Perceived challenges and recommendations for reduction of pesticide use: A participatory mapping exercise with stakeholders in Cyprus

Preventing Pesticide Effects on Children's Health and Protecting the Environment

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In collaboration with the Department of Agriculture

Health effects of Pesticide Exposure

Outcome	Main affected groups	Exposure contexts & key findings	Key Literature (reviews)
Cancer	• Farmers & pesticide applicators • Greenspace workers (e.g. gardeners, golf course) • Children (prenatal & early-life exposure)	• Lung, prostate, colorectal cancer and multiple myeloma • Leukemia, soft tissue sarcoma and non-Hodgkin lymphoma • Parental occupational and prenatal exposure linked to brain tumours and other cancers in children	• Varghese, JV et al. *Reviews on Environmental Health* (2021) • de Graaf L et al. *Environmental Research* (2022) • Maele-Fabry GV. *Environment International* (2013)
Respiratory diseases	• Children and Adults in agricultural settings • Children exposed via proximity, take-home exposure from parents, diet & household use	• Development or exacerbation of asthma • Acute respiratory symptoms and impaired lung function	• Ki-Hyun K, et al. Science of the total environment (2017) • Van Horne YO et al Science of the total environment (2022)
Neurological disorders	• Occupationally exposed adults • Children (prenatal exposure)	• Parkinson's disease, Alzheimer's disease and Amyotrophic Lateral Sclerosis (ALS) • Lower IQ and impaired working memory in children	• Kaur K & Kaur R. *Indian journal of occupational and environmental medicine* (2018) • Ki-Hyun K et al. *Science of The Total Environment* (2017)
Mental, endocrine, reproductive & cardiovascular	• Agricultural workers • Occupationally exposed populations	• Depression among agricultural workers • Increased risk of hypothyroidism • Myocardial infarction and hypertension • Adverse effects on male fertility	• Cancino J, et al. *Environ Res* (2023) • Sirikul W & Sapbamrer R. *BMC Public Health* (2023) • Zago A et al *Global Public Health* (2020) • Giulioni C et al *Andrology (2022)*

From health evidence to policy … to practice

Target: 50% reduction in chemical pesticide uses **by 2030**, with emphasis on more hazardous products.

- Policies have triggered reactions among farmers in several EU countries reflecting concerns about alignment between **policy ambitions and on-the-ground realities**.

- Achieving targets depend on **how pesticide use is shaped**
  - **in everyday farming practices** and
  - in specific **socio-cultural and socio-political contexts**?

Perceptions and Practices of Farmers?

- **Greece: Willingness to use lower-risk pesticides** *Damalas CA, et al Envir Challenges (2024)*
  - Survey, **148 farmers: 24%** reported preference for lower-risk products
  - **+ve associated:** younger age, education, prior training, risk perception, use intensity
- Many studies with farmers focus on:
  - **Knowledge** of risks & **risk perception** *(consequences)*
  - **Skills** & **Procedural knowledge** of pesticide use/ IPM
  - **Attitudes** & **Beliefs** toward health and environmental harm
- Familiar conclusion: *"Farmers need more training / awareness / education."*
- With some exceptions, studies **often missing:**
  - **Theory-driven** understanding of **behaviour**
  - **Wider system** around the farmer that shapes current practices.

Bakker et al. (2021, Netherlands); Kaiser et al. (2024, Switzerland)

Behaviour: COM-B model (Centre for Behaviour Change – UCL)

