Food Security ,sustainable development and virtual water

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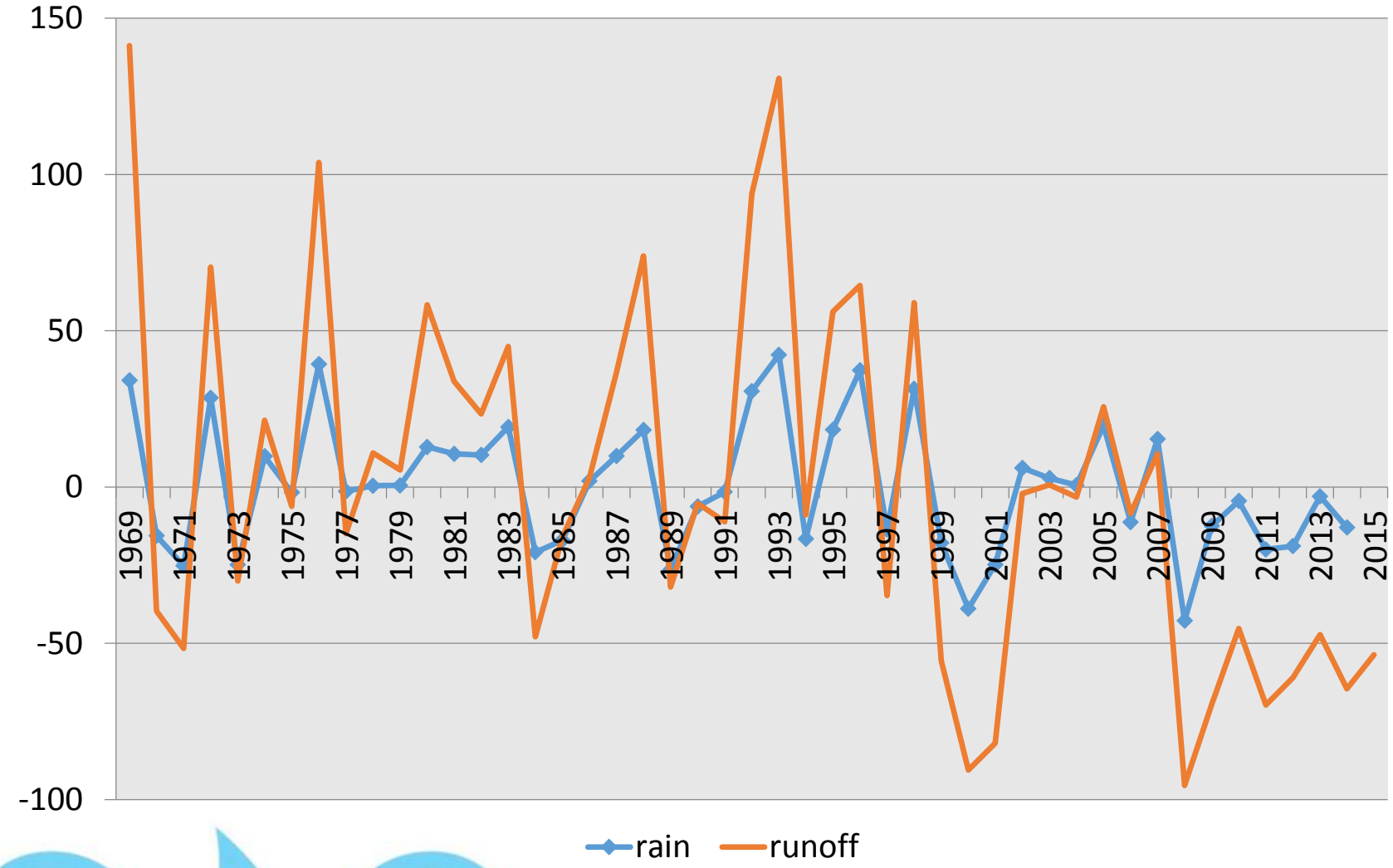
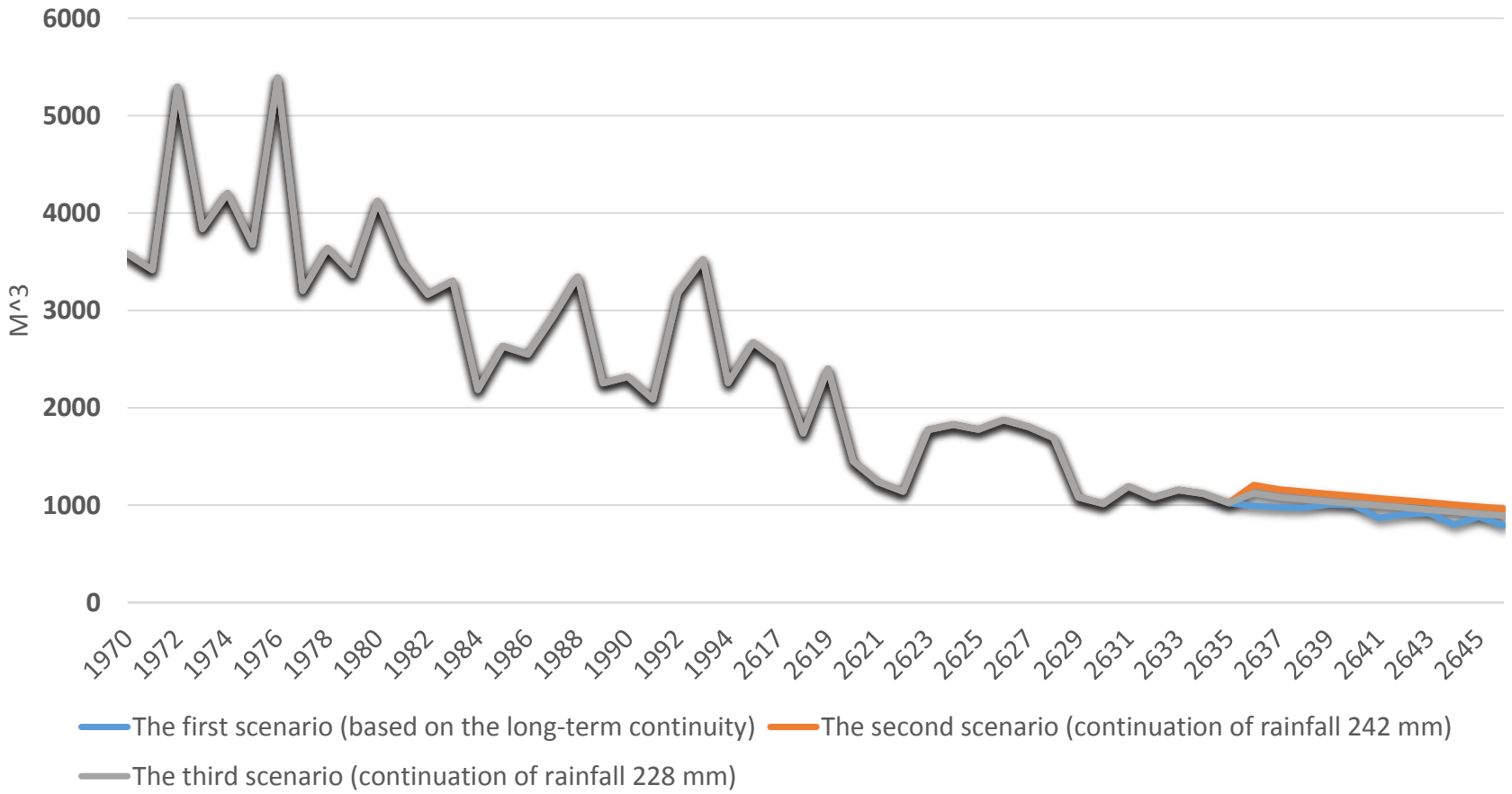
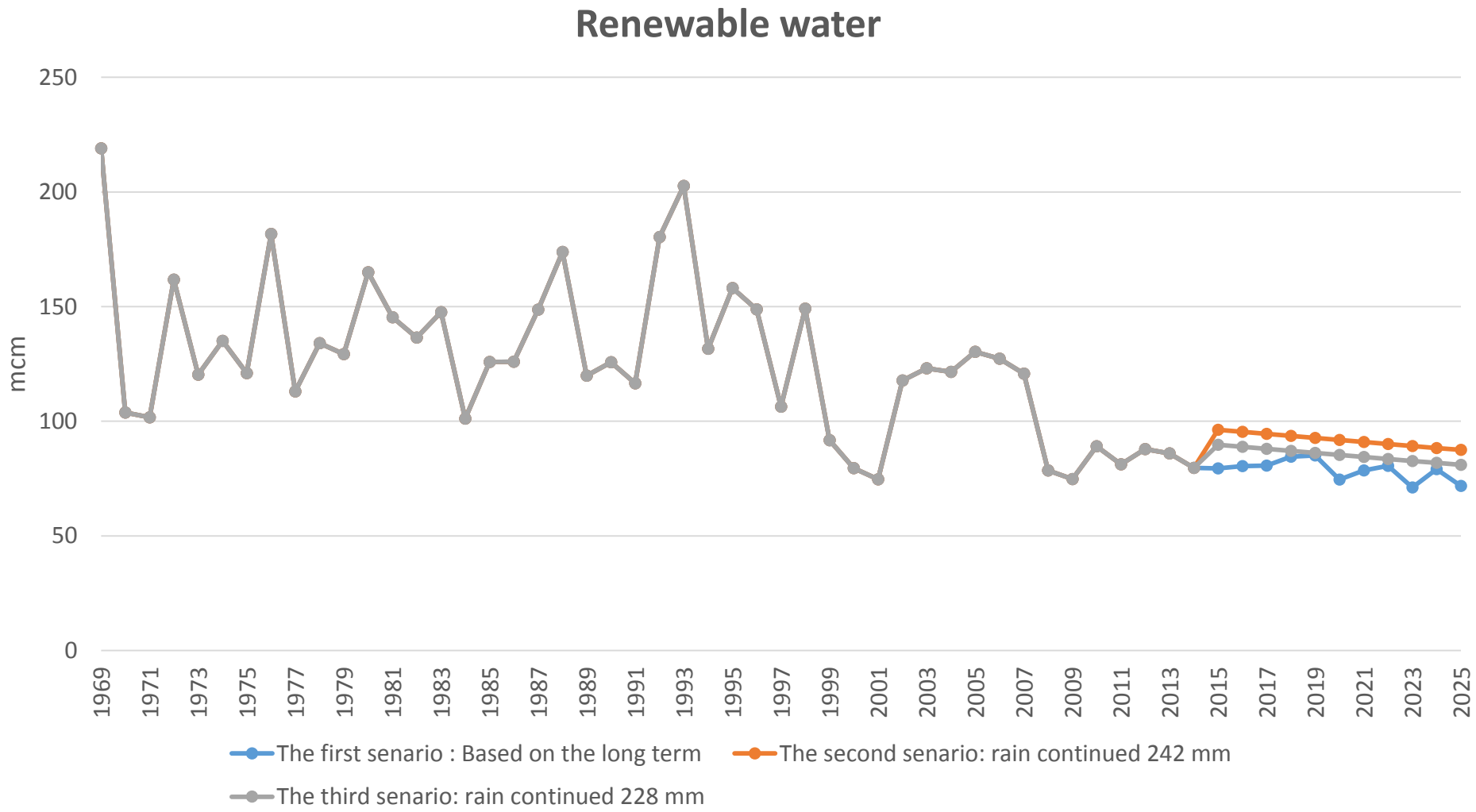
Changes in rainfall-runoff compared to the average 47 year with assuming hundred as moderate



