

Irwa Project

Building an Adapted Strategy for Extension Services: Case Study on Integrated Fertilization promotion

Venue: NCARE Center of Baqaa - Jordan

Date: 22^d of November 2007

WORKSHOP'S CONCLUSIONS



With the participation of GTZ, MIRRA and APREL



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AGENDA

Part 1. Presentations

- I. Overview of the current fertilization practices and constraints in Jordan and Lebanon (IrWa)
- II. Reclaimed Water Project extension approach (GTZ)
- III. A project- based field extension service in the Jordan Valley (MIRRA)
- IV. Building a pilot extension service in collaboration with NCARE (IrWa)
- V. Cooperation between the university and the private sector: the Potash Company (JUST)
- VI. LRA and NCARE Extension service strategy: the HEPTTP program for NCARE (NCARE)
- VII. LRA Extension and Service Centre: Work Plan
- VIII. Case Study of an extension strategy developed by APREL, a France based research centre

Part 2. Mind-map presentation, discussion and group work

Part 3. Presentation and joint analysis of conclusion in plenary.

ABBREVIATIONS

APREL	Association Provençal de Recherche Expérimentation Légumière.
GTZ	German Agency for Technical Cooperation
HEPTTP	Horticulture Export Plan and Technology Project
IrWa	Improvement of Irrigation Water Management in Lebanon and Jordan
JUST	Jordan University for Science and Technology
LRA	Litani River Authority
MIRRA	Methods for Irrigation and Agriculture
INRA	
CTIFL	
NCARE	National Centre for Agricultural Research and Extension

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Introduction

IrWa Project (Improvement of Irrigation Water Management in Lebanon and Jordan Project), in collaboration with GTZ, MIRRA and APREL, conducted a one day workshop to develop a better understanding for possible improvement of the agricultural extension service in Jordan and Lebanon.

Based on a case study on "integrated fertilization promotion" in Jordan and Lebanon, this workshop aimed at developing recommendations for implementing effective extension services, taking into consideration the present social and technical background and the existing conditions of the extension services users and institutions. The analysis based on the experience gained by key stakeholders and incorporated their viewpoints.

The workshop brought together concerned farmers, representatives from the private and public extension service, government authorities concerned with agricultural extension, private sector companies, research institutions and universities as well as project personnel from donor agencies and NGOs.

The workshop was conducted in three phases:

1. Creation of a common ground with presentations on lessons learnt on extension work from different perspectives, as well as case studies;
2. Stakeholders' analysis of their experiences and lessons learnt using a common analysis tool (*mind map*);
3. Joint analysis and conclusion in plenary.

Part 1. Presentations

The following is a brief summary of each presentation, including the information provided by the lecturers on the basis of the feedback, questions and comments that followed the presentation. All presentations are attached in their original form in the annex!

Presentation 1 – Samir Jabbar/GTZ¹

*Water management in Irrigated agriculture – WMIA, Reclaimed Water component:
The Extension approach*

The project main objective was to ensure that farmers ability to use safely and efficiently the reclaimed water available, considering that reclaimed water contains significant amount of nutrients, to be taken into consideration for the definition of fertigation program. The importance of the use of reclaimed water depends on the fact that Jordan is an extremely water scarce country, and there are no other options for water availability in agriculture.

The implementation consisted in two phases: in the first, demonstration trials were realized during three years for the collection of data, leading to the elaboration of recommendations; in the second, the dissemination of the recommendations has started.

The project produced two extension tools namely: the Guidelines for the use of reclaimed water both in English and Arabic language and the Fertigation Excel sheet to calculate nutrients and water requirements in a form accessible to the farmers. The guidelines have been elaborated with the consultation of all relevant Jordanian organizations and are now available to interested parties. The final version was reviewed and approved of governmental bodies.

The dissemination aims to reach 1000 farmers, and to ensure that 500 implement the recommendations. The dissemination methodology includes: field days, workshops, training of trainers and farmers training.

The following main problems were identified: farmers are fertilizer-oriented, tend to over fertilize especially in high prices period, while the institutional commitment is insufficient to ensure a proper farmers' follow up.

Presentation 2 – Nour Habjoka (MIRRA)

*“Support to the Fruits & Vegetables Commodity System”, a pilot project 2001-2007
Highlighting the fertilization component of Technical assistance*

The project has been realized by the Regional Mission for Water and Agriculture (MREA) of the French Embassy and by NCARE, with the objective of testing the possibility of shifting from traditional cropping pattern to high added value crops, for the benefits of small and medium producers. The methodology relied on a market oriented approach, with high quality as ultimate goal, addressed to organized group of producers of a specific crop, the Charentais melon.

¹ For details of each presentation please see Annex 2.

The methodology included: weekly visits to the farmers, on-farm experimentation of techniques, exchanges with other experiences and technical support by French experts. As tools, technical guidelines and brochures were produced, and the PILazo method for monitoring and control on nitrogen was introduced. This last tool has been tested and recommended for being very practical, accurate and independent of geographical location and climatic conditions. The content of Nitrate represents in fact the most suitable indicator for the availability of the element. The importance of Nitrogen management was especially important for the impact on the quality of Charentais melon.

The results have been judged satisfying: many farmers have been able to produce high quality melon, NCARE capacity to provide services to farmers has been increased, and the application of nitrogen has been lead to zero for a complete season. Nevertheless, the following constraints can be identified: the initial level o nitrogen in the soil was very high, and therefore difficult to manage, the technical assistance provided by the project is costly, the interference with private sector advice and recommendations lead to confusion, the PILazo method results sometimes not easy to understand for the farmers. Technical information and discussion on the use of this topic would be recommended. Another recommendation is to focus on the communication skill of technical assistants as a main asset for the establishment of collaboration with the producers.