Be able and know how! **Capability**

Conditions and context allow/ promote it! **Opportunity**

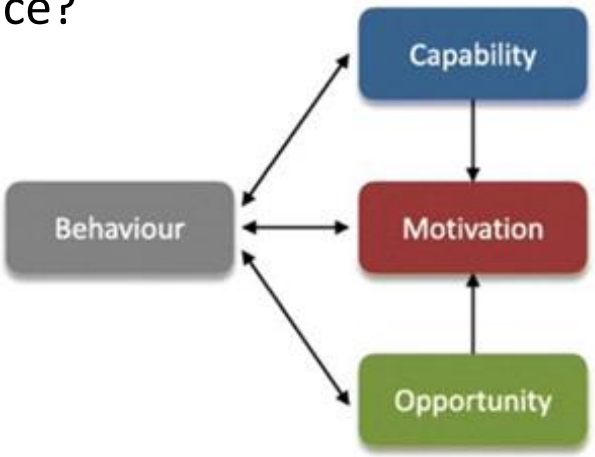
Want to! **Motivation**

Physical opportunity

- Access to safer alternatives?
- Equipment quality and maintenance?
- Training opportunities and Guidance?

Social opportunity

- Peer norms & other Influences?
- Behaviors of end-users?
- Trust (or mistrust) in authorities?



Structural / Institutional Context

- Regulatory context & Enforcement practices?
- Market and other pressures (price, yield expectations)?
- Incentives or disincentives in subsidy schemes?

Cross-sectoral Workshop

ΚΥΠΡΙΑΚΗ ΕΤΑΙΡΕΙΑ ΕΠΙΔΗΜΙΟΛΟΓΙΑΣ ΚΑΙ ΔΗΜΟΣΙΑΣ ΥΓΕΙΑΣ
ΣΕ ΣΥΝΕΡΓΑΣΙΑ ΜΕ
ΥΠΟΥΡΓΕΙΟ ΓΕΩΡΓΙΑΣ, ΑΓΡΟΤΙΚΗΣ ΑΝΑΠΤΥΞΗΣ ΚΑΙ ΠΕΡΙΒΑΛΛΟΝΤΟΣ,
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ΟΡΘΟΛΟΓΙΚΗ ΧΡΗΣΗ ΦΥΤΟΠΡΟΣΤΑΤΕΥΤΙΚΩΝ ΠΡΟΪΟΝΤΩΝ

Λευκωσία 8 Φεβρουαρίου, 2024

- ❑ Structured in **two parts**:
- Invited presentations from relevant authorities-academics
- **Facilitated participatory session** to capture participants' perspectives

- What do farmers and stakeholders in Cyprus perceive as
  - main **barriers or challenges** to pesticide use reduction, and
  - which **enabling conditions** could facilitate safe and more sustainable use?

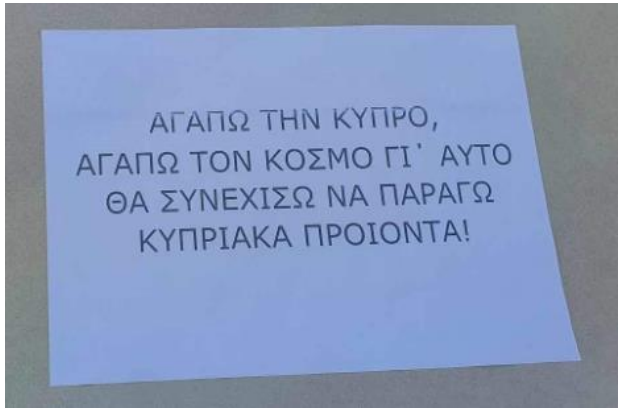
36 participants representing **12 organisations/ several sub-divisions**,

- competent authorities – *Agriculture (10), Environment (1), General Laboratory (1), Public Health Services (2), Occupational Health (1), Institute of Agricultural Studies (10),* academics-researchers *(8)* and farmers' unions *(3)*

Γιατί βγαίνουν στους δρόμους οι αγρότες και στην Κύπρο; – Οι «πράσινες» πολιτικές και η «κραυγή» για οικονομική βιωσιμότητα

08.02.2024

Οι **Κύπριοι αγρότες κρούουν τον κώδωνα του κινδύνου, υποστηρίζοντας ότι η Κύπρος δεν μπορεί να εφαρμόσει τα μέτρα που προσδοκεί η Ευρωπαϊκή Ένωση,** στο πλαίσιο της πράσινης μετάβασης, προειδοποιώντας ότι αν αυτές οι αποφάσεις υλοποιηθούν στην Κύπρο, ο πρωτογενής τομέας θα οδηγηθεί στην κατάρρευση.