Per capita water resources



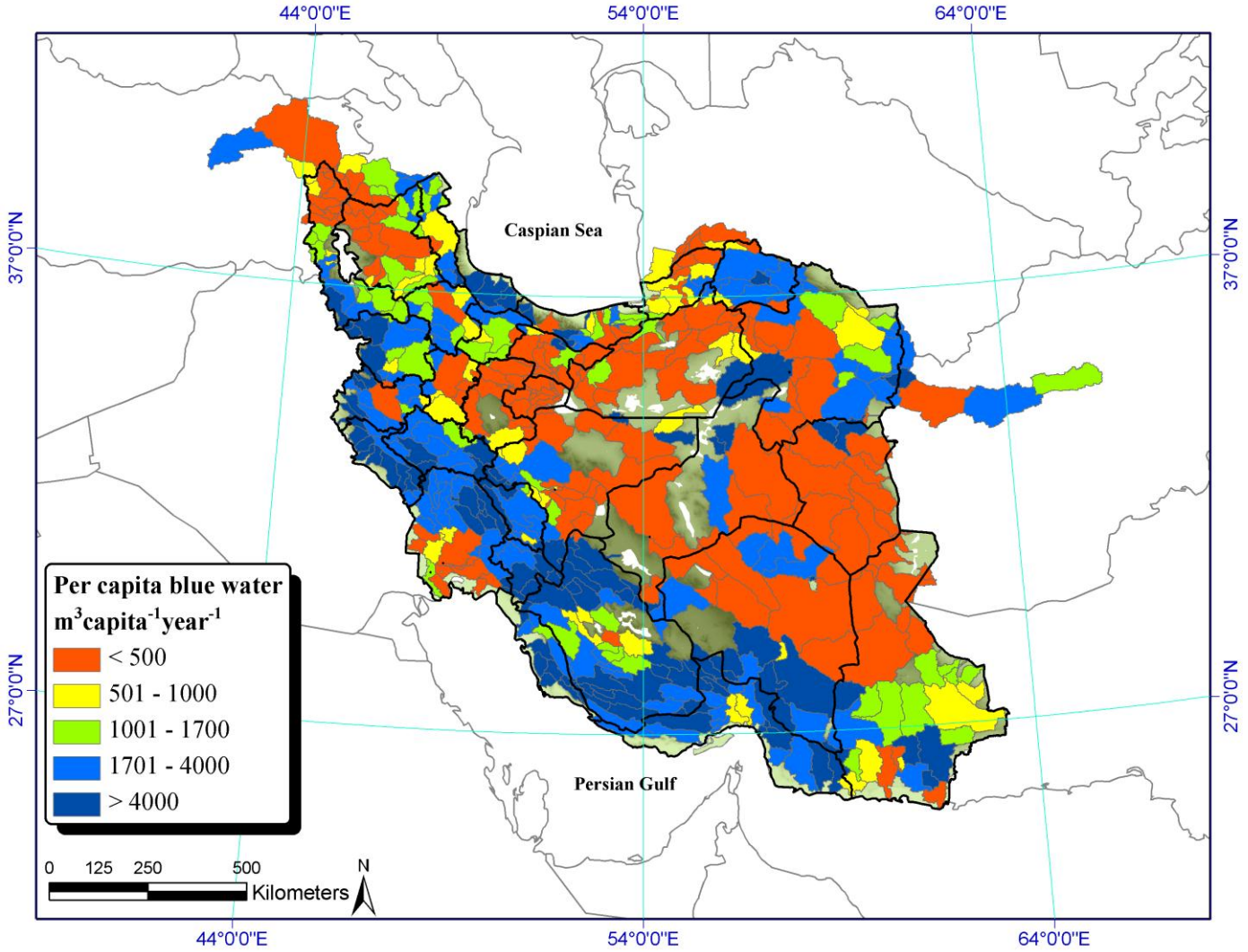
Due to drop and imbalanced in groundwater resources, water resources per capita would be less than this amount



In 2014, Center estimated the water resource will be increased and in 2015 energy Ministry has confirmed.

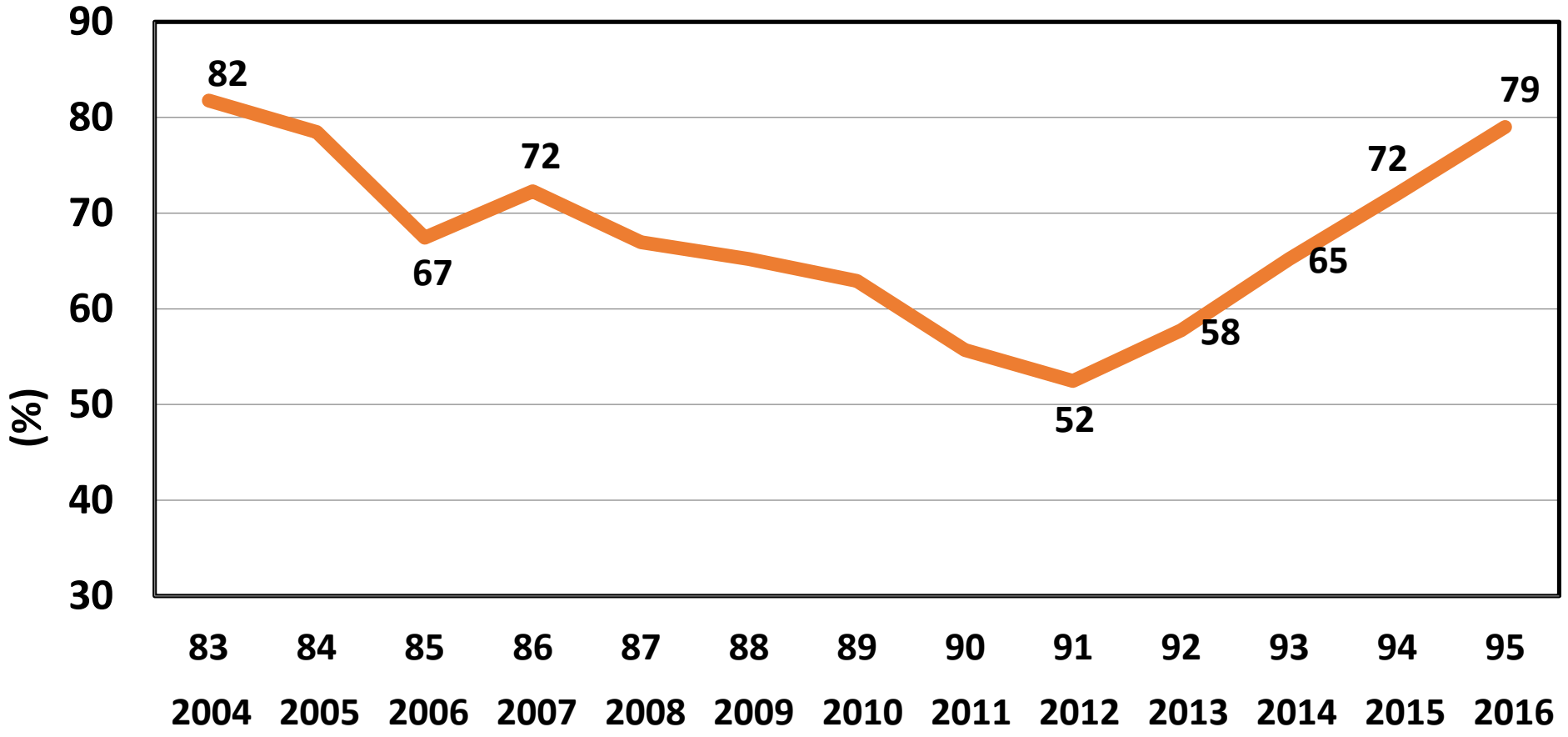
Distribution of per capita blue water resources for the period of 1980 – 2002 based on the population of 2005.

Values of <500 indicate severe water stress
<1000 are high water stress
1700 is water stress threshold and
>1700 indicates adequate water availability.



Faramarzi, M., 2009. Hydrological Processes

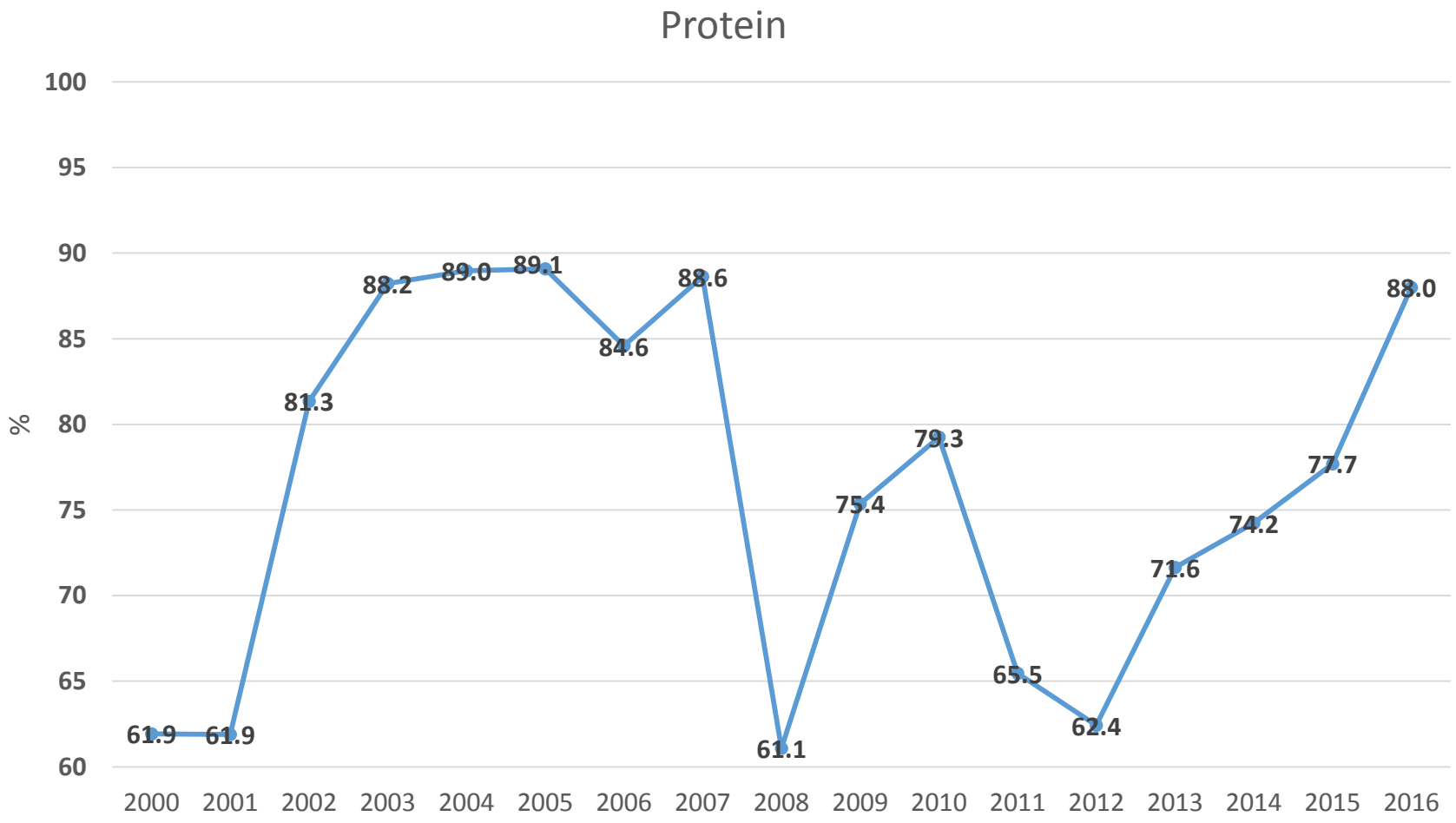
Self-sufficiency in per capita supply of energy delivered from agricultural production and import (2004-2016)