Presentation 3 – Adrien Peyre (IrWa)

Building a pilot extension service in collaboration with NCARE

In the framework of MEDA policy, IrWa project has developed, in collaboration with NCARE, a pilot project of extension serviced for farmers to tackle fertilization technical constraints. To do so, the project had developed a bottom-up approach based on technical field assessment done in collaboration with farmers from the Jordan Valley.

Following the assessment, 6 extension agents were trained on integrated fertilization methodology. External expertise provided by GTZ, MREA private companies and APREL completed the training organized by internal staff and NCARE specialists. Pilazo technique of NO₃ management, GTZ excel sheet of fertigation and adapted injection devices (fertigation tanks and Dosatron) were adopted and used on the field. An additional technical kit, composed by a fertilization assessment program, 10 technical sheets, working procedures, and task definitions, was provided to NCARE in order to ensure sustainability of its activities. 200 farmers are expected to be trained on integrated fertilization practices.

The project was confronted to 5 majors constraints: the difficulty to collect accurate data from the on farm demo sites organised, the high turn over of farm staff and the absence of farm owners on the field that limit the possibility of behaviour modification, the high competition with private extension services resulting in conflicting technical advises, the difficulty in the use of DOSATRON and the low availability of extension agents provided by NCARE (only 2 days/week).

As major recommendations, capacity building of local extension agents should be improved with adapted methodology and communication skills. Training session should not be addressed only to farm owners but also to permanent staff that frequently deal with field constraints. Farmers associations should be developed and supported to enhance the bottom-up

approach in the extension activities planning. Finally, NCARE need to focus on applied research and develop specialised services with skilful staff on the following topics: fertilization, irrigation, pest control and post harvesting.

Presentation 4 – Dr. Munir Rusan (JUST)

Cooperation between the university and the private sector

The project started in 2001 and is still operating; it represents an interesting example of co-funded projects in the whole Arab World with 50% of participation by Jordan University for Applied Sciences and Technology. It was aimed to introduce an innovative technology in fertilization management, with the development of a cooperation framework between farmers, researchers, extension agents and private sector. The benefit for the private sector is to become involved in the development of environmentally sound use of fertilizer, demonstrating its concern and ability to cope with this challenge.

The starting point has been a survey for the needs assessment, and the definition of monitoring indicators. The main problem detected in farmers' fertilization management is over-fertilization, especially with nitrogen, while phosphor is neglected. The goal is a balance for fertilization.

As methodology, a contract was signed with farmers for the definition of the conditions of the demonstration sites. On the bases of this agreement, researcher and extension agents install the innovative fertilization technology, based on soil analysis and injection tools. The results were compared with traditional practices that the farmers continue to apply in other part of the field. The method has been applied to two main crops, cucumber and cut flowers.

As tools, field visits, field days, on farm training, and an accurate documentation of all practices performed have been developed. Communication media, as TV, radio and newspapers have been involved in the dissemination strategy, with the production of articles, announcements, radio emissions.

Main constraints were found in the slow flow of information through government channels and insufficient collaboration between extension staff and researcher. Main recommendations were: advices to farmers must be fact based, and trust building is necessary.

Presentation 5 – Said El-Zuraiqi

The HEPTTP program for NCARE: methodology for fertilization management

The project, implemented in the period between 1998 and 2001, represents an example of methodology for the improvement of fertilization management by the farmers. The objectives were the optimization of water and fertilizers efficiency and the improvement of extension agents' and farmers' technical skills, introducing tools as Dosatron and Venturi devices.

The extension methods used were represented by lectures and field training for extension agents, in trial, demonstrations and field day for farmers.

The project met the following main constraints: the difficulty to meet the farmers, since they are often absent from the farms (which are left to permanent labourers), the high cost of the

devices, and the difficulty of calculations for the stock solution, both for extension agents and for farmers.

As main recommendations, an improvement of the adaptation process for the new techniques was recommended, based on careful evaluation of the techniques and strengthening of the extension agents' skills.

