CENTRE D'ETUDE SUR L'EVALUATION
DE LA PROTECTION DANS LE DOMAINE NUCLEAIRE

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REHABILITATION OF LIVING CONDITIONS IN CONTAMINATED TERRITORIES: THE ETHOS APPROACH

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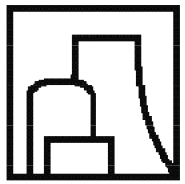

INTRODUCTION (1)

Living conditions in contaminated territories after an accident are characterised by:

→ Disturbances of all aspects of living conditions
Quality of the day-to-day life is affected

→ Impossibility to continue the normal way of life
General feeling among the affected population of insecurity and loss of control

As a consequence, rehabilitation programmes need to consider not only radiological protection but also psychological, social, economic, political and ethical dimensions

INTRODUCTION (2)

Two interrelated and complementary approaches have to be considered for the implementation of rehabilitation programmes:

→ The centralised actions of Public Authorities
Regulatory framework, principles and criteria, evaluation of the radiological situation, intervention strategies, national resources allocation, international co-operation…

→ **The direct involvement of the affected populations at the local level**

INTRODUCTION (3)

Contents of the presentation

- The ETHOS Project
- Elements for structuring the involvement process of local stakeholders

  Illustrated with the ETHOS experience
- Concluding remarks

THE OBJECTIVES OF THE ETHOS PROJECT

To develop a sustainable rehabilitation of living conditions:

→ Addressing jointly technical and societal dimensions

Main focus on the improvement of the day-to-day quality of life

→ Involving actively all local, regional and national stakeholders in a decentralised approach

IMPLEMENTATION OF THE PROJECT

- In the village of Olmany (**1300** inhabitants) in the district of Stolyn in Belarus, during **3** years (**1996-1998**)
- An interdisciplinary team of **12** members
- Co-operation agreement with the Ministry of Chernobyl and the district and village authorities
- Twelve missions - more than **100** days of presence in the village
- Working groups involving about **100** inhabitants and dealing with specific aspects of private and social life

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^{137}CS DEPOSITION MAP OF THE DISTRICT OF STOLYN

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THE SIX WORKING GROUPS

- The radiological protection of children by the mothers
- The management of the radiological quality of the milk production by private farmers
- The management of the radiological quality of the meat production by private farmers
- The education of children living in a contaminated environment by the teachers
- The management of contaminated waste by the villagers
- The shooting of a video film by the teenagers

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MAIN RESULTS

- The population is now living with a more precise and reliable picture of the radiological situation
- The production of milk below the limit has increased from **25** to **55%** in winter and from **10** to **80%** in summer
- The internal contamination of children has been reduced by about **30%**
- Economical circuits with the non-contaminated zones have been restored for milk and meat
- Inhabitants have recovered self confidence and initiative
- Public confidence and social trust are significantly restored

THE STAKEHOLDER INVOLVEMENT PROCESS

1. Development of respectful relationships with the affected populations and the relevant stakeholders

- Finding out stakeholders' issues and concerns

  Listening to concerns, answering questions, interviews, public meetings…

- Elaboration of a contractual and ethical framework to overcome mistrust

  Precautionary principle, open and honest information, problem solving attitude (opposed to outside expertise), commitment to improve the situation, voluntary involvement…

- Setting up procedural ways through which stakeholders can be effectively involved in the rehabilitation process

  Public meetings, task forces, advisory groups, working groups…

1. Development of respectful relationships with the affected populations and the relevant stakeholders (cont.)

- Empowerment and training of local communities

  Access to relevant information, practical training on radiological protection including measurements, developing job training related to rehabilitation in the community affected (i.e. radiametrist)

- Providing technical assistance to local communities

  Placing relevant radiation protection equipment at the disposal of interested stakeholders, access to independent technical expertise and to professional facilitators and mediators,…

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THE STAKEHOLDER INVOLVEMENT PROCESS

2. Characterisation of the local situation in co-operation with voluntary stakeholders

- Collection and interpretation of available information on the radiological situation (statistical approach)
  Environment, health, quality of foodstuffs,…
- Identification of issues and problems according to the specific contexts
  Influence of local traditions, habits and diet, organisation of the local production and distributions,…
- Individual measurements of the external ambient dose rates and the contamination of food products
  Direct measurement by the stakeholders or indirect measurements in co-operation with professionals

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2. Characterisation of the local situation in co-operation with voluntary stakeholders (cont.)