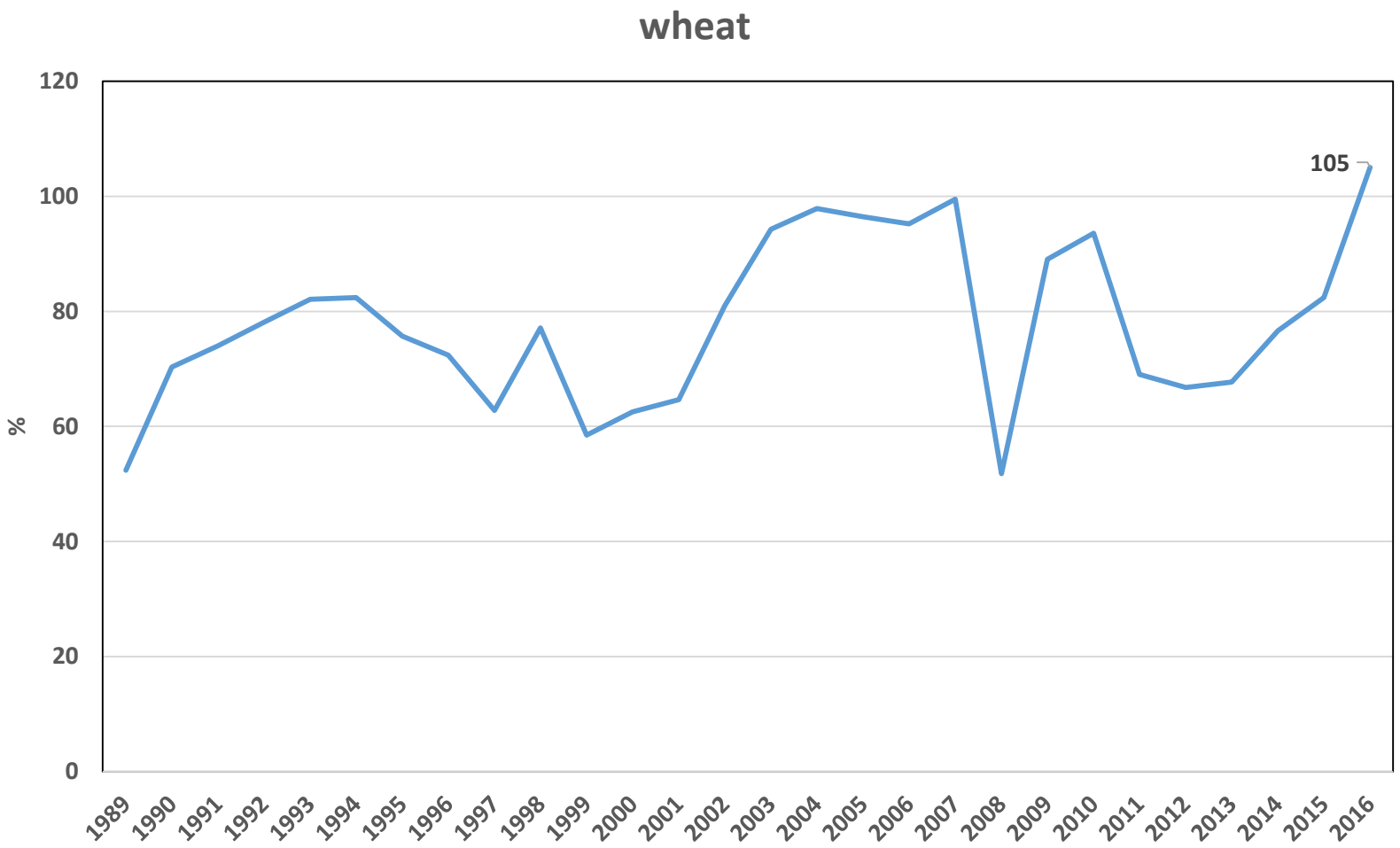
* By considering increasing in wheat and sugar production and no change in other products in 2016

Source: National Strategic Research Center of Water and Agriculture

Self-sufficiency in Protein delivered from agricultural production and import (2004-2016)



Changes of self sufficiency in principal agricultural products



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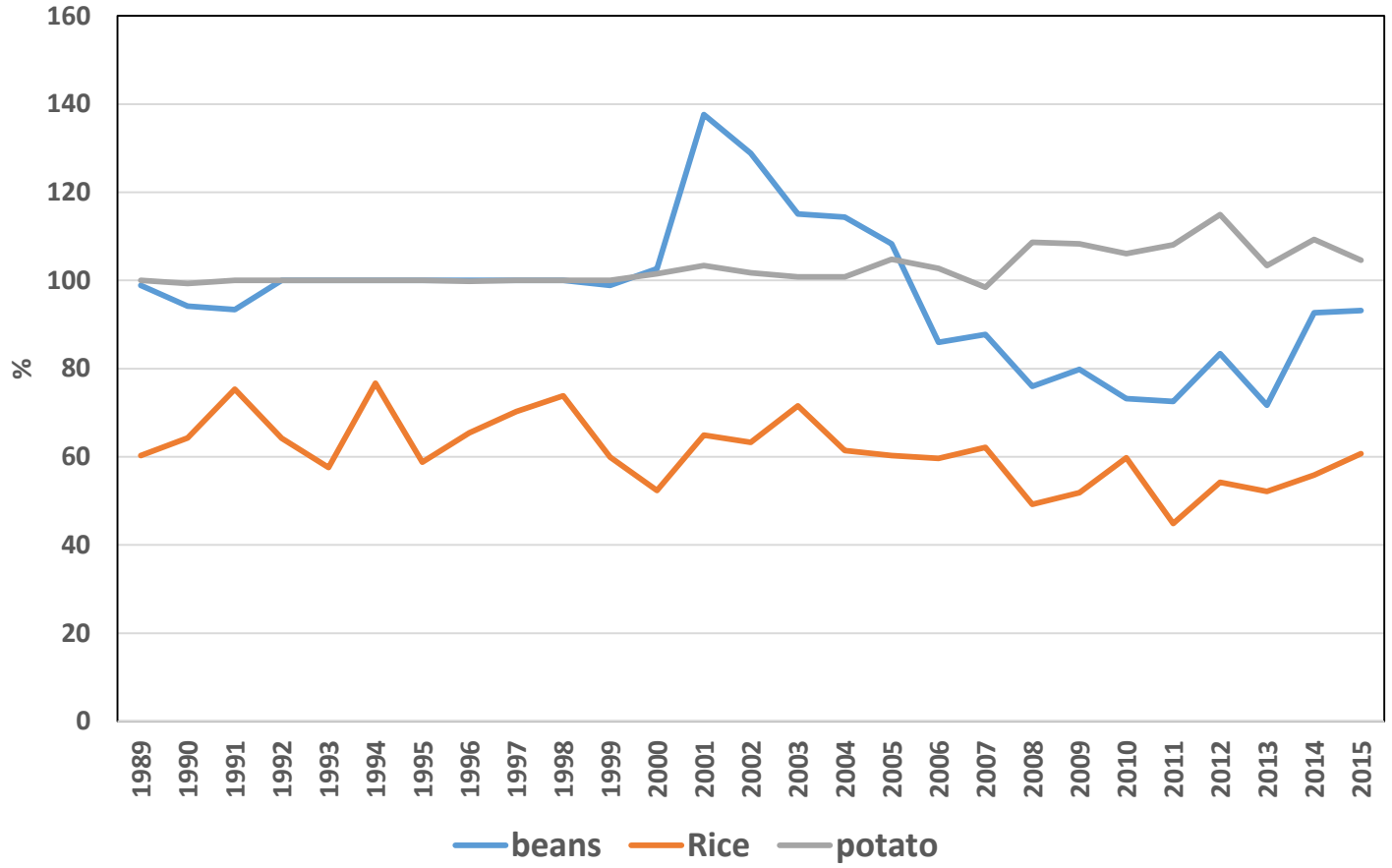