Presentation 6 – APREL

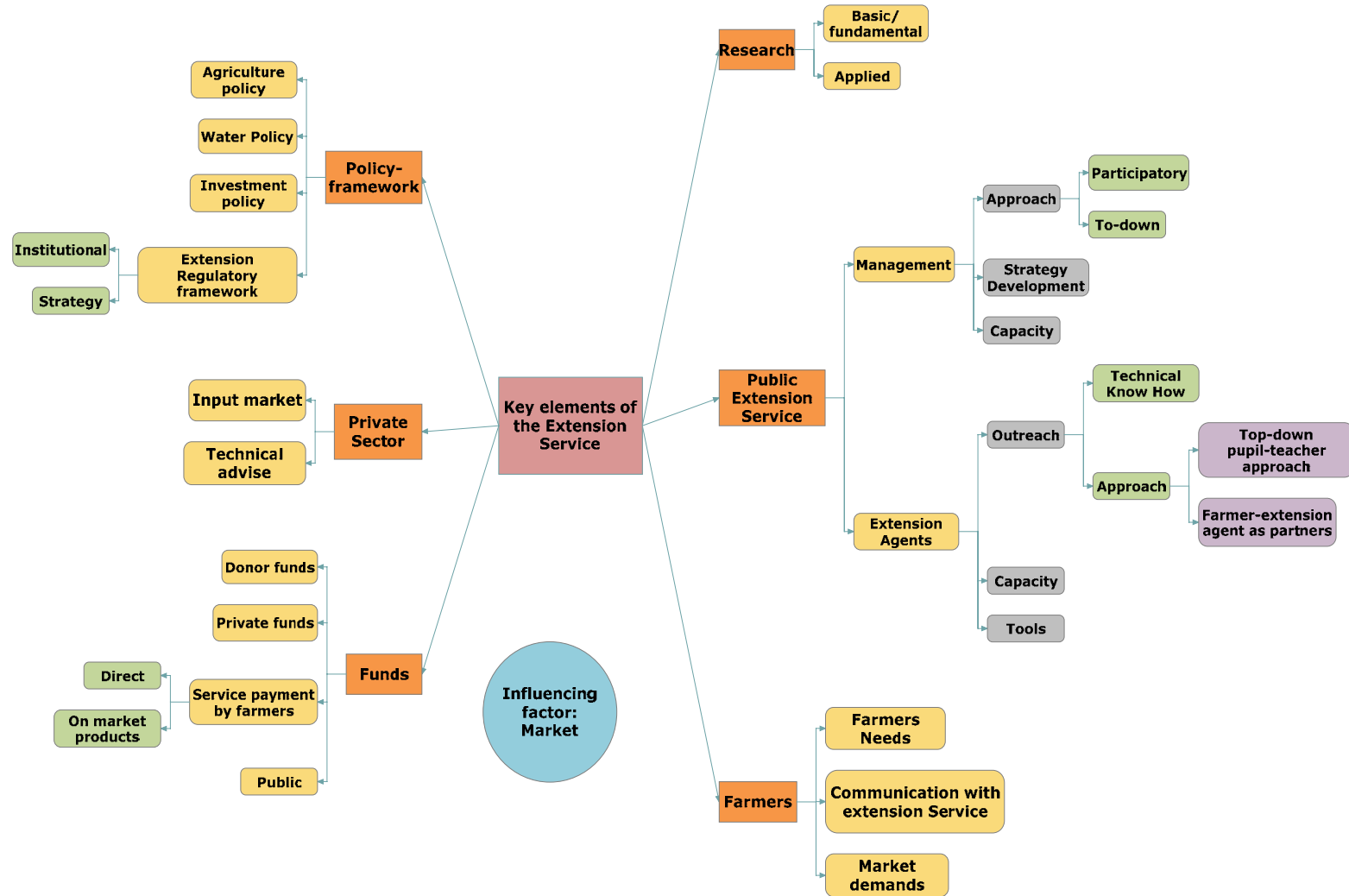
Case Study of an extension strategy developed by APREL, a France based research center

APREL is an applied research center for vegetables production based in the south of France. This non-profit organization was established in 1984 to implement on farm experimentations on 4 main topics: variety screening, integrated pest management, soil fertility and post-harvesting management.

Its annual budget is estimated by 800,000.00 euros is provided 30% through self financing, 60% through public aid and 10% through private funding. The center works in close collaboration with INRA and Ctifl that are responsible of the fundamental research and to provide scientific support. The extension messages are provided by APREL and by extension agents from farmers' associations and chambers of agriculture. Technical reports and technical sheets are produced and field days organized for all the stakeholders. The planning of applied research is done in cooperation with farmers and extension agents that are in charge of identifying the technical problems. APREL, CTIFL and INRA are responsible of the demo plots proposal. After that the proposal is accepted by the farmers, APREL and the extension agents from farmers' associations and chambers of agriculture organize the trial on the farmers' field. The experience of the PILazo melon methodology elaboration was given as example of bottom-up approach to solve a quality problem.

To promote a better extension service, NCARE should strengthen exchanges between extension services and farmers through regular technical meetings and field visits. In France, the reinforcement of farmers associations able to employ their own extension agents was the first step for the set up of extension services. In addition, the national center should focus more on applied research strategy based on farmers' technical needs. The role of farmers should be enhanced in the planning and implementation of the experimentations. Finally a clear strategy of vulgarization should be defined, and supported by the redaction of technical sheets and reports, and field visit during the cropping season with a clear technical message addressed to farmers.

MIND MAP



Mind map methodology

The facilitator presented a mind-map elaborated by the workshop organization team, based on the presentations provided by the lecturers before the workshop. The mind-map contains the main elements related to extension services, without attribution of values or interaction analysis.

The objective of the mind-map graphic was to provide a tool for the discussion in the work groups, avoiding the one-dimensional "group-thinking" that homogenous working groups are possibly facing. Group-thinking is when members of a homogenous group tend to see reality according to their understanding, as per their experience and resist offering views that differ markedly from the "norm" of the group. The mind-map with its many stakeholders and issues is intended to enable the group to take a broader, more inclusive view.

During the mind-map presentation, suggestions were taken from the plenary and immediately included into map. This process led to additions and modifications of the original mind map, until the final version was included in the present report.

In order to take into consideration influencing factors that affect all elements without a specific connection with one or more, these factors were represented as isolated elements (e.g. market factors).

Part 2 - Group Work

In part 2 of the workshop, participants were divided into five working groups to analyze the challenges they faced with extension work and the solutions they would advocate to face these challenges. The main elements of the mind-map guided their analysis.

Comments from the presenters precede matrix, when it is the case.

Bold lines were areas of priority, according to the indications provided by each group.