Σημειώνουν ακόμη ότι έ**χει αυξηθεί σημαντικά και το κόστος καλλιέργειας, πράγμα που επηρεάζει και τους καταναλωτές,** ενώ θέτουν επί τάπητος και **τις ιδιαιτερότητες του νησιού μας,** όπως οι κλιματολογικές συνθήκες και η ελάχιστη καλλιεργήσιμη γη.

Phase 1: Stakeholder workshop

Modified two-stage Nominal Group Technique (NGT)

- Participants were presented with guiding question:

"Based on your knowledge and experience, what are the barriers and challenges (real or perceived) to the implementation of pesticide-reduction measures?"

- Process included:
  - Silent generation of ideas *(up to 10 per participant)*
  - Round-robin sharing to ensure active participation by all
  - Group discussion, clarification, and consensus-based grouping

- Inputs **mapped live and classified according to the COM-B model**,
  - promote shared understanding of complex inter-play of factors

Capability	Opportunity	Motivation
• Knowledge of **non-chemical / alternative pest control** methods and technologies (3)	• **Health records/ epidemiological studies** and monitoring of health indicators (2)	• Perceptions of **health impacts** (own and their families) from long-term exposure (1)
• Non-targeted education/ training **not aligned with farmers' real needs** (5)	• Practical **training programmes** for tangible skills in rational use PPP (4)	• Prescription and **monitoring system** for pesticide use (10)
• Exclusion of **migrant workers** from training programmes (6)	• Lack of **inspection and control mechanisms for migrant workers** (7)	• Lack of studies on **consumer attitudes** towards the **safety** of agricultural products (20)
• Knowledge and skills in conducting **economic assessments, farm management and planning** (8)	• **Availability, suitability and targeting** of alternative methods and technologies (11)	• Lack of studies on consumer preferences for organic products **in relation to cost** (21)
• Capacity and relevant knowledge for **maintaining pesticide use records** (9)	• **Production costs** and comparative costs when using alternative methods (12)	• Promotion of **Cypriot products** and mechanisms for distribution of traditional seed varieties (22)
• **Knowledge of costs and effectiveness** of alternative methods in **local agriculture** (14)	• Cost of **equipment and consumables** (13)	• **Labelling schemes** for plant protection practices on domestic and imported products (24)
• Limited procedural capacity to adapt rational use practices to the **Cypriot context** (15)	• Targeted advisory mechanism and **problem-solving support systems** (16)	• Scoring schemes, lack of **financial incentives** and ineffective subsidy mechanisms (26)
• Existing knowledge and skills of officers and **lack of specialisation** in non-chemical alternatives (17)	• Conflicts of interest & **regulatory framework** for agronomist profession (19)	• Insufficient promotion of **good practices** and lack of **rewards** or other incentives(27)
• Insufficient **number** and inadequate **training** of public- and private-sector advisors (18)	• Regulatory framework for **price-setting/ control systems** (23)	• Absence of comprehensive long-term agricultural policy and a **shared strategic vision** (29)
	• Inadequate control of **imported products**, from **occupied areas** and competitive pressures (25)	• Social recognition & sustainability of **farming profession**, and incentives for new entrants (30)
	• Conflicting policies between competent authorities- **non cross-sectorality** (28)	• **Participatory consultation processes** for co-design of national plan with farmers (31)
	• **Lack of trust** in competent authorities and European institutions (32)	

Phase 2: Post-workshop synthesis and survey

Development of **structured questionnaire** ***(51 items)***

- covering all identified barriers and facilitators,
- after further refinement and grouping