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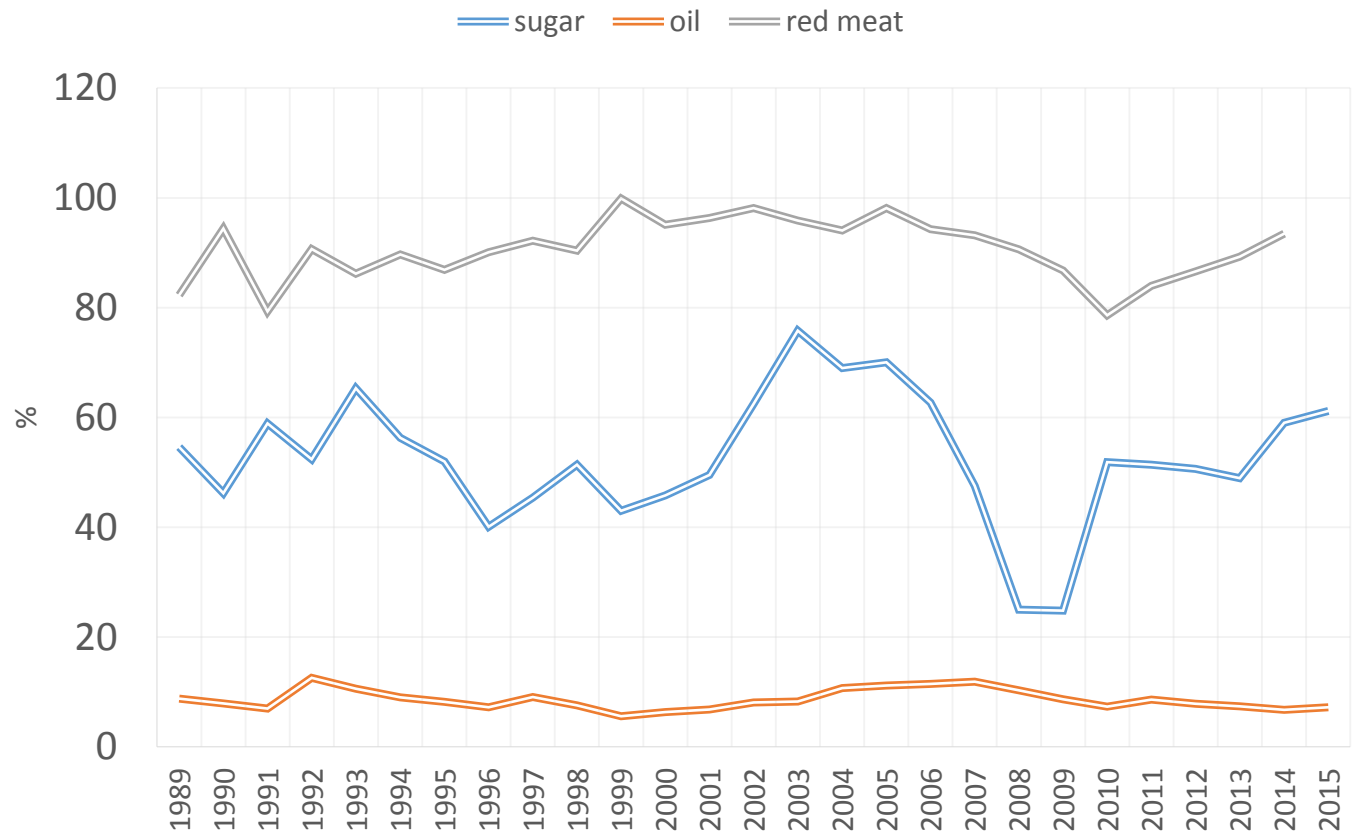
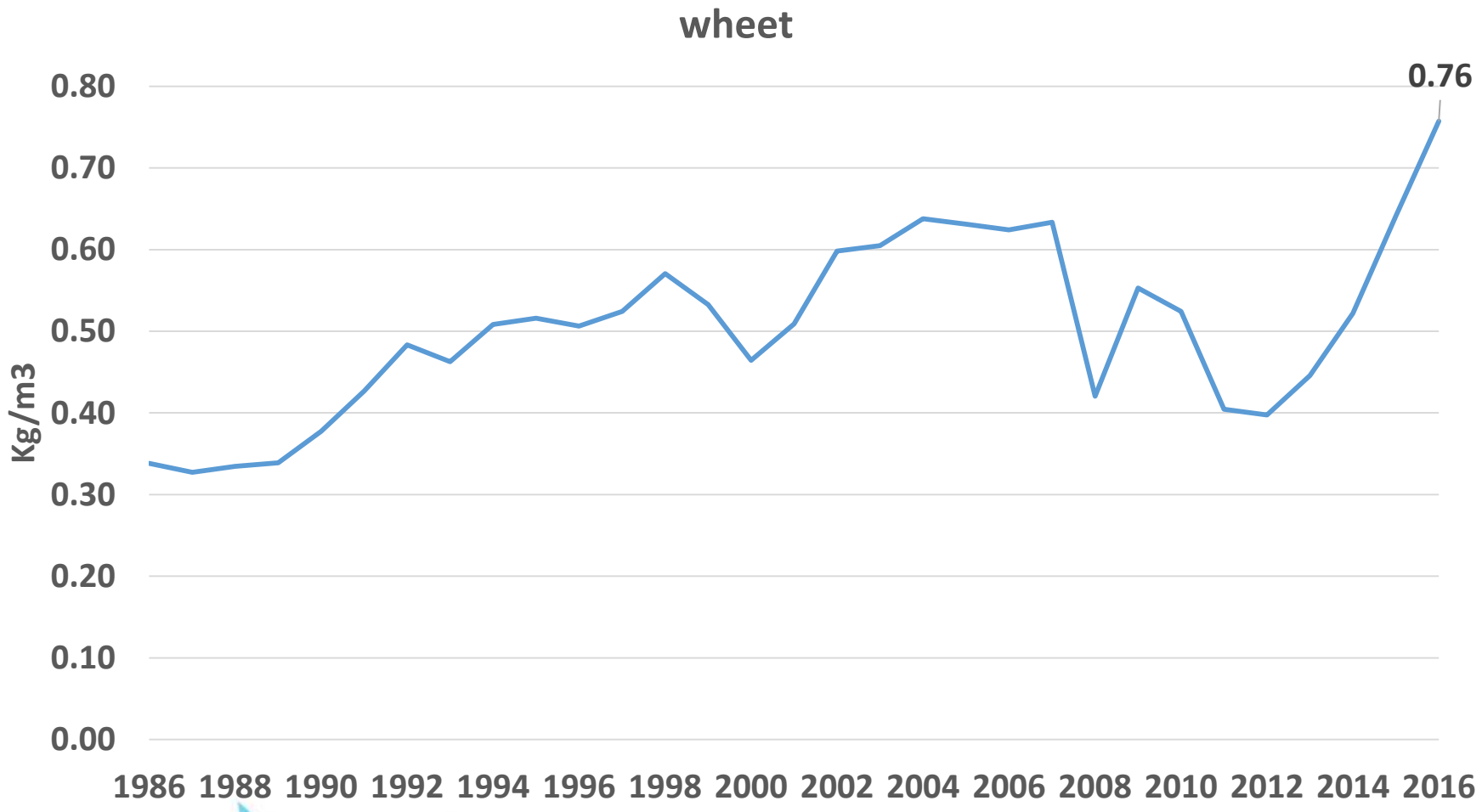
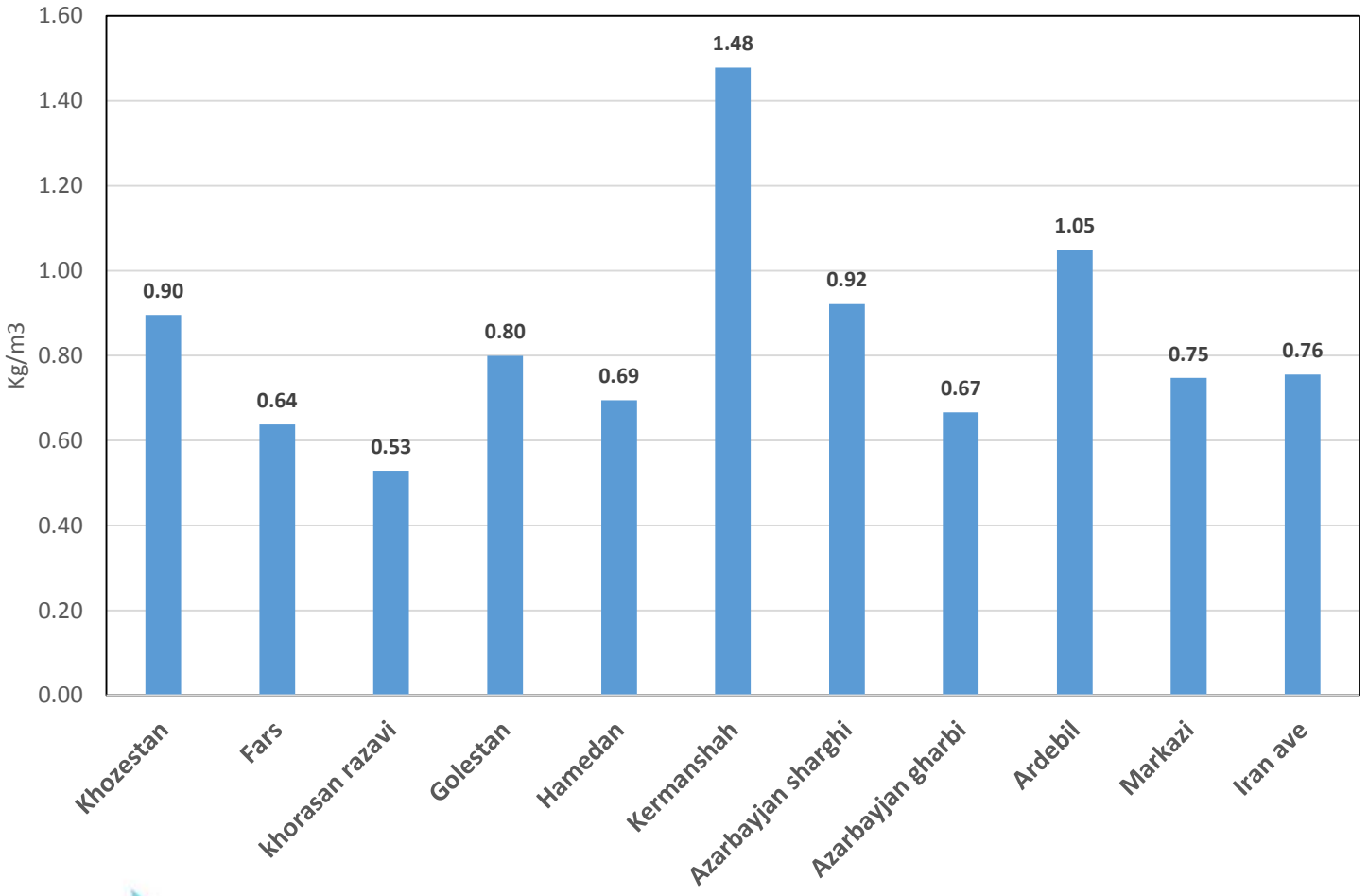


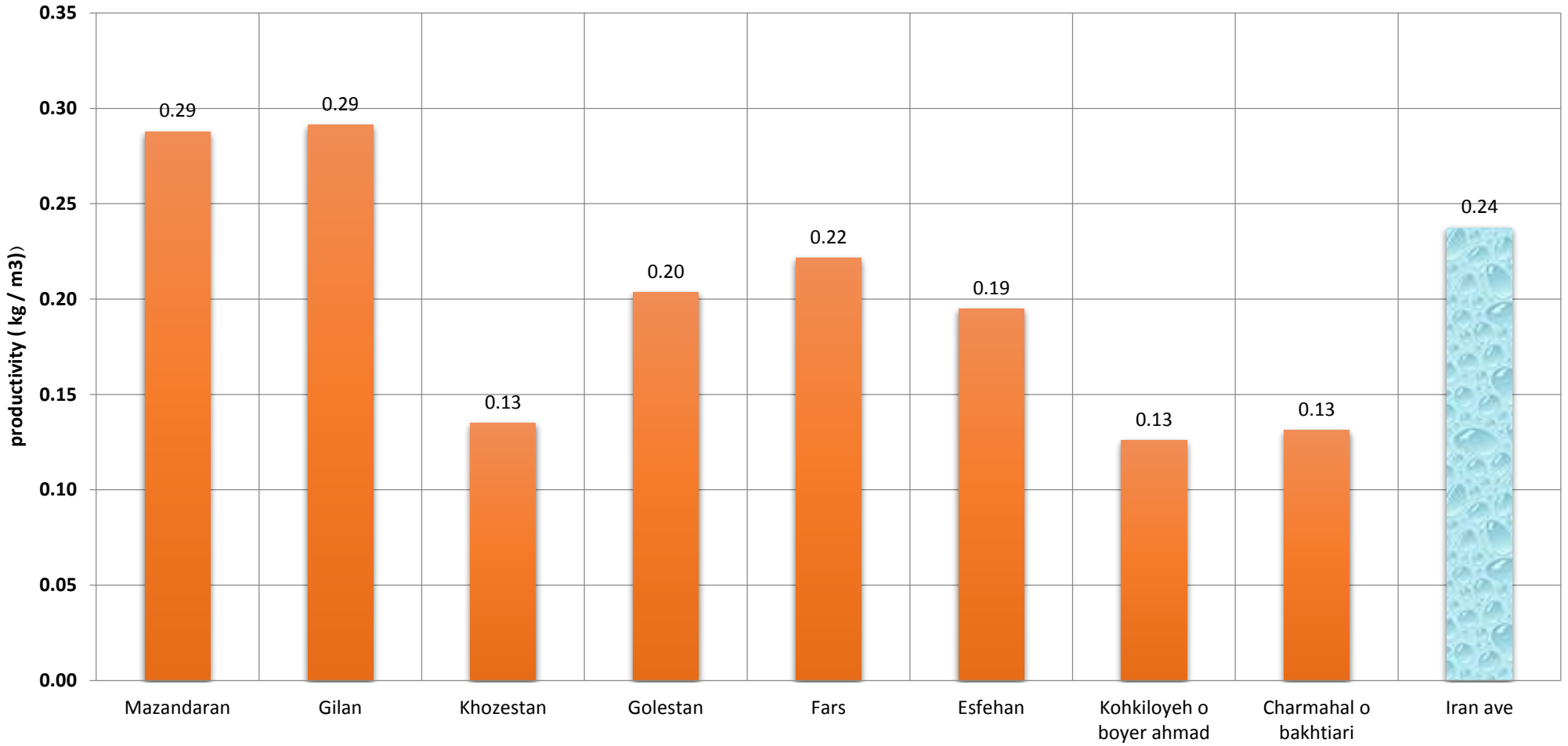
Temporal Variation of Wheat Water Productivity During 1985 to 2016