Group 1 – Farmers

Constraints	Solutions
<i>Farmers' needs</i>	
Lack of updated knowledge	Supply of continuous information and knowledge through visits, training & demo sites
<i>Communication with Extension Service</i>	
Transportation	Increase number of cars and facilities
Poor extension agent skills	Upgrade extension agents' skills through trainings
Usual absence of farmers	Visits should be prepared by phone in advance
Difficulties in changing farmers' mentality and attitude	On-farm demo sites. Farmer-to-farmer approach. Build trust between extension agents and farmers.
<i>Market demands and international standards</i>	
Lack of awareness and funding	Improve awareness through trainings, workshops, brochures, F.D., D.P. ... Financial supports for infrastructure, consultation and fees.
Non-activated local regulations	Activation of local regulations
<i>Agricultural practices</i>	
Lack of information about new technologies	Update farmers on new information and technologies through: exhibitions, trainings, media and field days
<i>Socio-economic status</i>	
Farmers are not the owners of the land	
Poverty	Encourage farmer cooperatives to reduce costs by sharing inputs
High cost of inputs	Governmental financial support for agricultural inputs
<i>Knowledge of farmers about tools and instruments</i>	
Educational level	
<i>Farmers' organizations</i>	
Weak and few farmers' organizations	Build new organizations and activate them.

Group 2 – Extension Services

The group failed to come out with solution, probably because they live with the problems/constraints everyday. Solutions may have been more difficult to find from within the group itself.

A suggestion was made of using the same amount of resources over a smaller number of staff. This means to provide them with better salaries, more logistic facilities and therefore more satisfaction as a consequence.

A proposition for outreach efforts is to make use of the many new radio stations and create a special agricultural radio station/program that could provide a platform for fresh communication and information.

Constraints	Solutions
<i>Extension Agents</i>	
Lack of incentives, transportation, work routine.	<ul style="list-style-type: none"> ▪ Provide more performance-linked incentives → salaries and income linked to achievement. ▪ Provide clear strategy with clear job description.
Lack of specialized, qualified workers	<ul style="list-style-type: none"> ▪ Hire only competent persons with good communication skills. ▪ Provide continuous updating of knowledge.
Not enough resources (both human and material)	<ul style="list-style-type: none"> ▪ Create funds through less, but more efficient, extension agents. ▪ Ensure commitment of decision-makers to increase resources and freedom.
<i>Management</i>	
No clear vision for the future	<ul style="list-style-type: none"> ▪ Create objective-oriented job description and need-oriented programs
No real strategy	
No fixed jobs and positions	

Group 3 – Private Sector

The private sector shares many of its constraints with the Public Sector and yet the major problem was the lack of communication between the two sectors. Farmers prefer to follow the recommendations of the private sector since they provide their services in advance and accept their payments at the end of the season – which is when farmers would normally pay. The main constraints that face this industry have changed over the years from maximizing and optimizing to quality control to environmental impact.

Private sector companies each have their experimental stations and hold many workshops and trainings. The private sector doesn't really have extension agents, but rather they have marketing agents. Marketing agents work on selling various product to the farmers acquiring at the same time the knowledge about their product and skills of efficient marketing.

Constraints	Solutions
<ul style="list-style-type: none"> ▪ Lack of connection/communication between public extension and private sector. ▪ Private sector extension (marketing) agents are indirectly (through pay of input) held responsible for their advice (warranty). 	<ul style="list-style-type: none"> ▪ Increase communication between the private and public sectors through elaborate plots in common, meetings, contacts, financing experiments (by private sector)... ▪ Create boards (PIP) to elaborate/monitor strategy. ▪ Accreditation and testing of products to be endorsed by the public sector.
<p>Scarcity of resources: staff, tools, transports.</p> <p>Extension agent experience needs a long time to fully develop</p>	<p>Develop links between farmers and universities.</p>
<p>Difficulty to change the farming practices and convictions of farmers</p>	<ul style="list-style-type: none"> ▪ Integrate the farmers in the new techniques. ▪ Provide the extension service demanded by the farmers for a fee.
<p>Farmer-ownership of the land</p>	
<p>The educational level of the farmers vs. the ability to deliver a message to them</p>	<p>Deliver a simple message.</p>
<ul style="list-style-type: none"> ▪ Finding the right person to speak to on the farm. ▪ Farmers are not always present in their farms 	<ul style="list-style-type: none"> ▪ Inform about planned visits. ▪ Provide incentives for the farmers to receive the extension agents.
<p>No updating of knowledge for extension agents – public sector constraint</p>	<ul style="list-style-type: none"> ▪ Follow up with and accredit extension agents (from JISM). ▪ Intense practical training. ▪ Frequent field visits to increase learning.
<p>No clear strategy for extension agents – public sector constraint</p>	<ul style="list-style-type: none"> ▪ Define a clear over-all strategy (not on a project basis). ▪ Develop specific programs (strategy) answering to field priorities. ▪ Train specialized extension agents

Group 4 – Universities / Research Institutes

The constraints form a vicious cycle, leading all from one to another. The suggested solution is proposed on the national level so that it may avoid localized bureaucracy and link researchers with specific research centers, funds etc. The formation of committees would be a shared platform for private sector, stakeholders, researchers, to exchange knowledge, experience and resources.

Constraints	Solutions
<i>Researcher</i>	
No research orientation and motives	<ul style="list-style-type: none"> ▪ Establishment of a semi-public information center. ▪ Set up technical committees for research and extension and invite all stakeholders.
Lack of links between academic institutions and the actual field	Establishment of “Action-Research Center” within universities
Lack of collaboration among local institutions	
<i>Type of Research</i>	
lack of information on local context (i.e. socio-economic conditions, political, technical ...)	
Bureaucracy in fundraising and access to information (statistics, maps...)	Establishment of a center, at national level, to support applied research in fundraising, partnerships, information...
Teaching tools → theory does not apply to the local status	

Groups 5 – Donors / NGOs

Donors fund mainly projects and this leads to lack of continuity in the activities.

