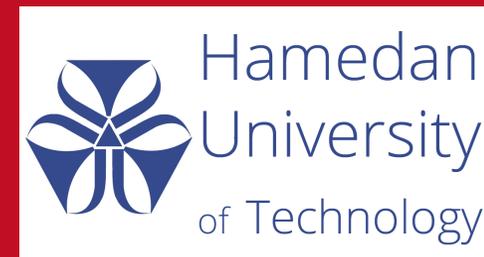


Update Case Study, IRAN

Application of AI in Targeted Subsidies Plan: **AI FORA high-level strategy**



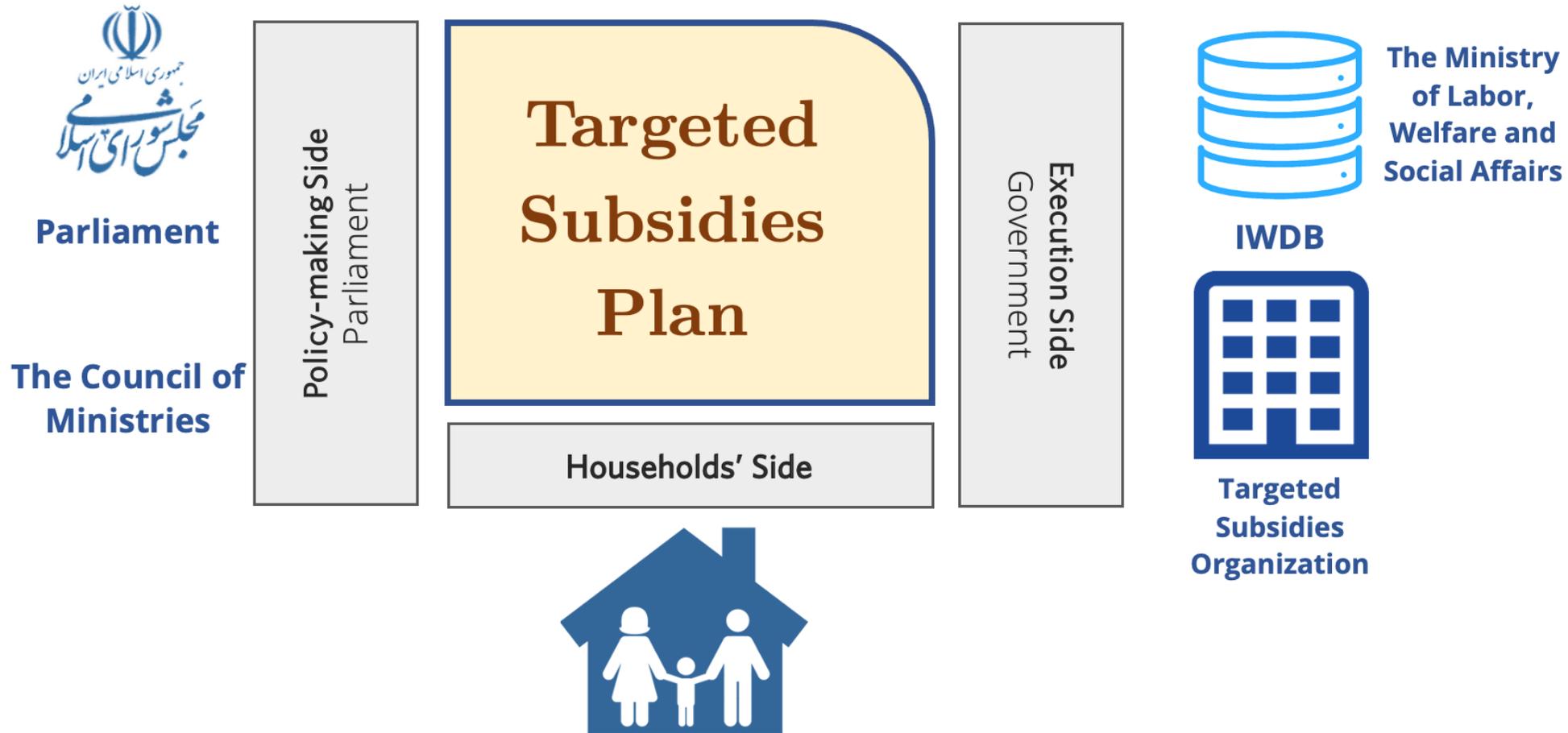
Hassan Bashiri,
Scientific Member, Hamedan University of Technology, IRAN