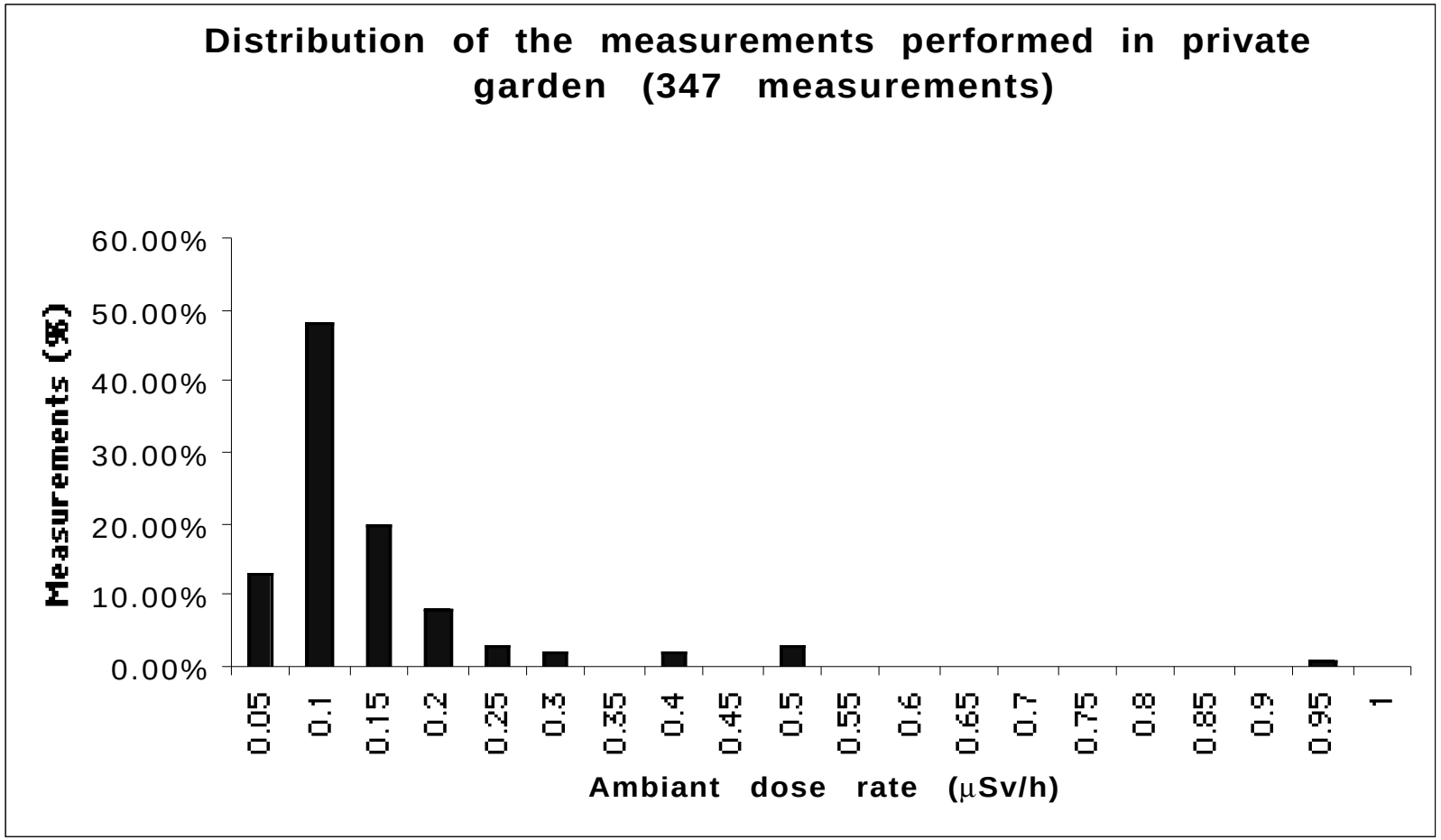
The key role of individual measurements

- Gives each individual a means to get a grip on its own day-to-day environment (at home, in gardens, in recreational areas…)
  Reference values (natural background ?), comparison