Furthermore, sometimes is difficult for all the projects to find locally the necessary skilled staff.

The group also suggested NCARE to set up a pool of experts that could be helpful to orientate donors' action..

Constraints	Solutions
<p>Lack of available staff for technical assistance</p> <ul style="list-style-type: none"> • lack of motivation • lack of mean: cars ... • no clear task descriptions • no clear institutional mandate 	<ul style="list-style-type: none"> ▪ Better organization of extension activities. ▪ Improvement of staff management. ▪ Develop and extension strategy: when, what and how to make a specific activity.
<p>Starting projects takes too long</p>	<ul style="list-style-type: none"> ▪ Flexibility in the financing of the projects
<p>Scarce flow of information</p>	<ul style="list-style-type: none"> ▪ Collection and processing of data (surveys, reports, studies ...)
<p>Lack of trust by farmers</p>	<ul style="list-style-type: none"> ▪ Involve the farmers in “finding” problems and solutions
<p>Conflicting interests of donors</p>	<ul style="list-style-type: none"> ▪ Initiate dialogue on extension → the content of technical assistance is derived from discussion and experimentation
<p>No pool of extension service experts (capacity problem)</p>	<ul style="list-style-type: none"> ▪ NCARE should provide pools of experts in extension activities: specialized in technical assistance.
<p>Lack of continuity in providing services → services are too dependant on donors' project</p>	<ul style="list-style-type: none"> ▪ Improve coordination between donors (unification of strategy)

Wrap up and Conclusions

On request of the participants, the organizers, as well as the main stakeholder, NCARE, promised to resume and discuss the workshop's main recommendations, creating new opportunities for communication between the stakeholders. The six following levels of recommendations for the improvement of Extension services, resuming the main results of the work groups, are proposed for further analysis:

Institutional

- Build a proper framework
- Develop a clear and stable mandate

Technical

- Create specialized services (fertilization, irrigation, pest management, post harvesting)
- E.A capacity building and technical skills (use of practical tools, communication skills)

Methodological

- Promote bottom up approach (farmers' focus group)
- Market and quality oriented

Human resources policy

- Tight relationship farmers/extension agents
- Clear job description and working procedure
- Career development planning

Networking

- Twin institutions in Europe
- Partnerships with private sectors and universities

Financial sustainability

- Increase support from private sector
- Consider financial participation from farmers



ANNEX 1: PARTICIPANTS PRESENTATION

MEDA Water  


Workshop

Building an Adapted Strategy for Extension Service: Case Study on Integrated Fertilization Promotion



MEDA Water  Improvement of Irrigation Water Management in Lebanon & Jordan 

Public Extension Service Availability

1. 1985: Creation of NCARTT 

3. From 1985 To 2006 : Extension service provided by NCARTT and MoA

4. 2007 Creation of NCARE: Centralization of services for farmers

Support from international cooperation: GTZ, MREA, EU, USAID, JICA...

MEDA Water  Improvement of Irrigation Water Management in Lebanon & Jordan 



Jordan Valley:

Since the 70th: Introduction of modern production technology

- Specialization of laborers
- Introduction of green house production
- Development of drip irrigation
- Development of fertigation techniques



Switch from traditional to modern production



MEDA Water  Improvement of Irrigation Water Management in Lebanon & Jordan 

Main constraints regarding fertilization

- ❑ Improper fertilization management by farmers
 1. Application of fertilization depending on farmers experience
 2. Few farmers refer to soil and water analysis
 3. Improper injection procedure
- ❑ Utilization of mixed treated water
- ❑ Little pressure from consumers for safety food production
- ❑ Absence of control bodies to check for G.A.P
- ❑ The private sector remains the main provider of T.A.

MEDA Water  Improvement of Irrigation Water Management in Lebanon & Jordan 



KEY QUESTION:

What could be done by each actor to improve the performance of the extension system?

MEDA Water  Improvement of Irrigation Water Management in Lebanon & Jordan 

Aim of the workshop:
identify strategies for implementing efficient extension services.

1. Presentation of the existing strategies developed to promote integrated fertilization practices in the region (guest speakers from: MREA/MIRRA, GTZ, NCARE, JUST University)
2. Case study of extension services strategy developed by APREL, a French applied research centre.
3. Group discussion to revise the needs and conditions for proper extension services in Jordan

MEDA Water  Improvement of Irrigation Water Management in Lebanon & Jordan 

Problems

Excess of fertilizer used
High environmental impact
Increase of production cost

NEED TO IMPROVE SERVICES FOR FARMERS

Water Management in Irrigated Agriculture- WMIA, Reclaimed Water Component

Extension Approach

Extension Tools

- Guidelines for the use of reclaimed water both in Arabic and English language
- Fertigation Excel sheets: calculate nutrients and water requirement (information appropriate for farmers)

Overview

- The project aims at ensuring that farmers using reclaimed water for irrigation are using it safely and efficiently.
- There are 3000 farm units (about 1500 farmers) in the project area irrigated by reclaimed water.
- Reclaimed water contain significant amount of nutrients that should be considered in fertigation program.
- During the past 3 years demonstration trials and intensive farms monitoring conducted by the project revealed that farmers using reclaimed water for irrigation can save up to 60% of the fertilization cost.
- Estimation showed that farmers in the middle Jordan Valley (DA 22 to DA 28) spend JD 7.5 million per season and JD 1.5 millions could be saved if 30% of farmers adopted project recommendations

