worse than baseline. Nutrients adequate at baseline fall below requirement. The pattern is similar for all non-optimised trade vignettes.	*Same as Self Sufficiency.*	*Same as Self Sufficiency.*	Sufficient calories and nutrition security achieved.
Opportunity and Exposure (Low climate / HT)	Insufficient calories and nutrition security is not achieved for most nutrients (protein marginal). Vitamin C, B6 and thiamine adequate. Most nutrients worse than baseline. The pattern is similar for all non-optimised trade vignettes.	*Insufficient calories and nutrition security is not achieved for most nutrients. Protein, vitamin C, and all B vitamins adequate. Most nutrients worse than baseline.*	*Same as Business as usual*	Sufficient calories and nutrition security achieved.
Isolation and imperative	Insufficient calories and nutrition security is not achieved for all nutrients and worse than baseline.	*Same as Self Sufficiency.*	*Same as Self Sufficiency.*	Sufficient calories and nutrition security achieved.

(High climate / LT)	The pattern is similar for all non-optimised trade vignettes.			
Risk and Reward (High climate / HT)	Insufficient calories and nutrition security is not achieved for most nutrients (except thiamine and vitamin B6) and similar to baseline. The pattern is similar for all non-optimised trade vignettes.	Sufficient calories but only adequate in B vitamins and protein.	Sufficient calories and adequate in B vitamins, folate, zinc and protein.	Sufficient calories and nutrition security achieved.
Robustness *	**Medium**: The food composition tables are not country specific for Zambia, with a small number of foods from W. African and USDA tables, meaning not all local foods are covered. Weightings the food items in the disaggregated commodities were based on household expenditure survey which will be less accurate than consumption data for this purpose.			
Agreement				
Confidence	Nutrition + crop combination – to be discussed			
* These statements are based *only* on the robustness of the nutritional data available to build the dataset in ifeed (this varies by country not quadrants), but overall, it will also depend the robustness of the data inputted in the TNT models (e.g. crop modelling outputs). The combined is not considered here.				
South Africa (land reform)	**Self Sufficiency (no imports/exports)**	**Business as usual (trade unchanged)**	**Stakeholder expectations for trade 2050**	**Trade optimisation**
Familiar futures (Low climate / LT)	Sufficient calories and nutrition security is achieved for most nutrients and are similar baseline levels (except calcium and iron remain inadequate). The pattern is similar for all non-optimised trade vignettes.	*Same as Self Sufficiency.*	*Same as Self Sufficiency.*	Sufficient calories and nutrition security achieved.
Structural Change (Low climate / HT)	Sufficient calories and nutrition security is achieved for most nutrients and are similar baseline levels (except calcium and iron remain inadequate). The pattern similar for all non-optimised trade vignettes.	*Same as Self Sufficiency.*	*Same as Self Sufficiency.*	Sufficient calories and nutrition security achieved.

Hot and Bothered (High climate / LT)	Sufficient calories and nutrition security is achieved for most nutrients and slight improvement from baseline levels (except calcium and iron remain inadequate). The pattern is similar for all non-optimised trade vignettes.	*Same as Self Sufficiency.*	*Same as Self Sufficiency.* Except calcium remains inadequate.	Sufficient calories and nutrition security achieved.
All Change (High climate / HT)	Sufficient calories and nutrition security is achieved for most nutrients and slight improvement from baseline levels (except calcium and iron remain inadequate). The pattern is similar for all non-optimised trade vignettes.	*Same as Self Sufficiency.*	*Same as Self Sufficiency.* Except only calcium remains inadequate (iron is marginal).	Sufficient calories and nutrition security achieved.
Robustness*	**Medium**: The food composition tables are country specific for South Africa, only a small number of foods from W. African and USDA tables, meaning local foods are covered. Weightings the food items in the disaggregated commodities were based on household budget but not nationally representative.			
Agreement				
Confidence	Nutrition + crop combination – to be discussed			
* These statements are based *only* on the robustness of the nutritional data available to build the dataset in ifeed (this varies by country not quadrants), but overall, it will also depend the robustness of the data inputted in the TNT models (e.g. crop modelling outputs). The combined is not considered here.				

Trade vignettes

1. **Self sufficiency: Depicts a situation with no imports or exports, demonstrating:**
    - Extent to which domestic production can meet nutritional requirements if international trade is eliminated
    - Which nutrients have the largest production deficiencies given domestic requirements
    - Which, if any, nutrient surpluses are available for export without impinging on nutrient security
2. **Business as usual: Proportionally, baseline patterns of trade and domestic supply are unchanged, to illustrate:**
    - How well current trading relationships may stand up to future needs

- How much proactive effort is required to increase (domestic/imported) supplies of certain nutrients

3. **Stakeholder expectations:** A taskforce of in-country experts was asked to signal expectations about 2050 import and export dynamics for each scenario quadrant. Their increase/decrease/no-change expectations were quantified unilaterally by the core iFEED team across all food items relative to BAU proportions. These can be adjusted in aggregate or on a per commodity basis if preferred.

   e.g. BAU: 20% of item produced in-country is exported. 50% increase under stakeholder expectations = 30% of item's production is exported.

4. **Trade optimisation of nutrition security**

   - Achieves population-level nutrition requirements by making the smallest possible changes to current food imports and by being culturally sensitive to national dietary patterns
   - Indicates potential trade dependencies required to achieve nutrition security given domestic production outcomes