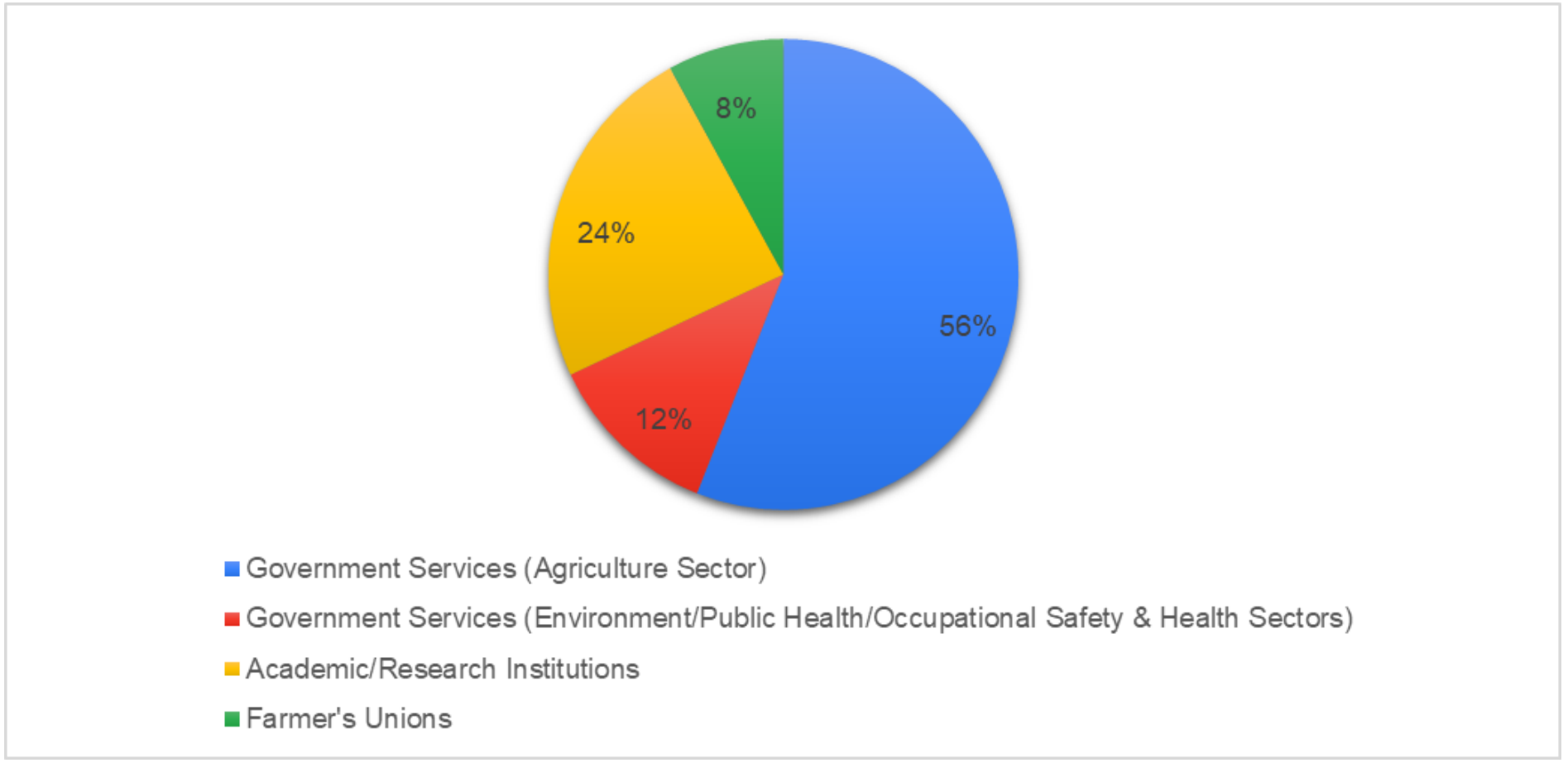
- Distributed to all workshop participants online