Approach

- How to reach farmers ?
- Our target is to reach 1000 farmers and ensure that 500 implement the recommendations.
- The project in collaboration with JVA and MoA disseminate the fertigation recommendations through
 - 1- Field days
 - 2- Workshops
 - 3- Training of Trainers (JVA and MoA staff)
 - 4- Farmers training campaign

gtz



Farmers' training campaign

- 1000 farmers will be trained in the coming 2 seasons on the topic of fertigation.
- Intensive training campaign for farmers by MoA, and project staff (each session 1-2 hours for 15-20 farmers).
- Farmers get fertigation sheets for different crops.

gtz



Outcome

- Up till this moment 250 farmers were trained in the southern region of the project area.
- Farmers showed high interest and good response to the topic.
- The approach promotes the interaction and coordination between JVA, MoA and the project.

Vision: Irrigation water information service

gtz



Problems

- **Technical:** Farmers are fertilizer-oriented
- **Behavioral:** During high prices periods farmers tends to over fertilize their crops and forget what they have learned
- **Institutional:**
 1. Institutional commitment
 2. Limitation in the staff
 3. Farmers follow up

A pilot project 2001 - 2007: "Support to the Fruits & Vegetables Commodity System."

Highlighting the fertilisation component
of technical assistance.

Nour Habjoka, MIRRA.
November 2007

Methodology

- Weekly follow-up by field engineer
 - Holistic view,
 - Since early production stages.
- All recommendations complement each other and are directed towards a clear, ultimate goal:

A high quality produce 
- On-farm implementation & experimentation of techniques (fumigation, fertilisation, etc).



Project presentation

- The Regional Mission for Water & Agriculture – The French Embassy, in Jordan and NCARE – The Ministry of Agriculture.



- Objectives:
 - Testing the possibility of substituting traditional cropping pattern by a high added-value crop.
 - Benefit small- and medium-scale producers.



- A market-oriented approach, providing technical assistance to an organised group of producers for one specific crop.

- Exposure to other practices & experiences.



- Charentais melon French expert
 - adapted recommendations,
 - external point of view.



- NCARE active involvement in trials.

- PILazo® as basis for fertilisation recommendations and advice.



- Exposure to other practices & experiences.



- Charentais melon French expert
 - adapted recommendations,
 - external point of view.



- NCARE active involvement in trials.



- PILazo® as basis for fertilisation recommendations and advice.

PILazo® in practice

- Before planting
measure NO³⁻ in soil.



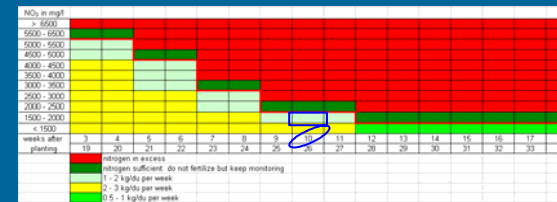
- After planting
measure NO³⁻ in sap, weekly.



1. Sampling
2. Sap extraction
3. Analysis



Result is compared to “grid of decision” indicating plant comfort with nitrogen levels.



Results

- Despite varied environments, many farmers were able to produce high quality melons.
- Success in reducing application of nitrogen to zero for a complete Charentais melon season.
- NCARE approachable for producers, offering services that fit the farmers' needs.
- Adoption of PILazo® tool by the association.



Main constraints

- Started off with excess nitrogen content in soil, which was difficult to control.
- PILazo® theory was not always easy to explain.
- Costly technical assistance offered by this project.
- Confusion due to private sector interference with advice & recommendations.
- Character & communication skills of technical assistant is a determining factor for capacity to contest with producer.

Conclusions and recommendations

- PILazo® is a strong tool, complimentary to other techniques to pilot other elements.
- The need for extensive trainings on PILazo® .
- Better coordination & definition of tasks between the different stakeholders, for better utilisation of resources.





Workshop
Building an Adapted Strategy for Extension Service: Case Study on Integrated Fertilization promotion

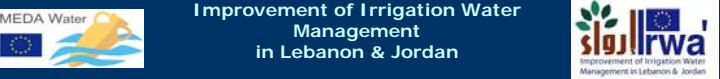
IrWa
Experience in building a pilot extension service for farmers




Improvement of Irrigation Water Management in Lebanon & Jordan

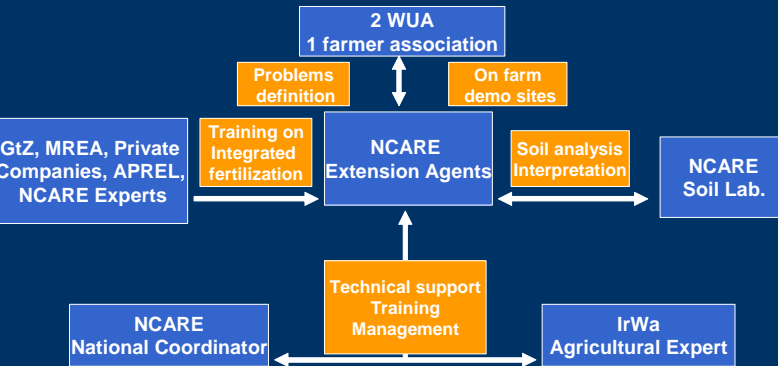
IrWa: a regional project (Jordan and Lebanon)