with statistical values of the region…

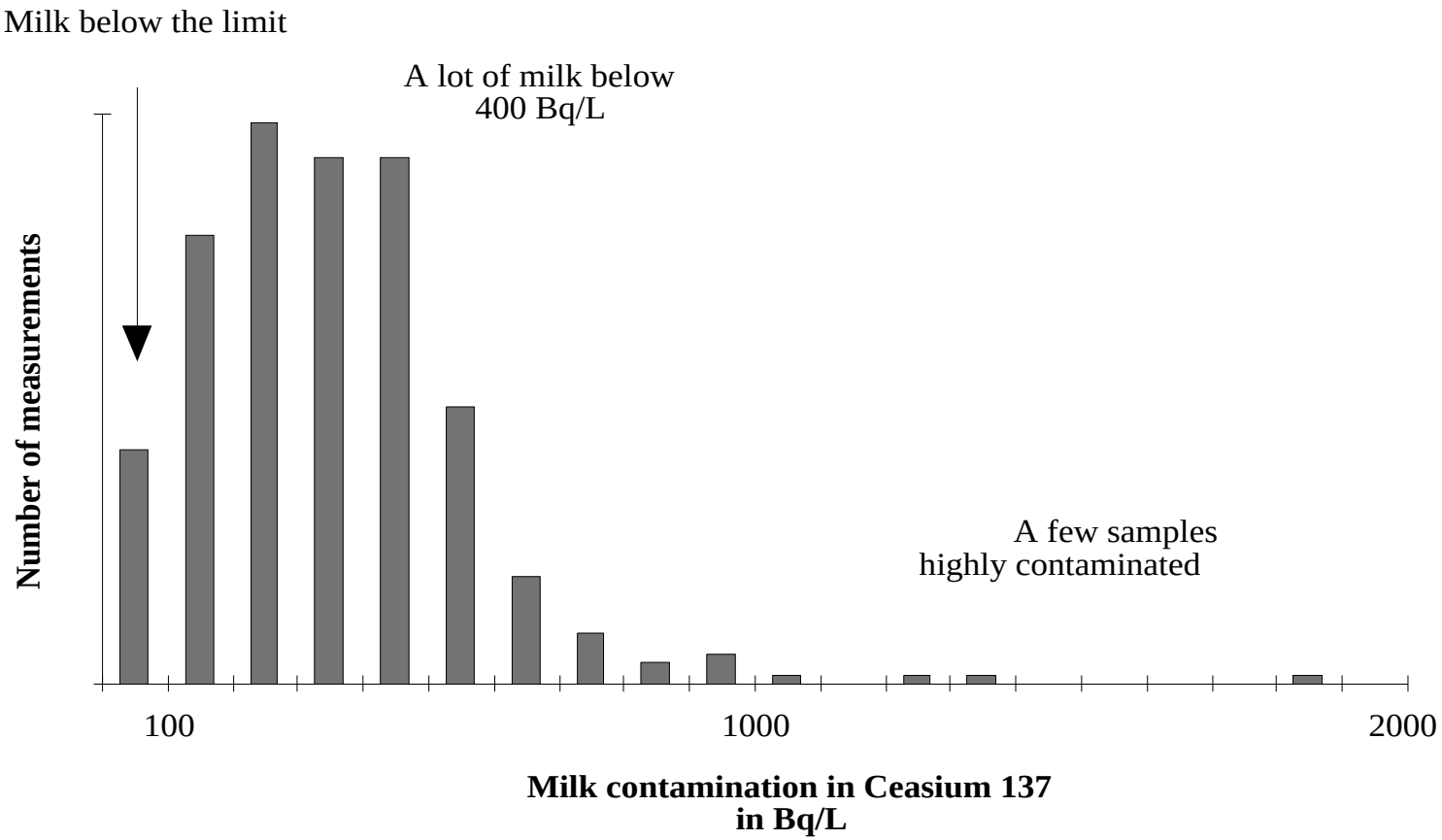
- Reveals the non-homogeneity of the local contamination, the large distribution of individual exposures in relation to behaviours, and points out potential for improvements