1. GENERAL UPDATE ON PROGRESS IN CASE STUDY

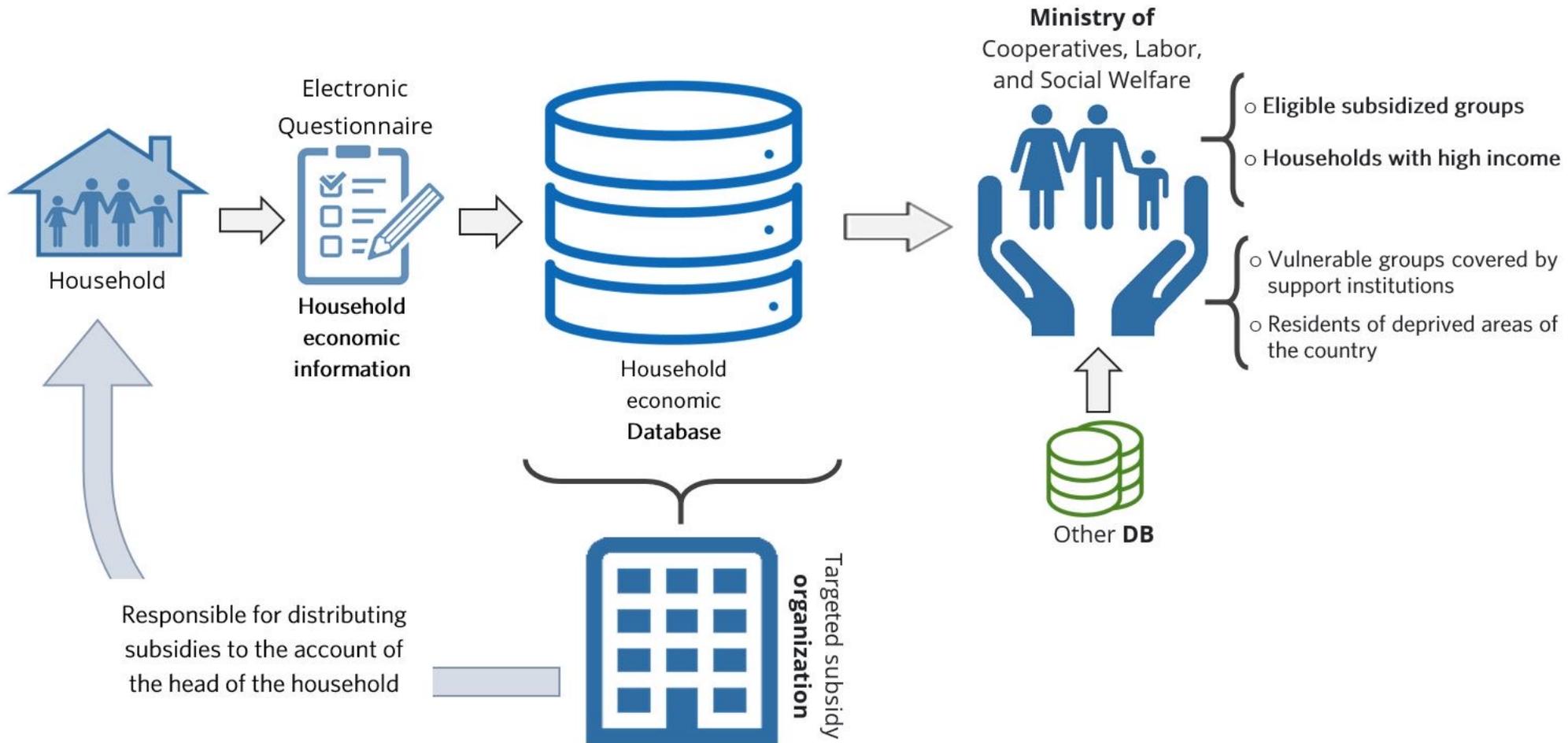
Research Steps in Past Year

- Interview with the Iranian Welfare Database team
- Analyzing two percent of the data in the Iranian Welfare Database
- Online questionnaire: the acceptance and trust level of artificial intelligence in the TPS.