- Objective:** Increasing farmers income by improving crop production and minimizing on-farm inputs and O&M costs
- Financing:** European commission in framework of MEDA program
- Duration :** 2003 - 2008
- Main topics tackled:**
 - On farm optimization of Irrigation system
 - Promotion of Integrated management (pest and fertilization)
 - Support to Public Extension Service
 - River bed rehabilitation and management
 - Installation of filtering units at KAC



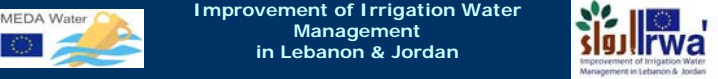
Improvement of Irrigation Water Management in Lebanon & Jordan

Methodology: Bottom up approach for pilot extension service



```


graph TD
    NC[NCARE National Coordinator] <--> TS[Technical support Training Management]
    TS <--> IA[IrWa Agricultural Expert]
    IA --> EA[NCARE Extension Agents]
    EA --> WUA[2 WUA 1 farmer association]
    EA <--> SI[Soil analysis Interpretation]
    SI <--> SL[NCARE Soil Lab.]
    EA <--> TIF[Training on Integrated fertilization]
    TIF <--> GtZ[GtZ, MREA, Private Companies, APREL, NCARE Experts]
    WUA <--> PD[Problems definition]
    WUA <--> OFDS[On farm demo sites]
  
```



Improvement of Irrigation Water Management in Lebanon & Jordan



Tools adopted

1. PILazo: eggplant, tomato, cucumber, pepper
2. GTZ excel sheet
3. Ferti tank and Dosatron





Tools developed

1. Technical sheets
2. IrWa excel sheet to assess farmer fertigation practice
3. Task definition and working procedure for EA
4. Training for farmers

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Expected Results

1. 7 Extension Agents **trained and working on the field**
2. 7 on farm demo **sites on integrated fertilization (PILazo)**
3. 2 experimentation trials in Deir Allah Centre
 - Mineralization of different kind of Organic matter
 - Closed soil less system
4. 30 fertigation tanks and Dosatron **used**
5. 200 Farmers trained **on integrated fertilization practices**

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Main constraints

1. **Difficult to collect accurate data on the demo site organized on farm**
2. **Difficult to change farmers practices**
 - Some farm owners are not dealing directly with technical issues
 - High turn over of farm staff
3. **High competition with private extension service**
4. **Dosatron not adapted for farmers with low technical know how**
5. **Low Extension Agent availability (only 2 days / week)**
6. **PILazo tools not distributed locally**

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Recommendations

1. **Reinforce Extension Agents methodology and communication skills**
2. **Organize training for permanent laborers**
3. **Develop/support farmers association to strengthen the bottom-up approach**
4. **Develop specialized service in NCARE (fertilization, pest management, irrigation, post harvesting)**

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Thank you






IrWa Project
 Building an Adapted Strategy for Extension Service:
 “Case Study in Integrated Fertilization promotion in Lebanon and Jordan”

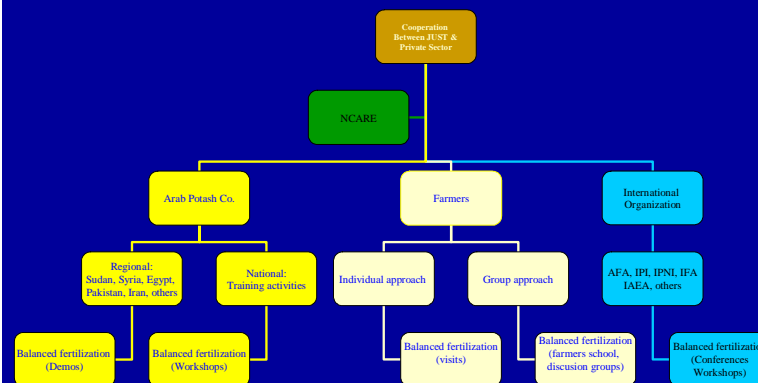
NCARE, Baqa'a, Nov. 22, 2007

Cooperation Between JUST and Private Sector



Prof. Munir Rusan
 Jordan University of Science and Technology
 P.O. Box 3030, Irbid – Jordan
mrusan@just.edu.jo

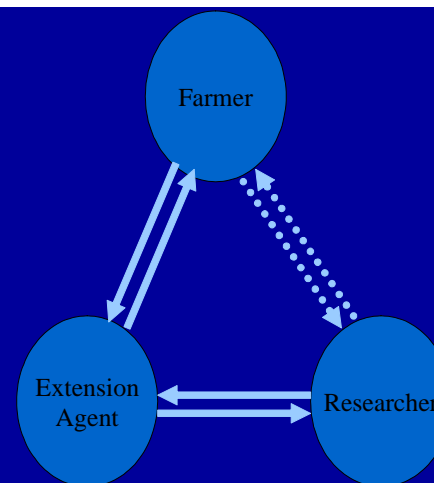
Cooperation Between JUST and Private sector



Tools adopted

- Surveys/needs assessments & Monitoring/progress indicators
- Results demonstration (On-research / on-farm trials)
- On-farm demo, based on participatory approach
- Field Farmer's day
- Skills training
- Extension materials (brochures, leaflets, fact sheets, posters etc)
- Press media (TV, Radio, Newspapers)
- Conferences and workshops
- Open on-line communications