- Need to provide adapted capacities for measurements
  Robust and easy-to-use measurement instruments, local network and expertise,…

AMBIENT DOSE RATES IN GARDENS



DISTRIBUTION OF THE MILK CONTAMINATION OF PRIVATE FARMERS IN THE VILLAGE OF OLMANY



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THE STAKEHOLDER INVOLVEMENT PROCESS

3. Construction of choices reflecting the local context and the concerns, constraints and values of the affected parties

- Identification of possible actions to improve living conditions complementary to the 'national rehabilitation programme'
- Evaluation of the alternative actions incorporating the individual and collective constraints and values

  ALARA approach based on quantitative or qualitative assessment
- Selection of actions on broad-based consensus

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INFLUENCE OF THE LEVEL OF CONTAMINATION OF FOODSTUFFS ON THE DAILY INTAKE OF A CHILD

		Maximum contamination		Minimum contamination	
Foodstuff	**Grams**	**Bq/kg**	**Ingested Bq**	**Bq/kg**	**Ingested Bq**
Bread	250	60	15	10	2.5
Butter	10	400	4	30	0.3
Vegetable soup	300	100	30	10	3
Meat	200	300	60	10	2
Stewed apples	150	100	15	10	1.5
Sauerkraut	300	50	15	10	3
Potatoes	100	100	10	10	1
Stewed moorberries	200	2000	400	100	20
Chocolate milk	100	2000	200	10	1
		Total	**749**	**Total**	**34.3**

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RANGE OF LEVELS OF CONTAMINATION OF THE KEY FOODSTUFFS CONSUMED IN OLMANY

Foodstuffs		^{137}Cs contamination (Bq/kg)		
		Minimal	**Maximal**	**Concentration limit (1996)**
Sensitive	Mushrooms (Fresh)	400	16000	370
	Berries	100	3600	185
	Fresh milk	10	2000	111
	Pork	10	300	370
	Veal	around 100		
	Fish	50	2000	
Slightly sensitive	Beetroot	20	40	100
	Potatoes	10	100	100
	Cabbage	20	60	100
	Home-baked bread	around 50		
	Eggs	0	10	
Uncontaminated	Shop-bought food and food from uncontaminated areas	A few Bq/kg		