- Providing the high level strategies based on analysis of stakeholders' opinion
- Designing the first version, an agent-based model in NetLogo and Python to simulate the targeted subsidies plan

2. ACTOR NETWORK MAP



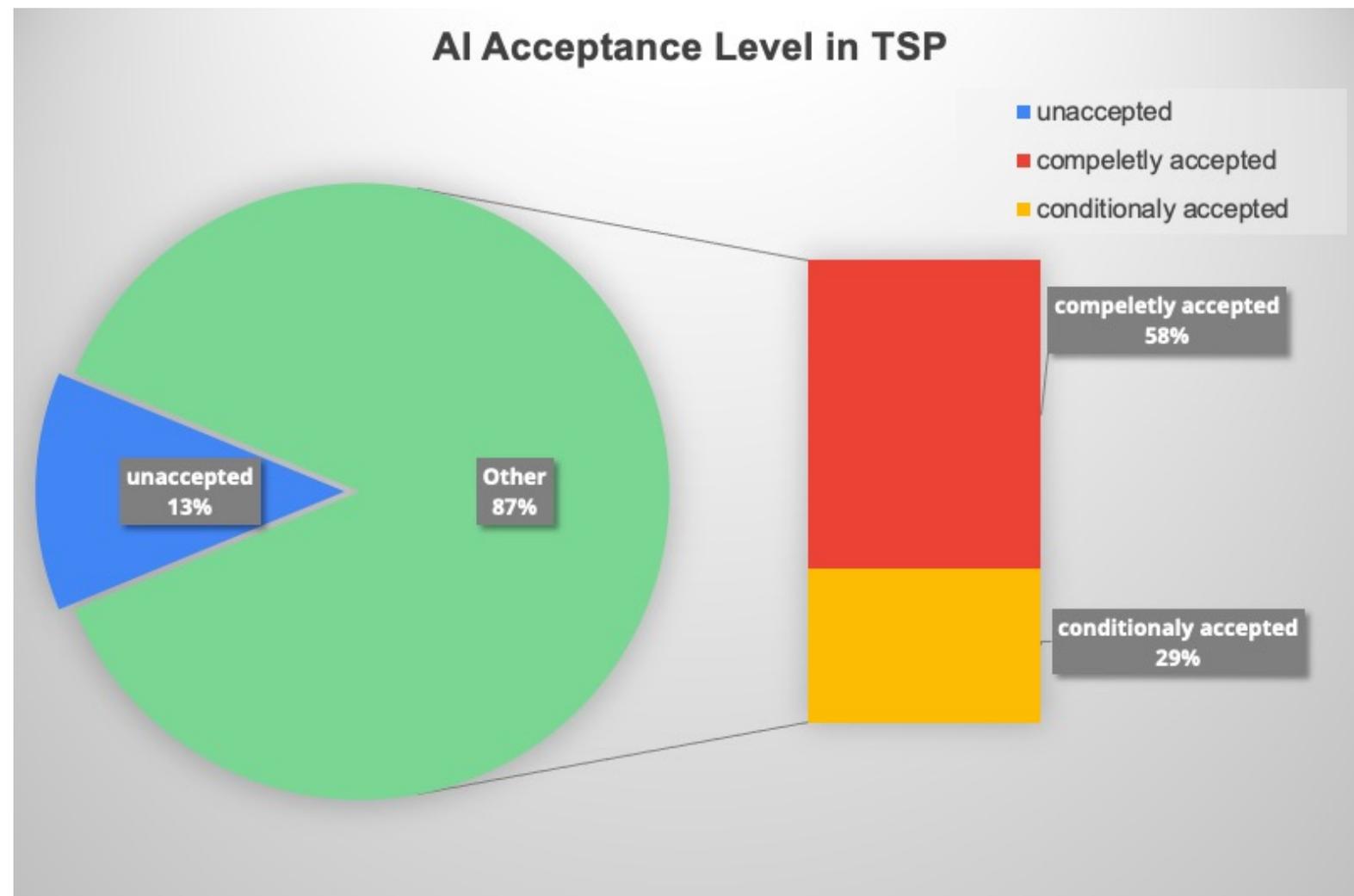
2. ACTOR NETWORK MAP (CONTINUE)