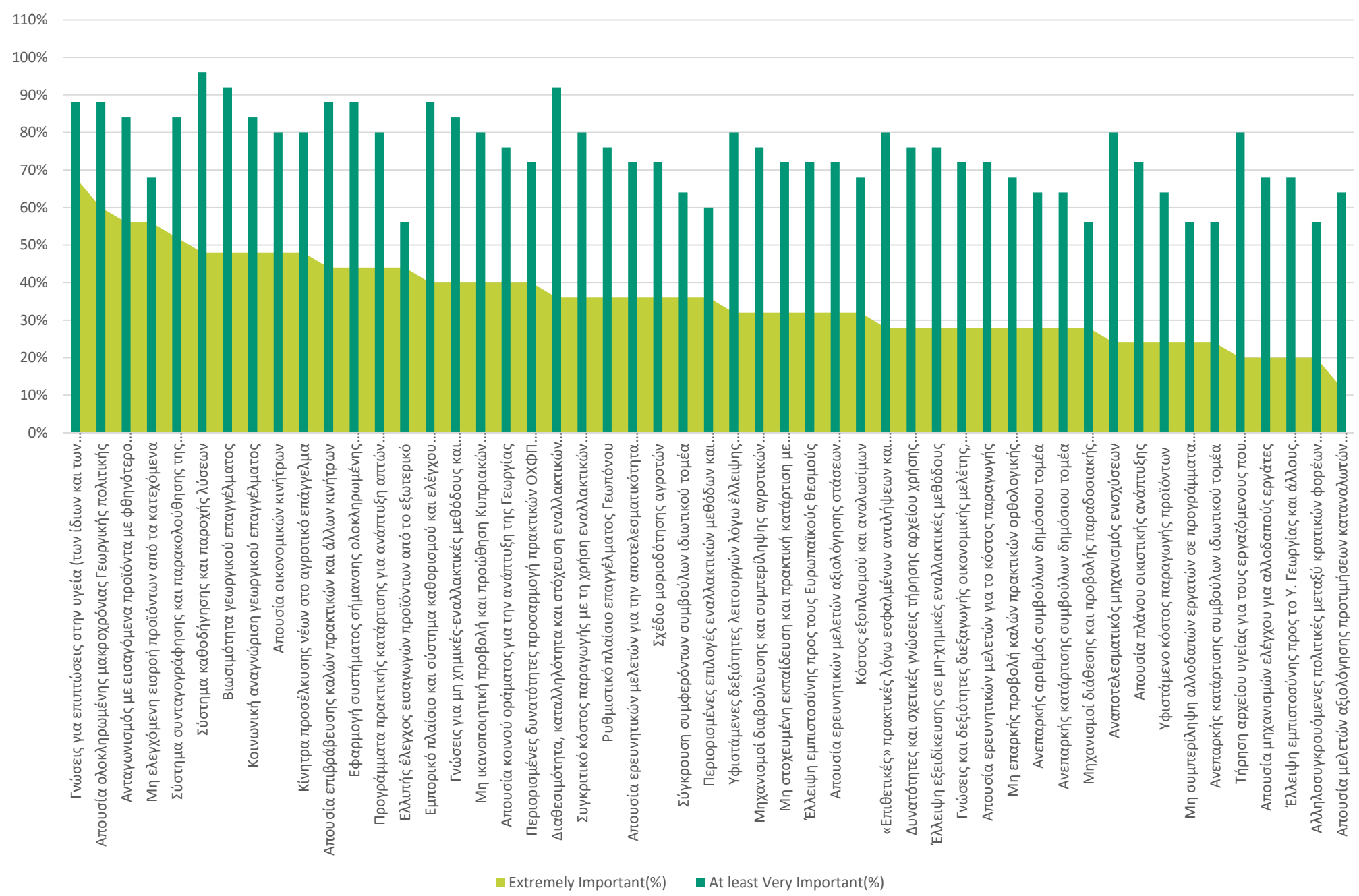
- Participants were asked to:
  - **A. Rate the importance** of each item
    on a **4-point scale** *(1 = not very important to 4 = extremely important)*