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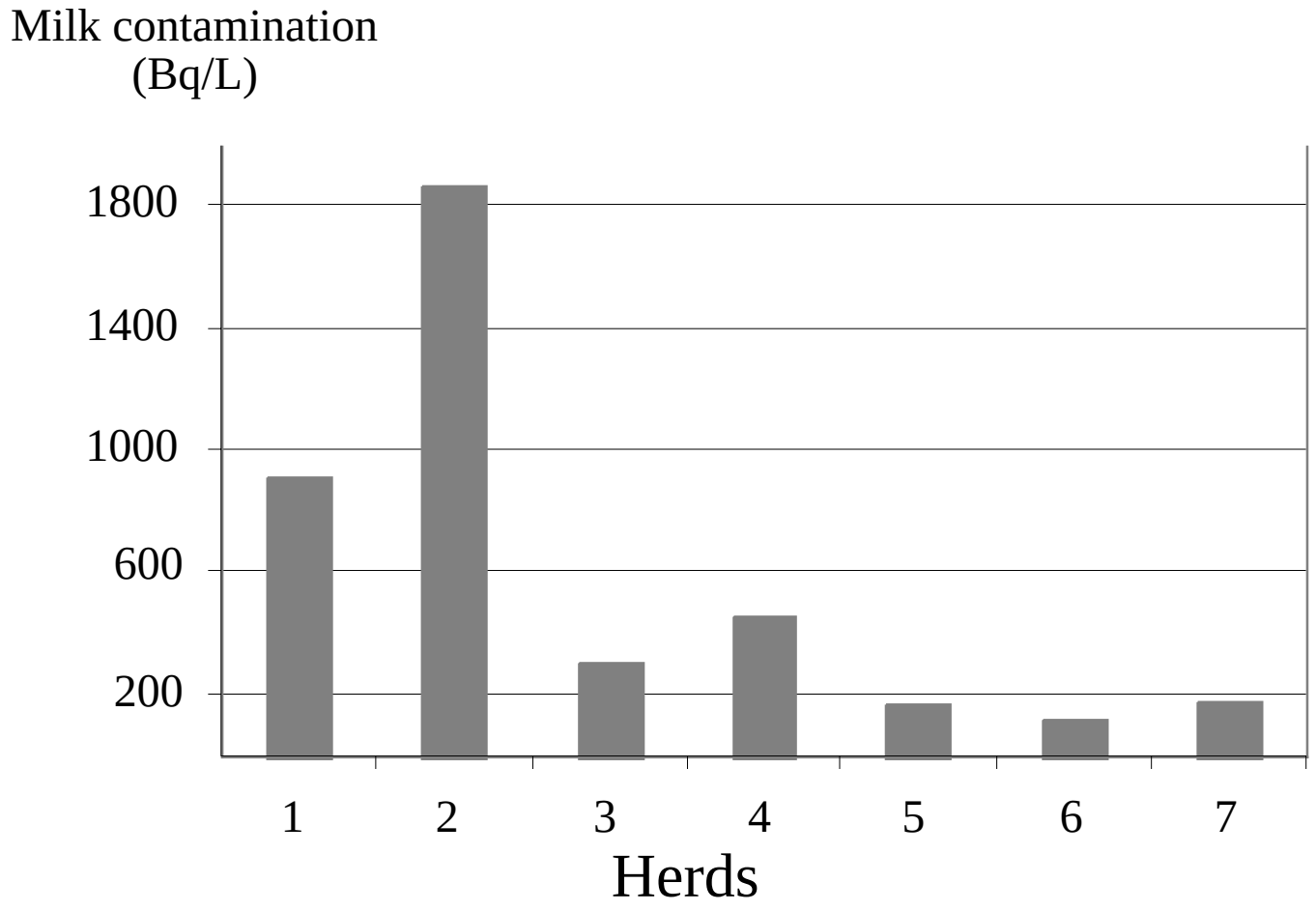
LEVELS OF MILK CONTAMINATION ACCORDING TO THE HERDS OF PRIVATE FARMERS