3. INSIGHTS FROM MULTI-STAKEHOLDER WORKSHOPS

AI Acceptance Level in the Targeted Subsidies Plan

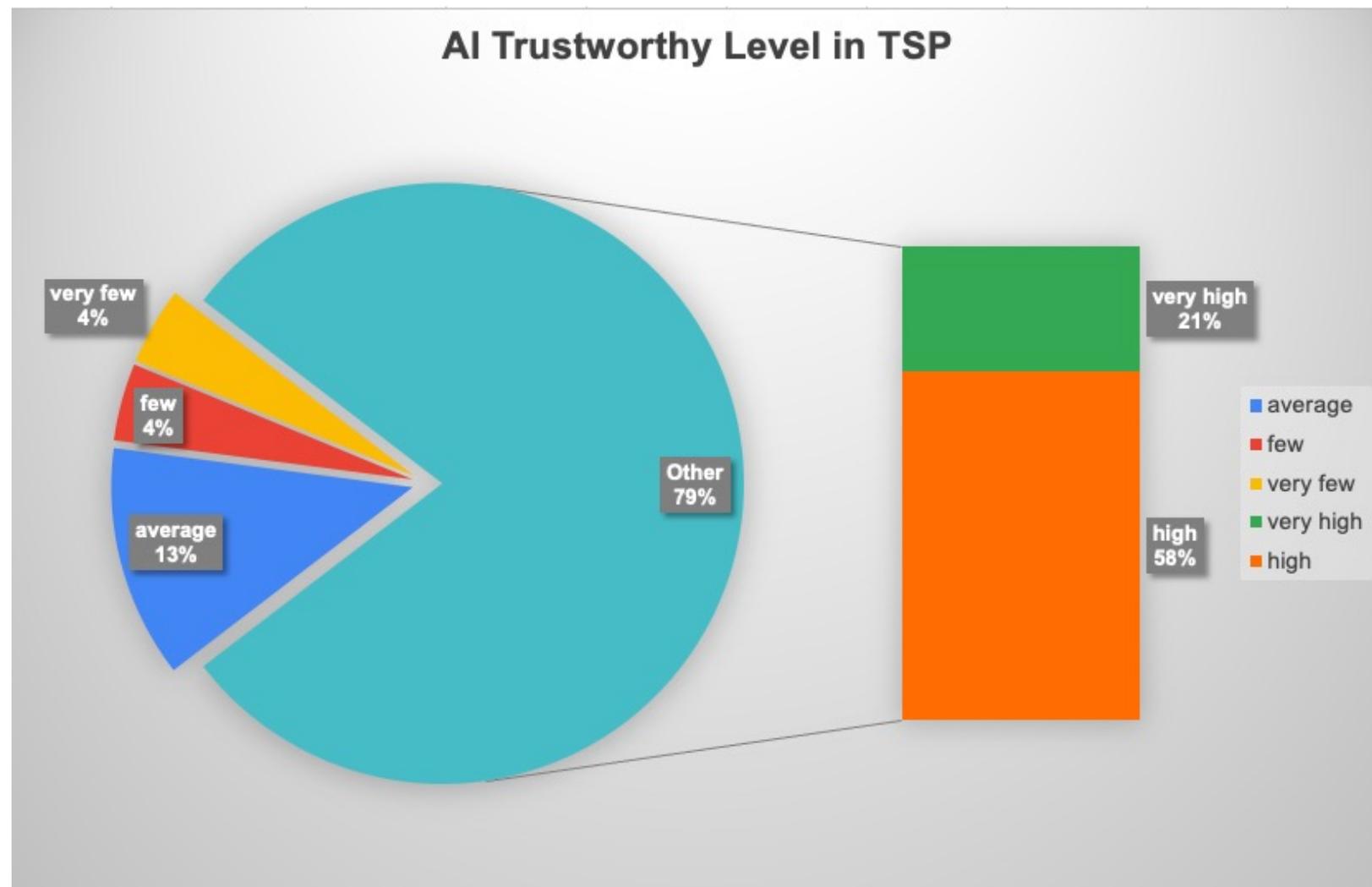
How acceptable is it to you that AI algorithms make decisions about household decimation by processing various data such as monthly salary, the number of your cars, the value of your asset, the number of foreign trips, etc.?