Wheat water productivity in major area

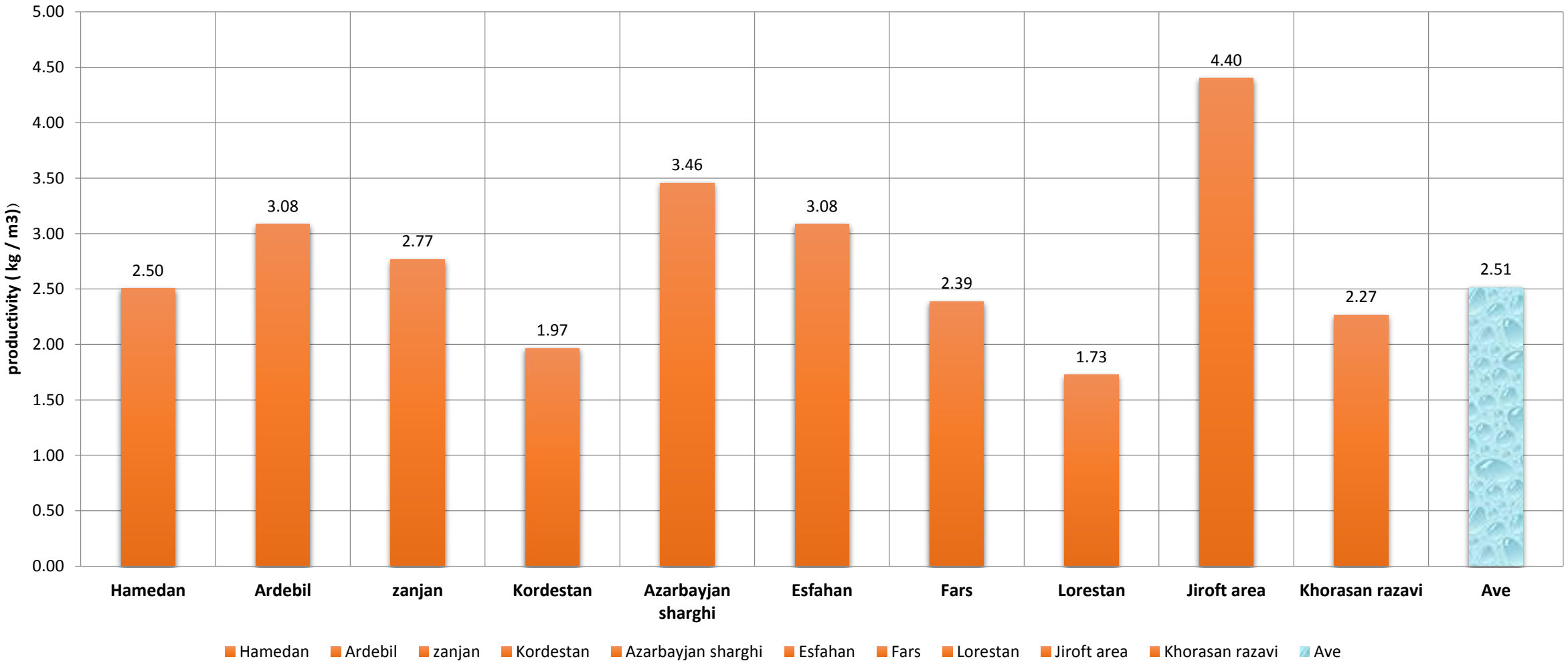


Rice water productivity in major area



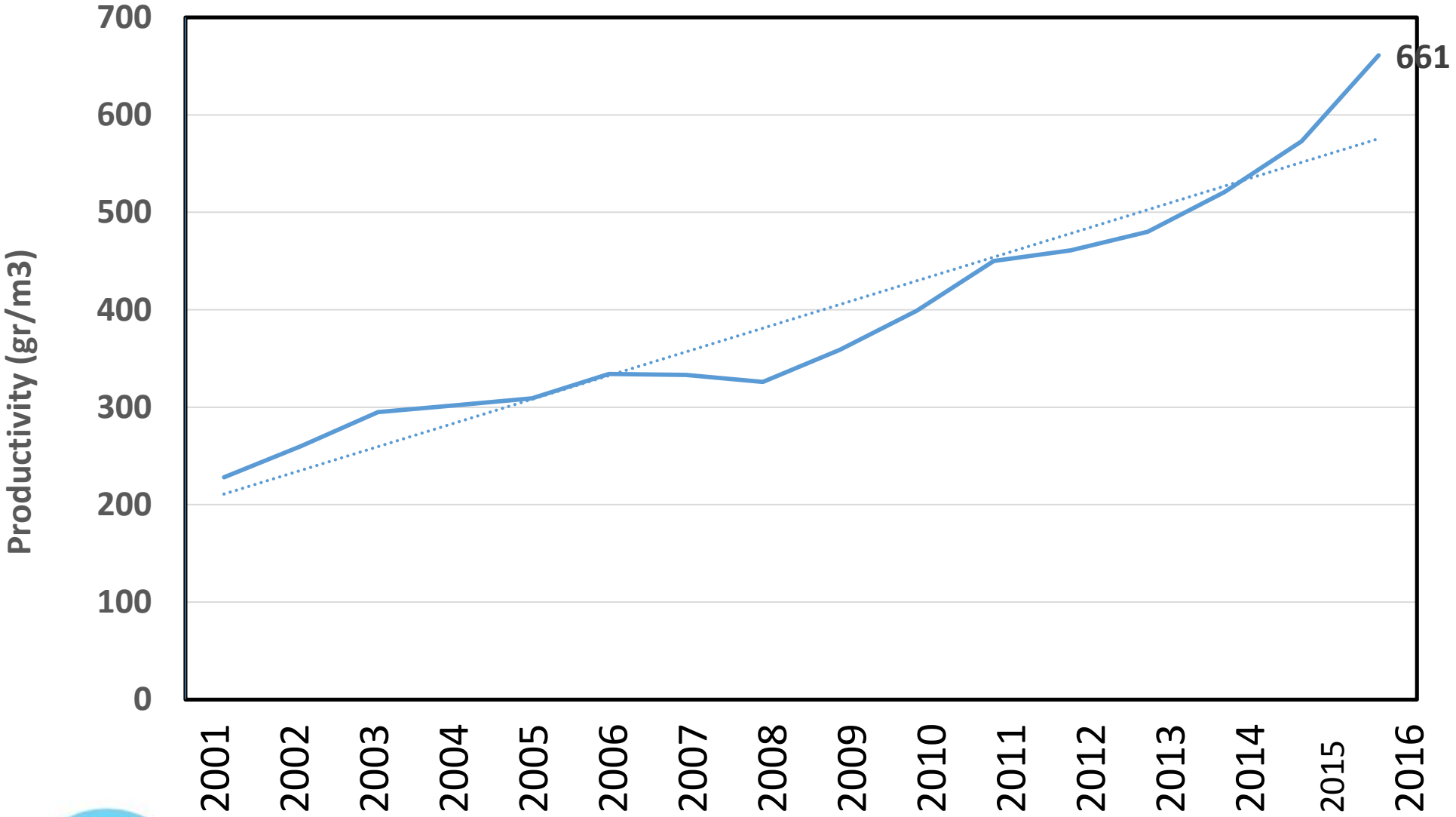
Reduce the rice cultivation and cultivate it only in north province by focusing on increasing self-sufficiency