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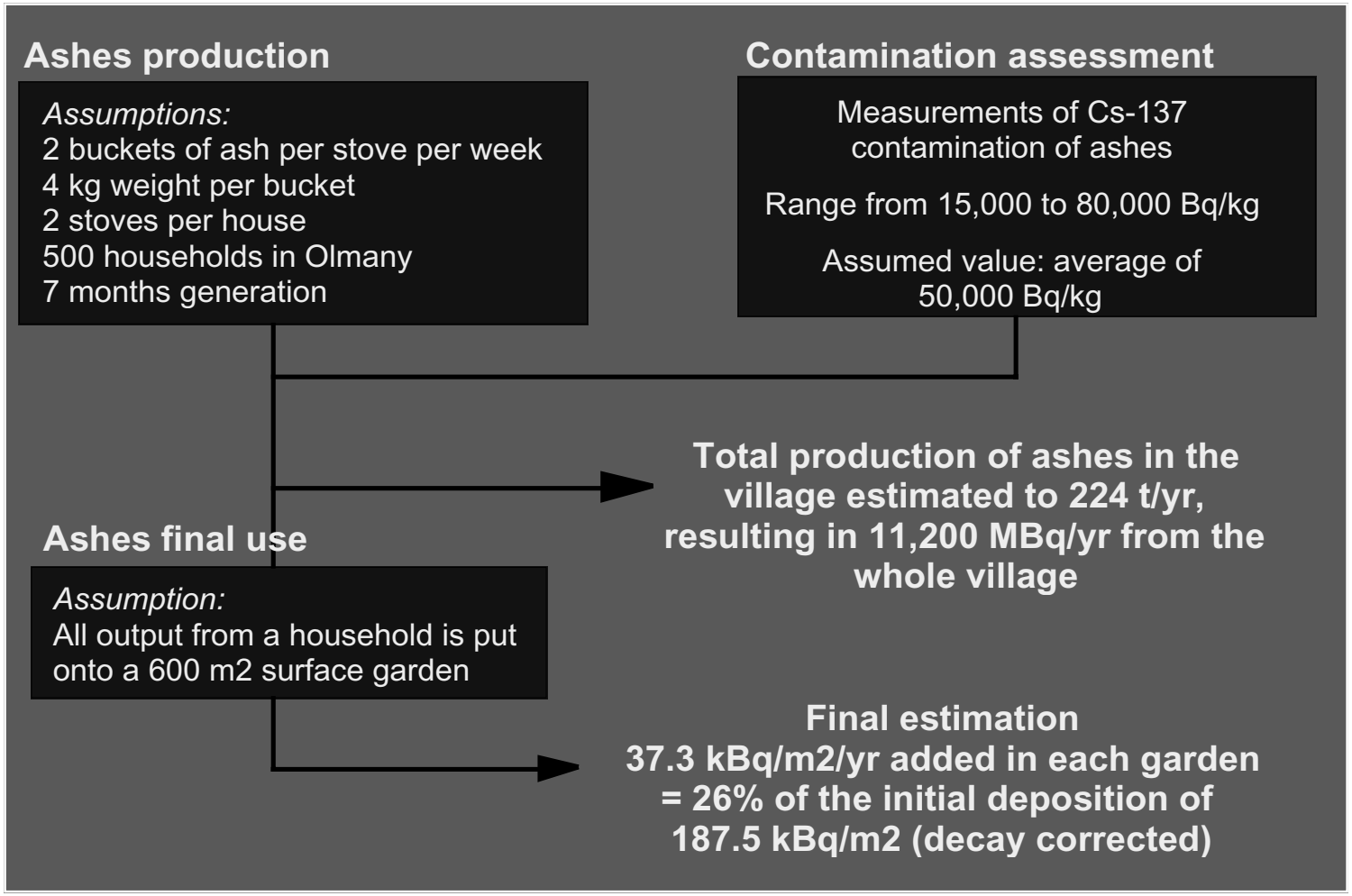
MODEL ELABORATED IN CO-OPERATION WITH THE VILLAGERS FOR ASSESSING THE IMPORTANCE OF FIRE-ASHES ON THE CONTAMINATION OF THE GARDENS



THE STAKEHOLDER INVOLVEMENT PROCESS

4. Development of a day-to-day radiological protection culture relying on personal commitment

- To ensure the effectiveness and the sustainability of the rehabilitation actions

  Key role of the educational system to transfer the safety heritage

- To favour the adoption of a prudent and responsible attitude in the management of daily life