  - **B. Select 5 most critical factors**
    where action would, *in their view*, have **highest likelihood of success**

Survey Responses

- 25 responses (69% response rate)





All responses:

- % at least *"very important"*
- ranked by *"extremely important"*

A. Factors *(barriers or challenges)* that influence current practices in the use of PPP by farmers in Cyprus

➢ **Top 5 based on *'Extremely Important' → 'At least very Important'***

1. **Knowledge/ Perception of health impacts** (on themselves and their families) from long-term exposure to pesticides — 68% → 88%
2. Lack of a **comprehensive long-term** agricultural **policy** — 60% → 88%
3. Competition from **imported products** with lower costs — 56% → 84%
   Uncontrolled inflow from **areas not controlled by RC** — 56% → 68%
4. **Prescription** and **monitoring system** for pesticide use — 52% → 84%
5. Guidance and **problem-solving support mechanism** — 48% → 96%

Closely followed also at 48% extremely important by:

Lack of financial incentives, social recognition, sustainability of **farming profession** & incentives for new entrants to the profession

A. Factors *(barriers or challenges)* that influence current practices in the use of PPP by farmers in Cyprus

➢ ***Lowest 5 based on 'Extremely Important' → 'At least very Important'***

1. Lack of studies on **consumer preferences** for organic products in relation to cost 12% → 64%
2. Maintaining **health records for workers** exposed to pesticides and monitoring health indicators 20% → 80%
3. Lack of monitoring mechanisms for **foreign workers** 20% → 68%
4. **Lack of trust** in the MoA and other competent **authorities** regarding their intentions 20% → 68%
5. **Conflicting policies** between government bodies and services 20% → 56%

B. Five most critical factors

*…which if addressed through appropriate measures, would have the **greatest comparative likelihood of success** in promoting the correct use of plant protection products*

1. **Knowledge of health impacts** (on themselves and their families) from long-term exposure to pesticides (48%)
2. **Knowledge of non-chemical, alternative** methods and technologies for controlling insect pests (40%)
3. **Uncontrolled inflow** of products from **areasnot controlled by Republic of Cyprus** (32%)
4. Guidance and problem-solving **support mechanism** (28%)
5. Non-targeted **training and hands-on capacity building** based on farmers' real **needs** (24%) & Current product production **costs** (24%)

Conclusions

- **Top-ranked priorities**:
  - emphasis on **knowledge** *(health effects/options and procedural skills)*
  - at the same time, **key system-level constraints** also emerged
- Taken together, findings suggest that calls for **"more training"** do not reflect denial of systemic problems, but rather:
  - a **perceived absence of trustworthy, tailored and practically useful support**, &
  - limited visibility of **feasible alternatives within current economic-regulatory conditions**
- **Climate of mistrust** *(national and EU authorities),* itself acts as a **barrier to cooperation, further undermining motivation**
  - Participatory approaches are not a methodological choice, but a governance necessity
  - Engaging stakeholders enhances transparency and legitimacy and is more likely to surface system-level constraints and challenges

Next Steps (as Results from the Workshop)

- **Explore more in depth the unmet needs** of the farming workers, since farmers were underrepresented in the workshop

- **Co-design** an implementation package (not training alone)

- **Align with policy** and market conditions

Next Steps (in Progress, CyEPHA)

- Funding is being pursued (a research proposal has been submitted) to support the next phase
- Goals
  - ✓ **Assess the knowledge, practices, and behaviours of pesticides users** related to pesticide use
  - ✓ Develop, implement, and evaluate a **setting-specific, theory-based educational intervention**
  - ✓ **Assess internal exposure** a potential motivator
  - ✓ Design the **intervention for easy adoption** and scale-up by relevant authorities and farmer organizations

Thank you!

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