Potato water productivity in major area

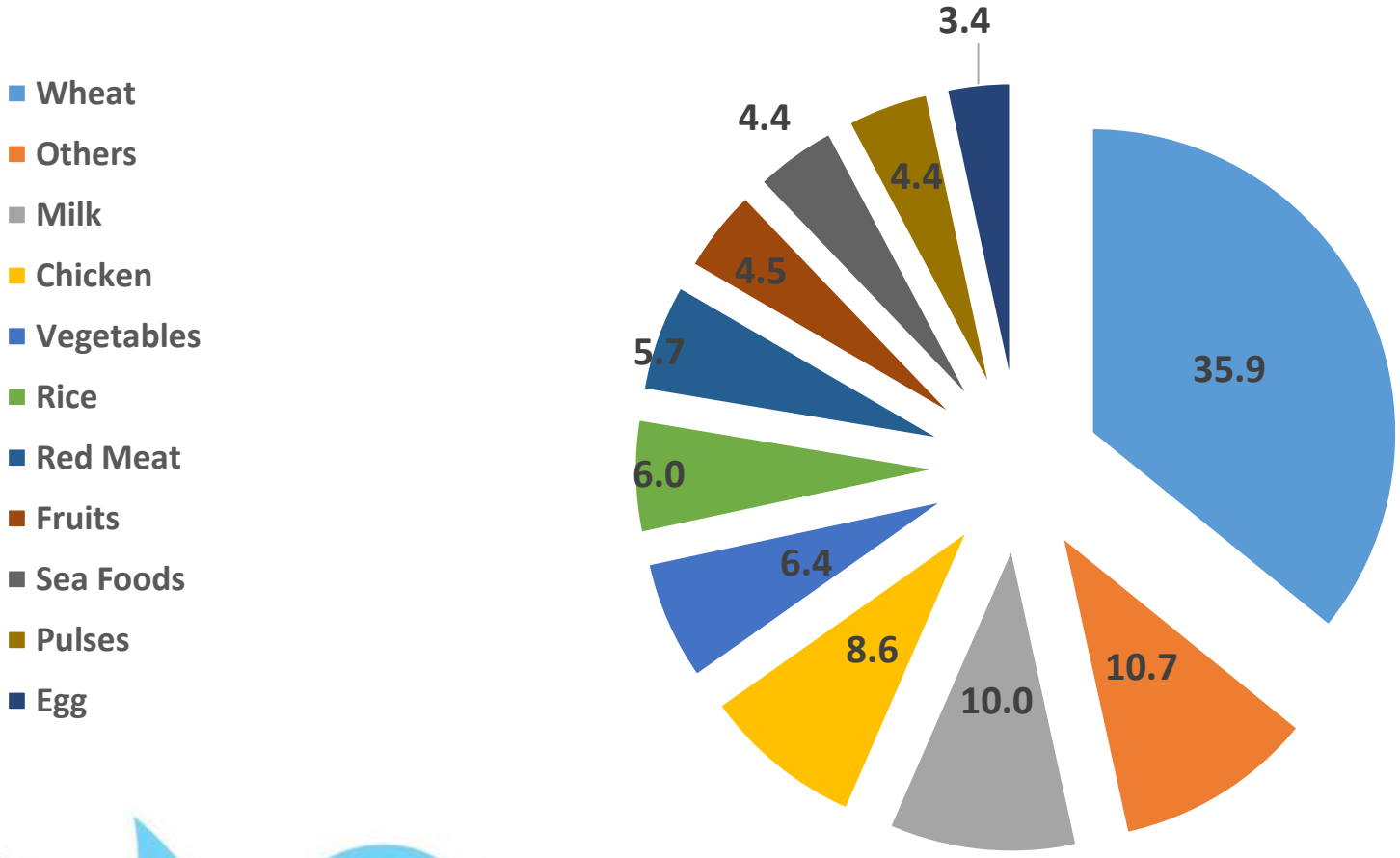


Word water productivity (F.A.O,2007) : 4.44

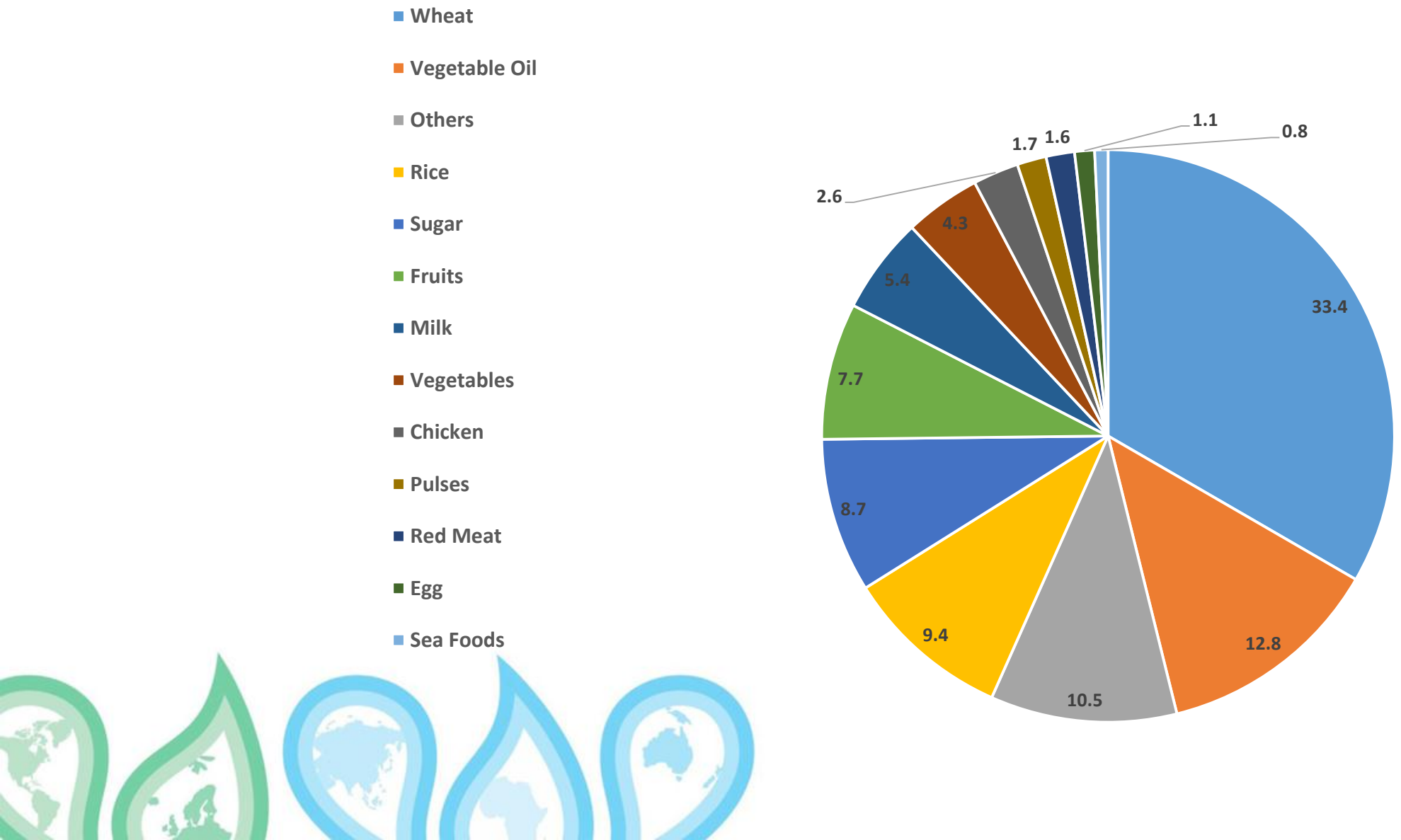
Temporal Variation of Sugar Beet Productivity During 2001to 2016



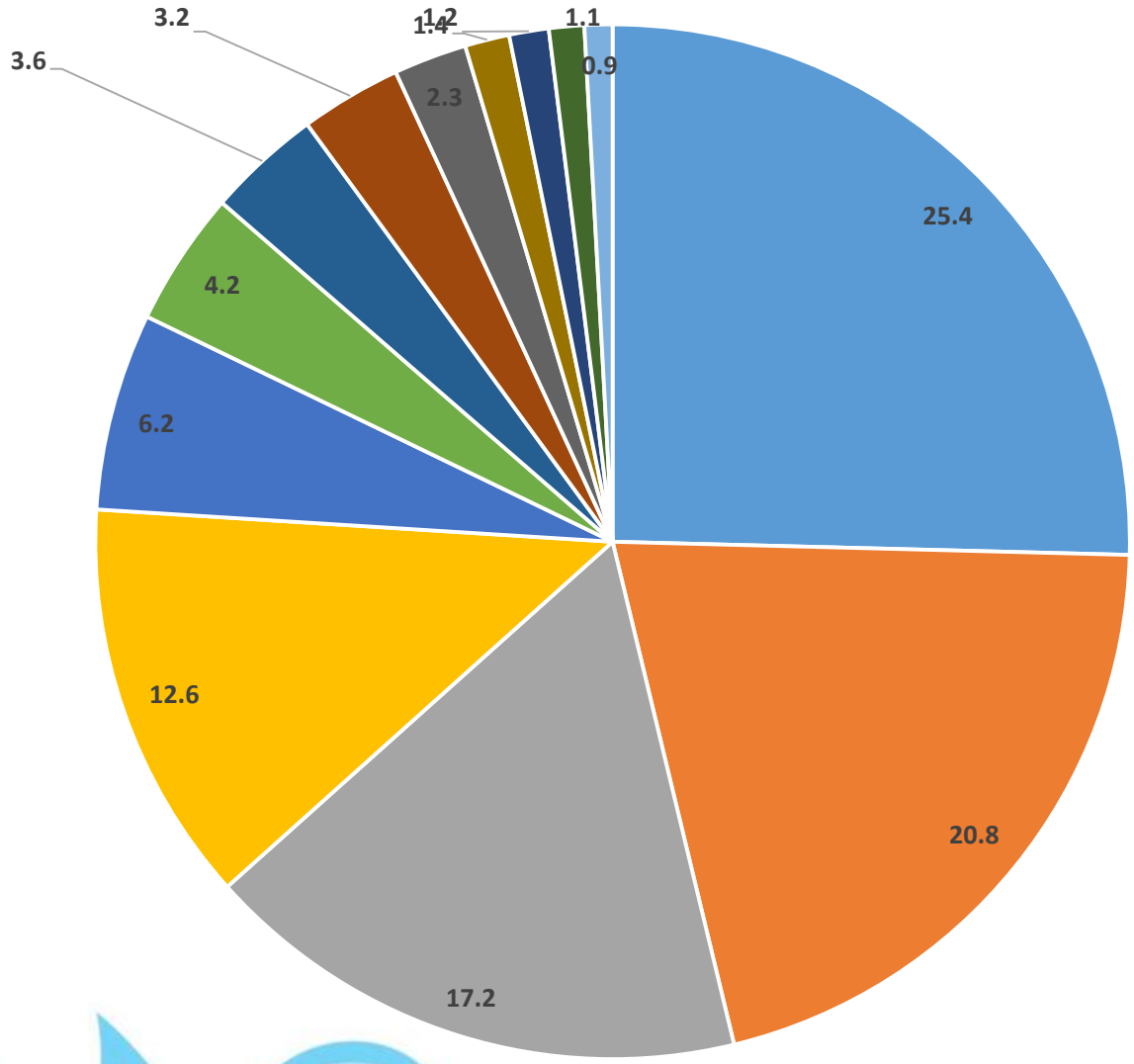
Share of products in the supply of daily protein per capita (%)



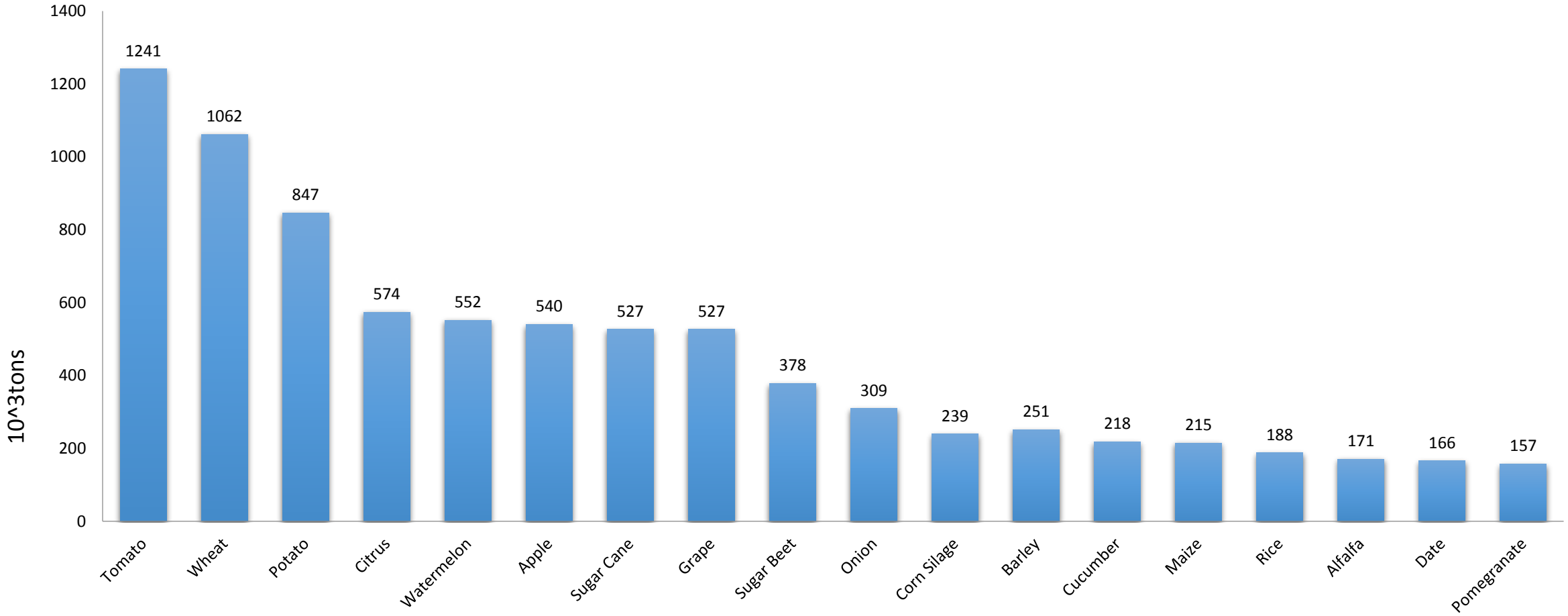
Share of products in the supply of daily Calorie per capita (%)