  Development of guidelines and tools to provide advice on the behaviours in a contaminated environment - 'ALARA attitude'

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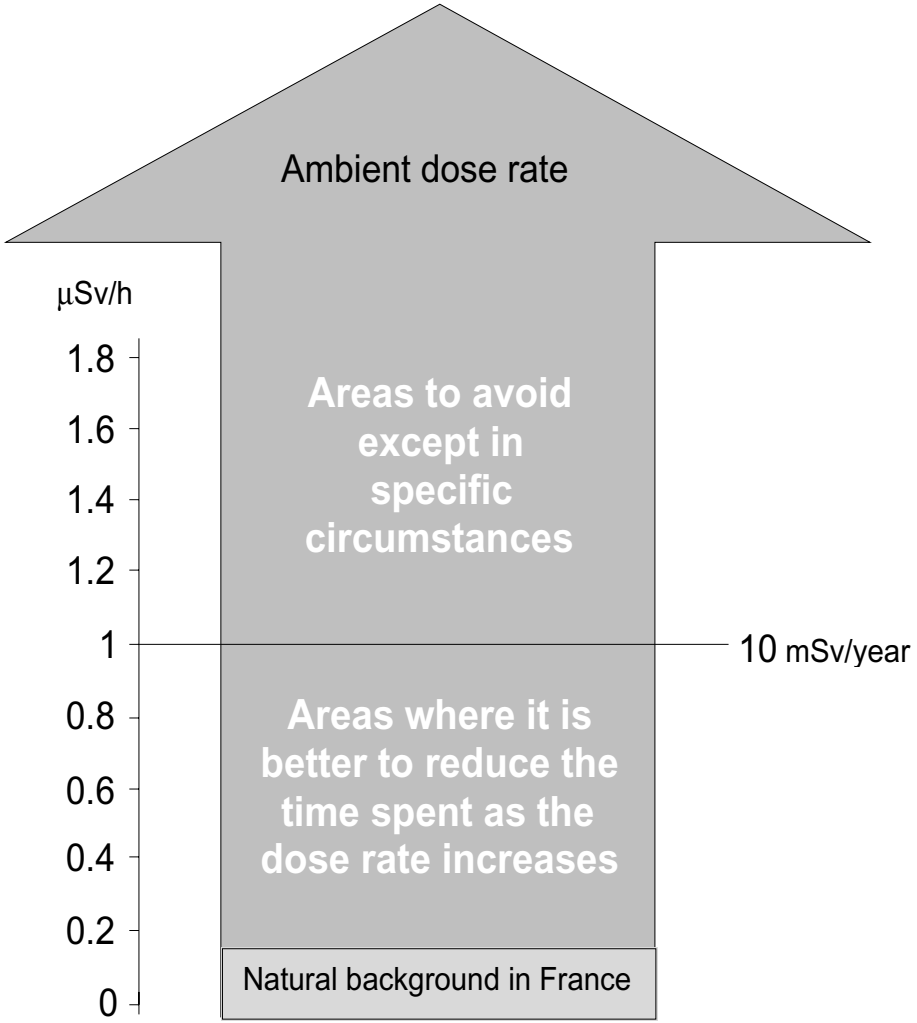
A TOOL TO HELP VILLAGERS TO CONTROL EXTERNAL EXPOSURES: THE AMBIENT DOSE RATE SCALE