3. INSIGHTS FROM MULTI-STAKEHOLDER WORKSHOPS

AI Trustworthy Level in the Targeted Subsidies Plan

How much trust do you have in artificial intelligence algorithms regarding households' decimation in terms of the targeted subsidies plan?



3. INSIGHTS FROM MULTI-STAKEHOLDER WORKSHOPS

From existing to desired systems

○ **Household Side**

- Desirable situation: Fewer and more eligible households supported by the government.

removing more households with good economic conditions from receiving subsidies. Until now, due to political reasons, the removal of households from receiving subsidies has been done slowly.

transparency, explainability, and responsible AI for all households.

- Desirable situation: different amounts of subsidies for different groups.

Currently, grouping is done annually. The grouping can be done monthly if the system has access to online information. Technology and data integration are decisive in this matter.

3. INSIGHTS FROM MULTI-STAKEHOLDER WORKSHOPS (CONTINUE)

From existing to desired systems

○ Liberalization of Energy Prices

- Desirable situation: The price of energy is equal to the FOB of the Persian Gulf.

The price liberalization was done in only a few steps. But due to inflation and price increase due to political reasons, the price of energy carriers has not increased. This issue has caused the government to face a budget deficit every year.

Transparency of incomes from price liberalization and expenditures from the government side.

○ Macroeconomic Side

- Desirable situation: Managing macroeconomic changes in TPS.

Any macroeconomic changes directly affect the subsidy rate of the target groups, the price of energy carriers, and the number of households in each income decile.

3. INSIGHTS FROM MULTI-STAKEHOLDER WORKSHOPS (CONTINUE)

From existing to desired systems

○ Technology Side

- Desirable situation: Deploying IWDB in Central Bank.

Setting up the national network and infrastructure is necessary for the early collection of **data and the maximum participation** of organizations in sending data.

Refine the data before using it for decision-making. Although the households' eligibility models work properly, **the model** needs to be strengthened.

It is desirable to strengthen **data-driven decision-making methods** in order to identify tax evasion or methods used by households to hide their income and wealth.

4. MAIN INTERIM RESULTS

- "Iranian Welfare Database" is currently the most important asset of the targeted subsidies plan.
- The role of AI in TPS is **undeniable** and **inseparable**. AI as an embedded technology in the TPS.
- The level of acceptance and trust of AI in solving social provisions depends on the problem that is going to be solved. AI for solving public problems or for solving government domination problems, that is the question.
- Technology is not enough to solve complex problems: Economic-political challenges have strongly influenced the success of the TPS.
 - According to the information published by the Iranian Statistics Center, in the March of 2018, the inflation difference between the first and tenth deciles was zero, but in Feb 2023, the inflation for the tenth decile was 45%, and for the first decile was 55%.