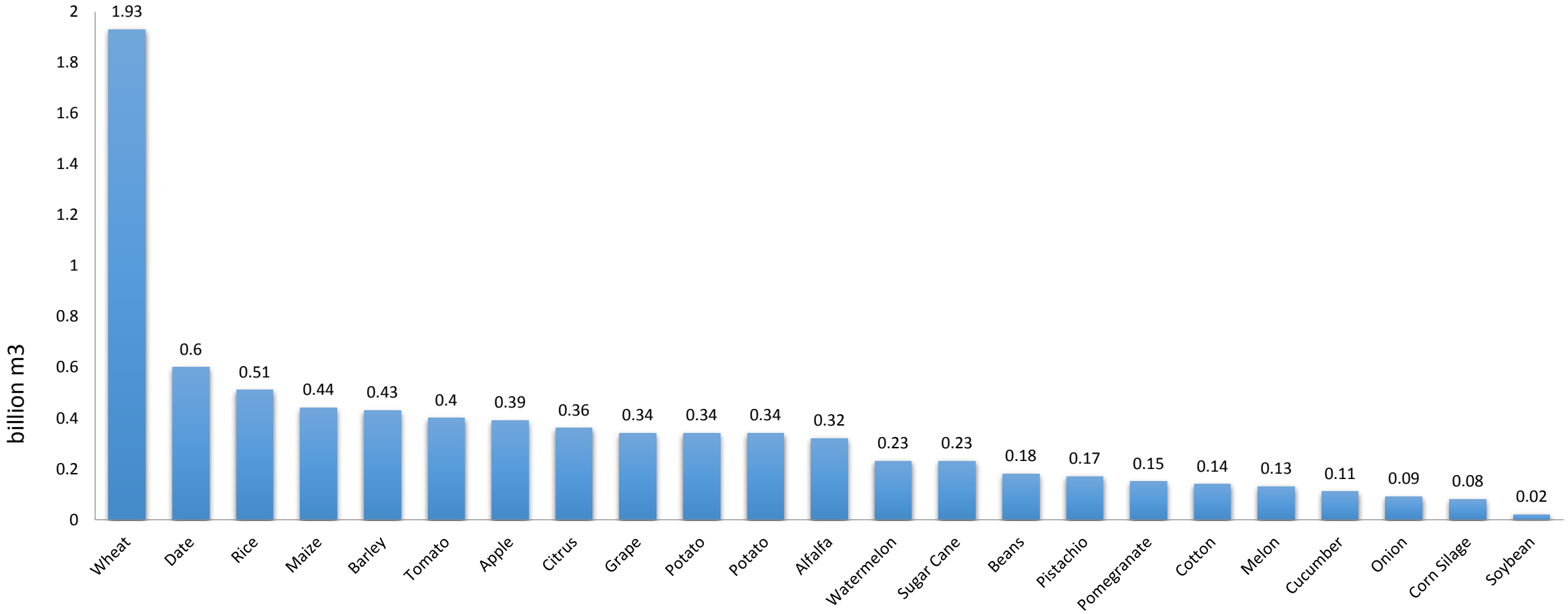
Iran diet


25.4
20.8
17.2
12.6
6.2
4.2
3.6
3.2
2.3
1.4
1.2
1.1
0.9
frouit
vegetables
wheat
milk
others
rice
sugar
white meat
oil
red meat
egg
sea food
beans

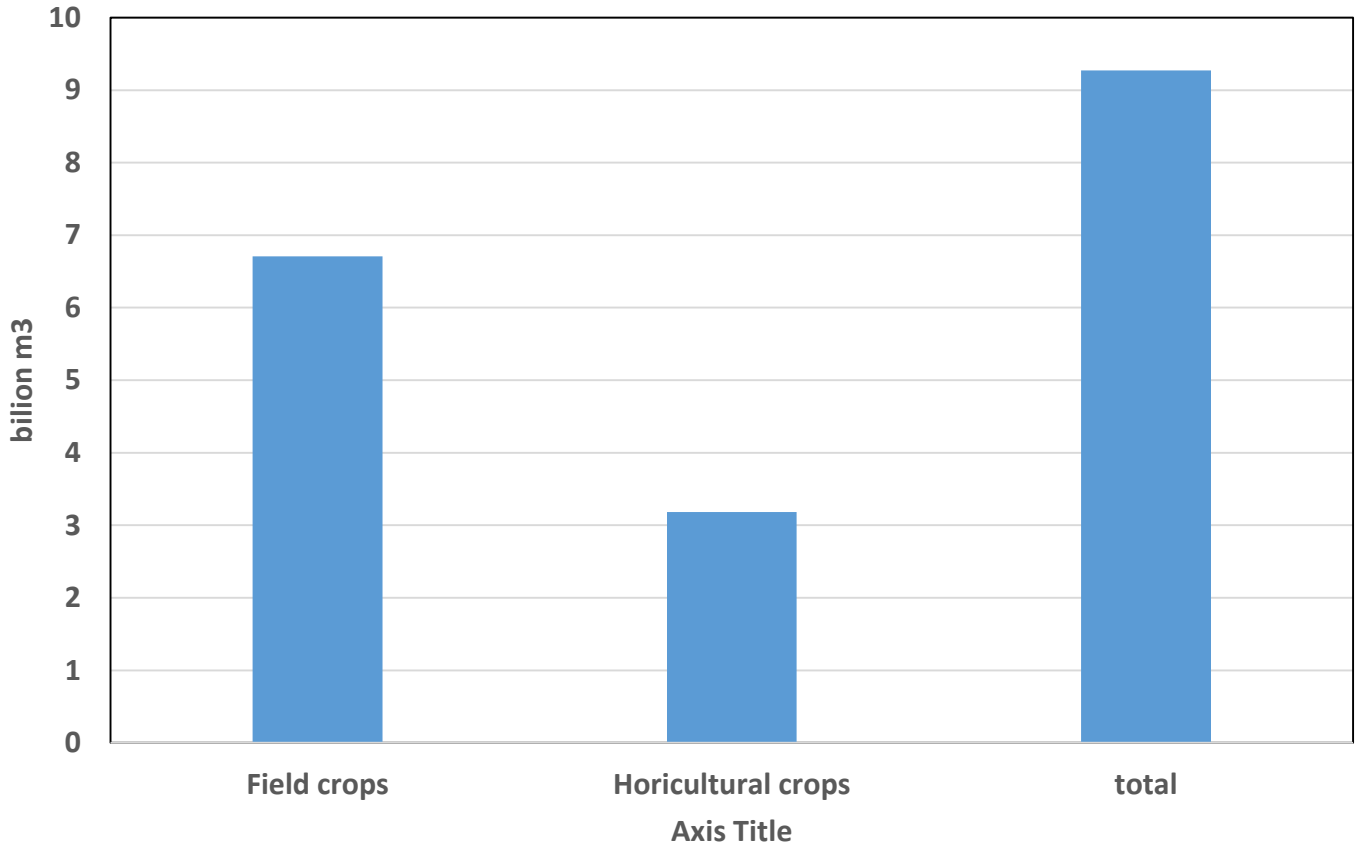
Estimated Losses for 23 Field & Horticultural Crops in Iran (2014)



Estimated Losses for Water in 23 Field & Horticultural Crops caused by losses in Iran (2014)



Estimated Losses for Water in Field & Horticultural Crops caused by losses in Iran (2014)



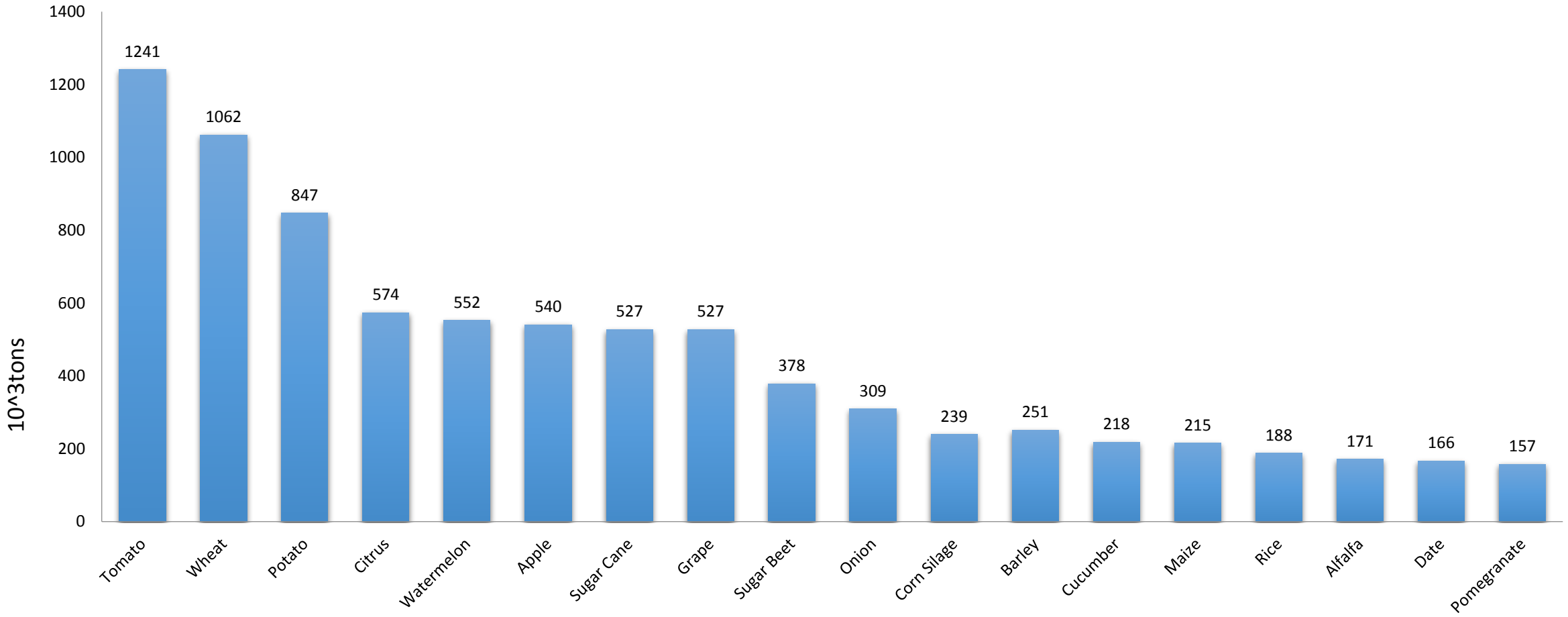
Impacts of Food Losses on Economy and Food Security

- Estimated economic losses caused by food losses in Iran: 100424 billion Rials = 3 billion Dollars

- This amount is equivalent to **24%** of the total imports of agricultural & food products from 2011-2014

- Estimated economic losses for water caused by food losses in Iran: 101268 billion Rials = 3.09 billion Dollars