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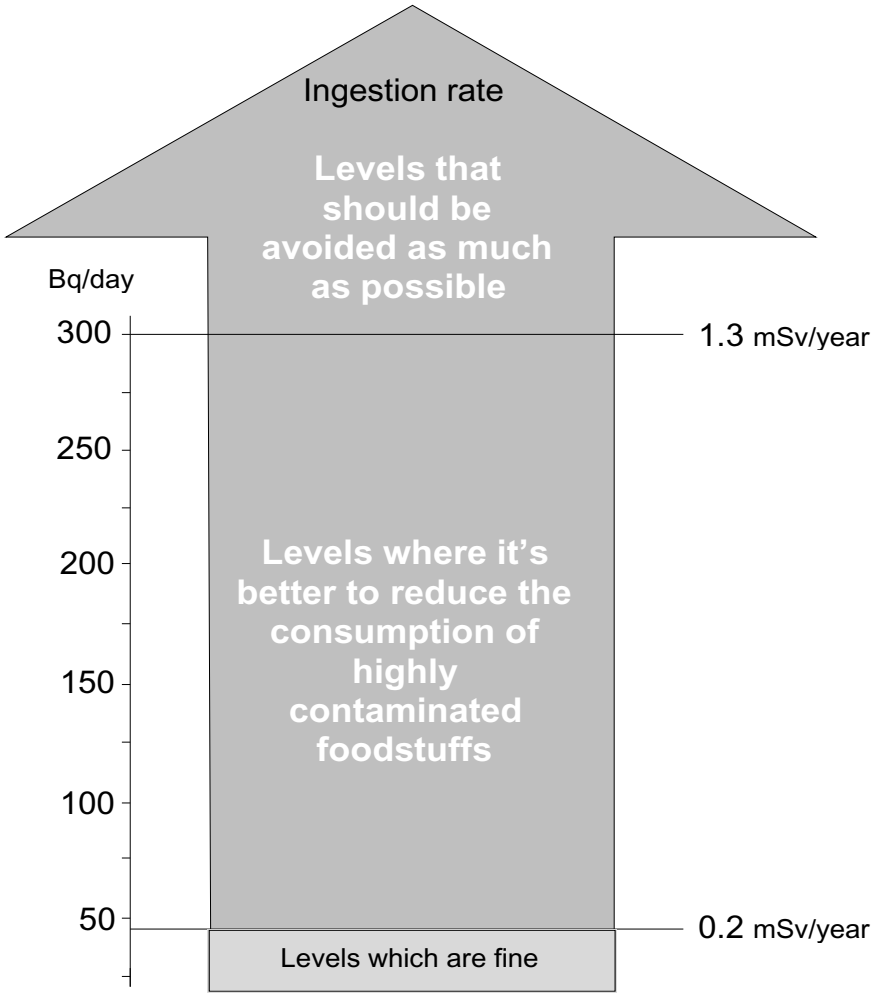
A TOOL TO HELP VILLAGERS TO CONTROL INTERNAL EXPOSURES: THE INTERNAL CONTAMINATION SCALE



SOME LESSONS FROM THE ETHOS PROJECT

The involvement of local communities is a strong means to:

- Take into account more effectively the specificity of the individual contexts and concerns
- Insure adhesion, maintain vigilance and avoid later controversies (sustainability)
- Adopt more cost-effective actions
- Improve social trust and public confidence
- Promote accountability and autonomy of concerned parties

SOME LESSONS FROM THE ETHOS PROJECT

The role of radiological criteria:

- As long as limits are interpreted as boundaries between safe and unsafe, they are a blocking factor for the involvement of the affected populations in the rehabilitation process

- When stakeholders are involved into the rehabilitation process, radiological criteria become benchmarks to guide day-to-day actions and behaviours

SOME LESSONS FROM THE ETHOS PROJECT

The role of the radiological criteria (cont.):

- Radiological criteria for rehabilitation cannot be implemented without referring to limits for ‘normal conditions' and average levels of natural exposure

- To promote radiological protection in everyday life, radiological criteria have to be related to exposure scales allowing individuals to adopt a prudent and responsible attitude (ALARA in day-to-day life)

SOME LESSONS FROM THE ETHOS PROJECT

Challenges for the radiation protection community

- Development of measurement equipment adapted to day-to-day life
- Building capacities in staffs involved in the rehabilitation process to interact with stakeholders
- Adoption of a 'co-problem-solving' position instead of an 'outside-expertise' position