5. CHALLENGES DURING RESEARCH: ETHICAL ISSUES AND SURPRISES

Surprise:

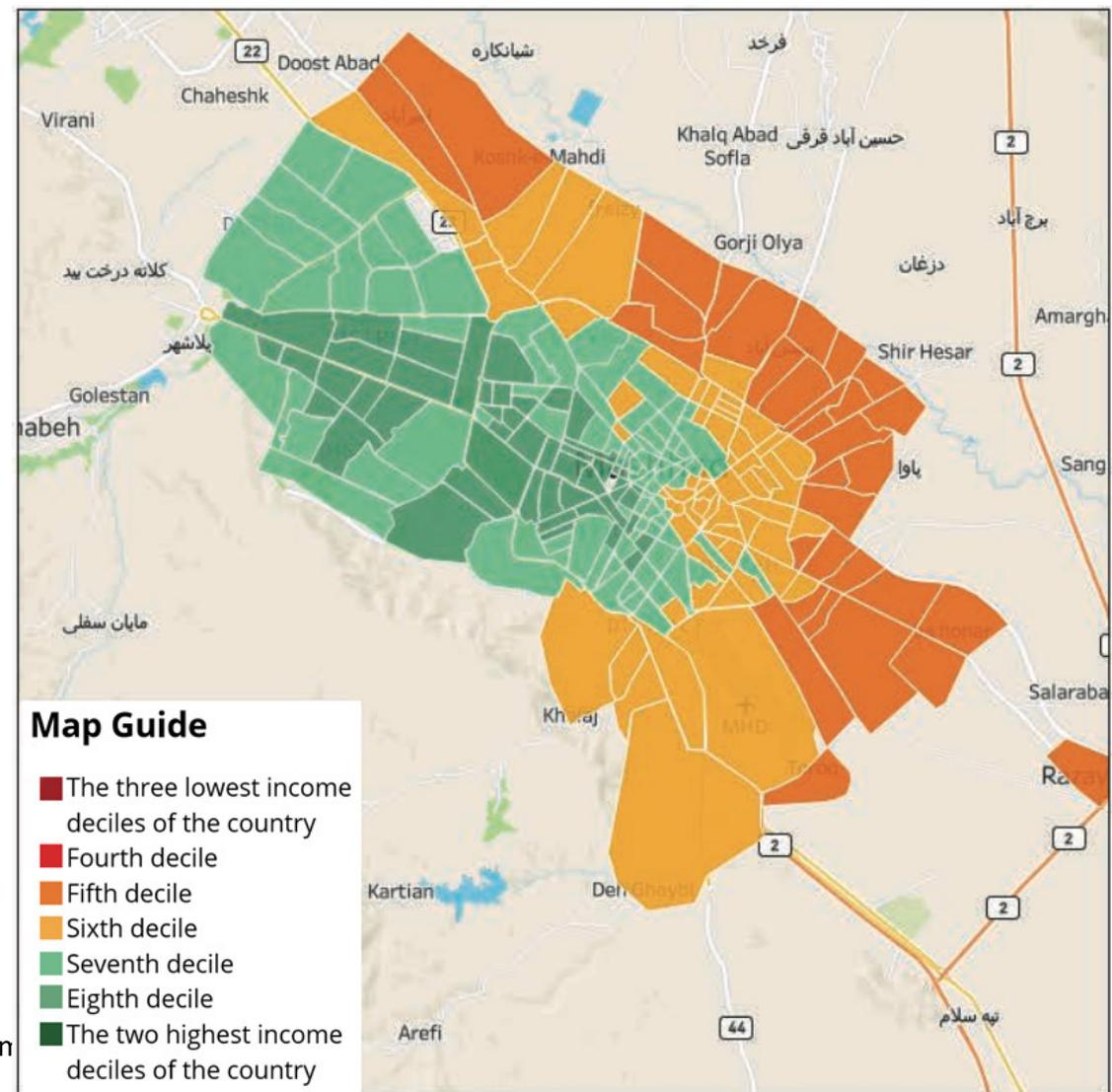
Different perspective to AI for Assessment in Germany and IRAN.