Estimated Losses for 23 Field & Horticultural Crops



National Agriculture & Water Strategic Research Center

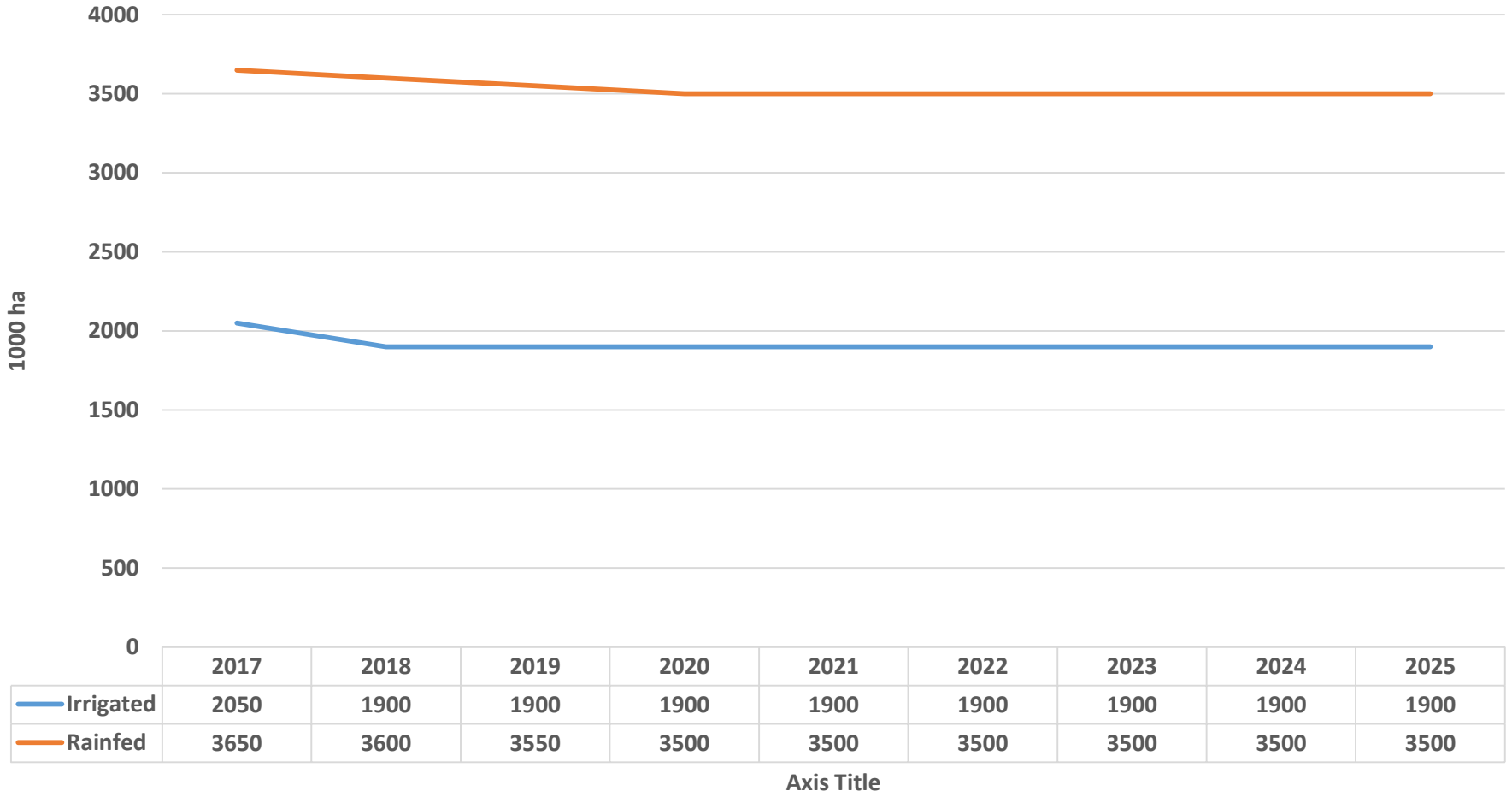
- Challenges to iran food security are: population growth, climate change, soil degradation by erosion, salinization, organic matter and nutrient depletion, and elemental imbalance, decreased availability of water, land competition for urbanization, brick making, and non-agricultural uses, and preferences toward animal-based diet.

Scenario for 2025

A-Policies :

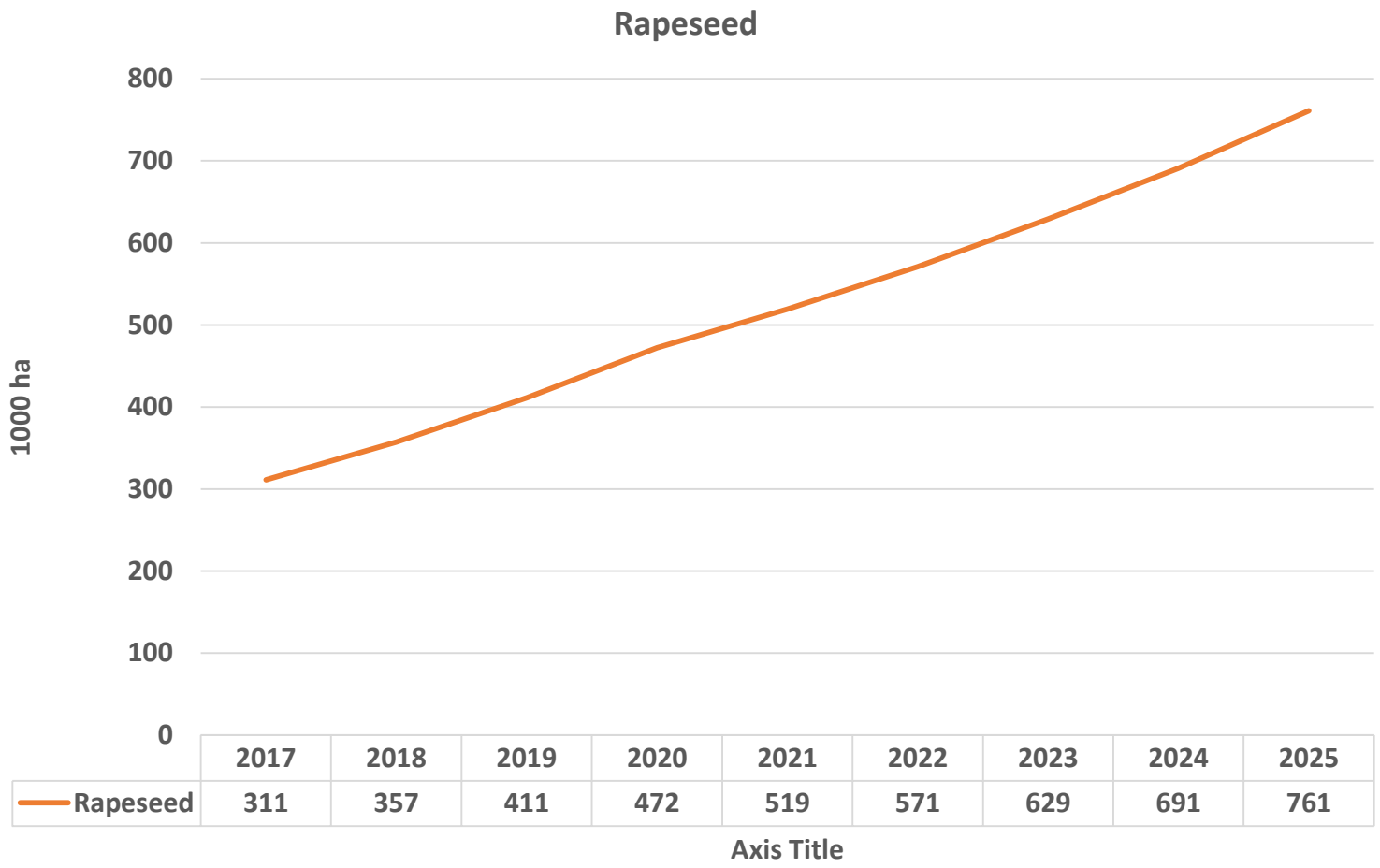
1. Strengthening food security (preserving at list 85% self sufficiency)
2. Decreasing the demand for blue water and focusing on green water
3. Increasing the water productivity and determining the bench mark for agri product
4. Agriculture sustainability (optimizing cultivation area)
5. Reducing wheat cultivation
6. Increasing oil seed particular rapeseed cultivation
7. Increasing fall sugar beet cultivation
8. Freezing sown area under cultivation

5-Reducing wheat cultivation

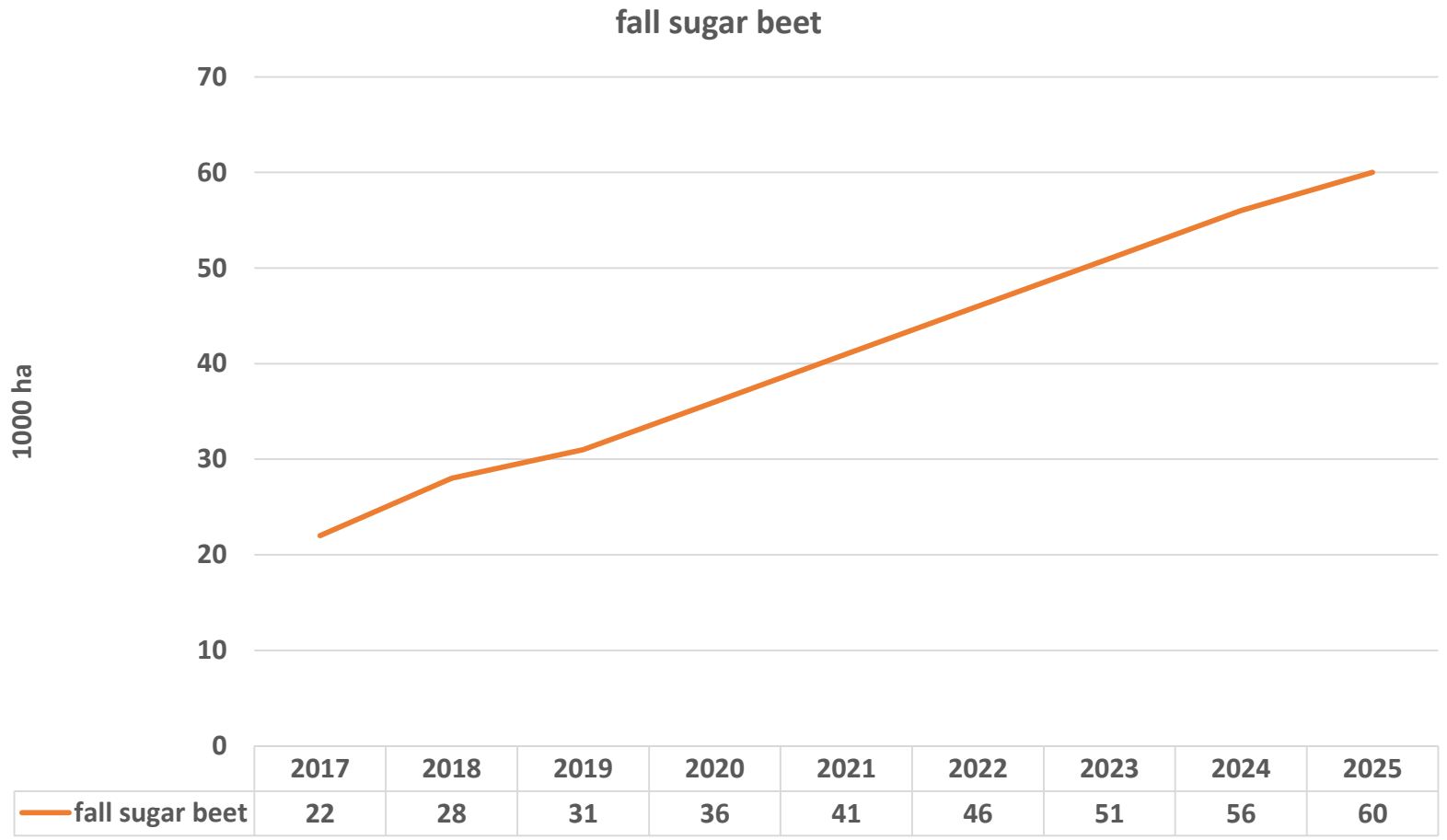


	2017	2018	2019	2020	2021	2022	2023	2024	2025
Irrigated	2050	1900	1900	1900	1900	1900	1900	1900	1900
Rainfed	3650	3600	3550	3500	3500	3500	3500	3500	3500

6-Increasing oil seed particular rapeseed cultivation



7-Increasing fall sugar beet cultivation



	2017	2018	2019	2020	2021	2022	2023	2024	2025
fall sugar beet	22	28	31	36	41	46	51	56	60

B:senarios

I.

- Implementation virtual water
- Supporting the rice cultivation only in Gilan and Mazandaran province
- Decreasing the spring sugar beet cultivation
- Introduction of low water demand fodder crops

II. Improvement agriculture :

- Increasing the water productivity
- Directing the production of vegetables to the controlled environment (Green house)
- Forecasting agricultural trade in the vision of 2025

2025		2020		
Self suffiency (%)	Import	Self suffiency (%)	Import	
100	0	99.5	75	wheat
63	1224	58.9	1340	Rice
100	0	88.7	479	barly
91	211	74	646	Sugar
52.8	781	33.3	1000	Oil
100	0	96.6	27	Beans
75.4	44	74.9	36	cotton
47.3	3674	39	4063	Maize
	5934		7666	Total