Note 1 of Article 3 of the regulation of TPS approved by Council of Ministers on 2019.

“The average situation of the last three years of financial indicators or the average withdrawal of the six months leading up to the time of determining the eligibility is the basis for identifying the income level and scoring the household. Determining the eligibility of households for subsistence support and other support items based on the model(s) approved by the Ministry of Labor, Cooperation, and Social Welfare **is done automatically by AI and machines without any human intervention in the results. Viewing and checking bank information is prohibited by persons and officials.**”

6. NEXT STEPS TOWARDS HIGH-LEVEL STRATEGY

- depicting the distribution of poverty, prosperity, and inequality in cities.
- In the welfare map of the country
 - 100 cities,
 - 24 indicators of poverty and social welfare for each province and city,
 - compared with the average of the country or other regions.



TARGETED SUBSIDIES PLAN

Agent-Based Modeling Approach

ABM FOR THE TARGETED SUBSIDIES PLAN

- 230 households (a scale of 23 million households in the country)
- Family size is randomly based on normal distribution based on real data
- Each household receives income and wealth randomly
 - both according to a power-law distribution (based on real data)
 - households are divided into ten groups (based on income and wealth)
 - In the simulation process, about 2% of households will be bankrupted and about 2% of households will be richer. At the end of each year, the grouping will be recalculated.
 - To show the dynamics of the Targeted Subsidies Plan

normal speed view updates
 ticks: 4351 continuous

AI-FORA Research Project

num-of-households 230

subsidy-group-1 200

subsidy-group-2 150

subsidy-group-3 100

subsidy-group-4 50

Every year, some households lose their wealth and some become suddenly rich. Using these two variables, determine the rate of bankrupt households and wealthy households.

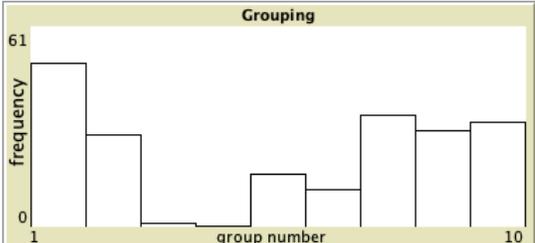
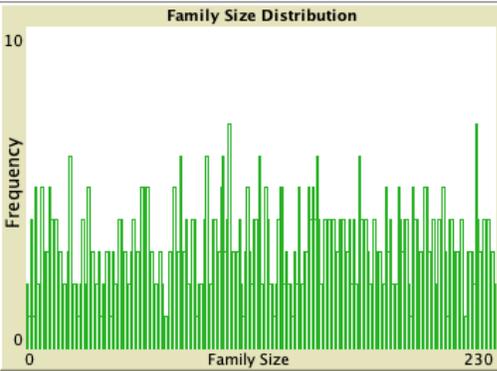
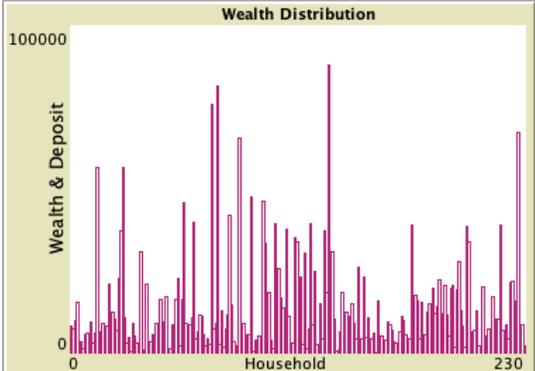
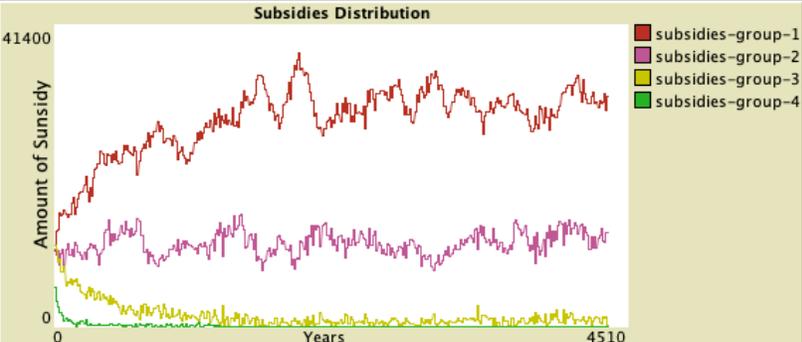
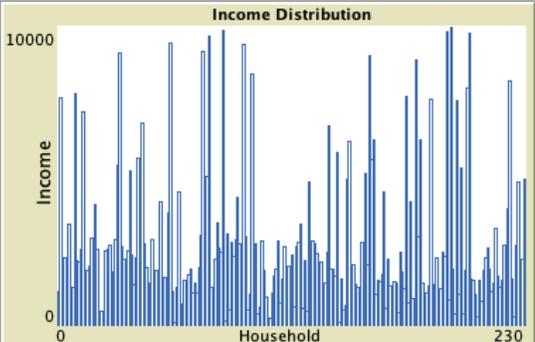
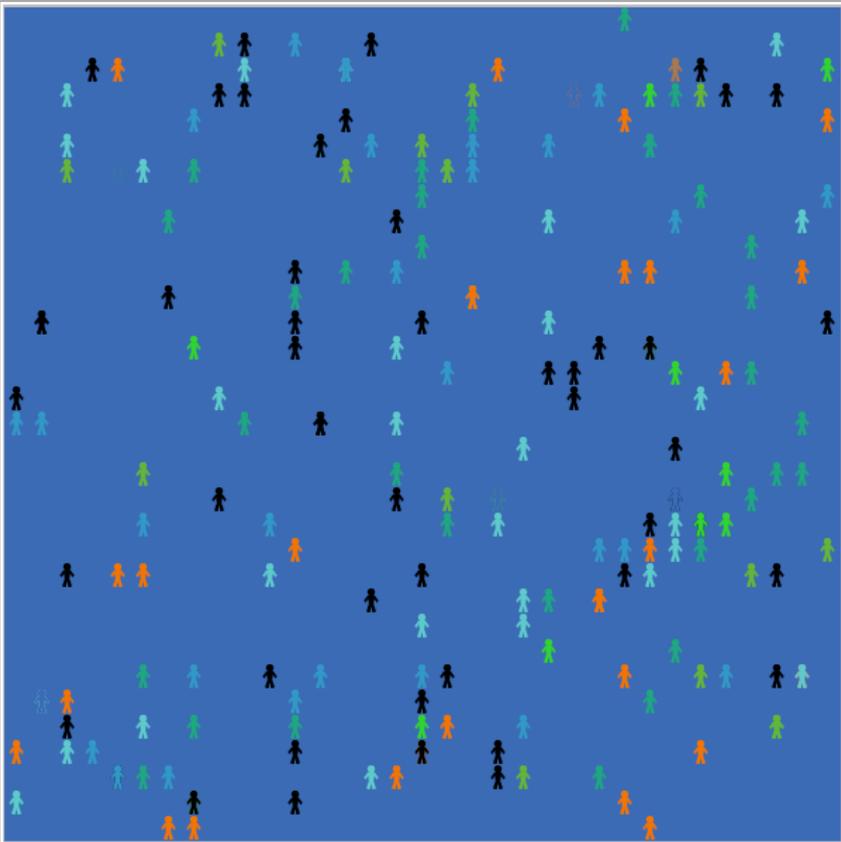
enrichment-rate 2

bankruptcy-rate 1

Setup Society

go

- Color Guide
- black: decile 1
 - red: decile 2
 - orange: decile 3
 - brown: decile 4
 - yellow: decile 5
 - green: decile 6
 - lime: decile 7
 - turquoise: decile 8
 - cyan: decile 9
 - sky: decile 10



Comments and Questions