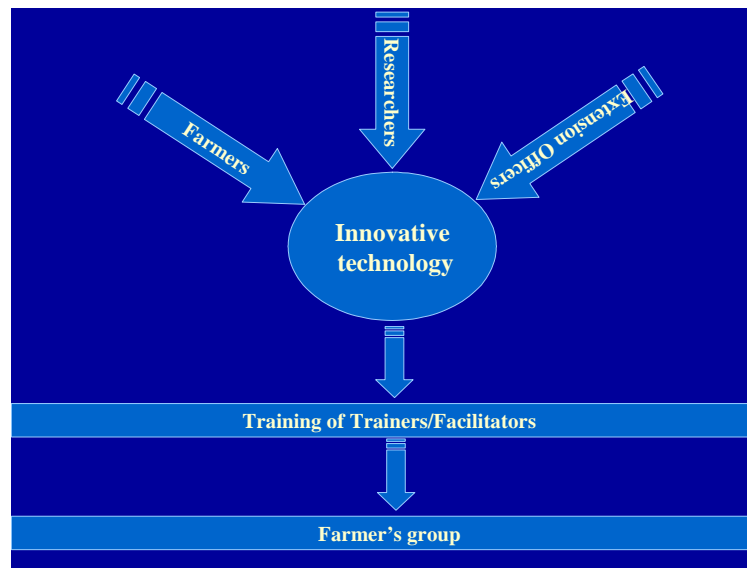
Tech. transfer should be delivered based on trust building and fact based advices to the end users/farmers, extension agents or officers and decision and policy makers



Surveys, Needs assessments, Technology/Knowledge transfer

**Questionnaire survey
Needs assessment**

**Questionnaire
Progress indicator**



**Example of an
Extension Activity to Promote Fertigation:**

Developing a Project on Transferring Appropriate Fertigation Technology to Jordanian Farmers of Vegetables and Cut-Flowers

Status of Fertigation in Jordan:

SURVEY in 2003: 87% of farmers used fertigation and 13% used broadcasting.

Methods of fertilization application in Jordan (2004):

Methods of fertilizer application:	%
By-pass – Fertigation	33
Motor – Fertigation	39
Injector – Fertigation	15
Broadcasting – Soil application	13

WORK PLAN / METHODOLOGY

- * Contract was signed with farmers to jointly implement the demonstration in their fields according to the following conditions:
 1. Researchers and extension agents install the innovative fertilization technology. Then fertilizers are added as recommended by soil test analysis using the injection system
 2. On another part of the farmers field, the farmers use their own traditional fertilization practices
 3. Crops:
 1. Cucumber-protected agric., Kamal Al-Gzawi, JV
 2. Cut flowers, Yahya Wasfi, Baqaa
 4. Monitor and conduct comparison during the season and at harvest, considering agronomical, economical and quality parameters
 1. Field visits, farmers-field-day
 2. On-farm training
 3. Document all practices performed

Comparisons between farmer's practice and innovative technology

Cucumber grower

Treatments	Water (M3/house)	K ₂ O	P ₂ O ₅	N
Farmer,s practice (kg.house)	116	18.9	4.7	7.3
Innovative tech (kg.house)	67	3.4	3.8	2.1
Saving	50%	82%	14%	71%

Cut flowers grower

Treatments	Water (M3/house)	K ₂ O	P ₂ O ₅	N
Farmer,s practice (kg.house)	-	3.7	1.3	8.5
Innovative tech (kg.house)	-	2.2	0.7	1.4
Saving	-	42%	47%	84%

Four training workshops were conducted in different locations with different farmers

Several field days were organized for farmers and agric engineers

Media: Five talks on Radio station, several articles, announcements in the local press

Extension materials: brochures, leaflets, posters etc

Brochures



Building and adapted strategy for
extension service

Fertigation transfer

NCARE Study

Said El- Zuraiqi

22/11/2007

Specific objectives:

- Optimize crop water and fertilizer use efficiencies.
- Improve skills of farmers on fertigation technique.
- Improve skills of extensions agent on fertigation technique.
- To increase the farmers income.

■ Duration:

- 1998-2001

■ Location:

- Jordan valley.
- Al-Mafraq area.
- AL-Shoubak area.

Extension methods used:

■ Extension agents

- lectures
- field training
- field days

■ Farmers:

- Field training
- On farm trials and Demonstrations
- Field days

Technologies introduced:

- Dosatron injectors
- Venture
- water pump

Results

- **Demonstrations 16**
 - field days 4 days
- **Workshops training 2**
- **Training on the farmers farm**
 - Agriculture engineering 44
 - Farmers 71

Conclusions & Recommendations

- It is need to more information and specific calculations.
- Most of the farmers does not present on their farms.
- High cost of injectors
- Above problems must be considered in the technology transfer projects.
- Continuous evaluation for these technique projects will be improved the adaptation process.

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Improvement of Irrigation Water Management in Lebanon & Jordan

Workshop

Building an Adapted Strategy for Extension Service: Case Study on Integrated Fertilization promotion


APREL

Example of a French Experimentation and Extension Services

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What is APREL ?



1. Applied Research centre for vegetables production in South East of France (PACA departments)



CARTE DE LA FRANCE



LES DEPARTEMENTS DE LA REGION PACA

Alpes Alpes
Provence
Côte d'Azur
Côte d'Azur
Côte d'Azur
Côte d'Azur

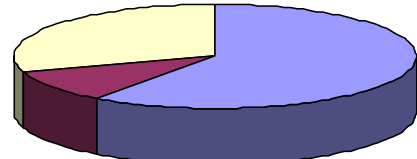
MEDA Water  **Improvement of Irrigation Water Management in Lebanon & Jordan** 

What is APREL ?

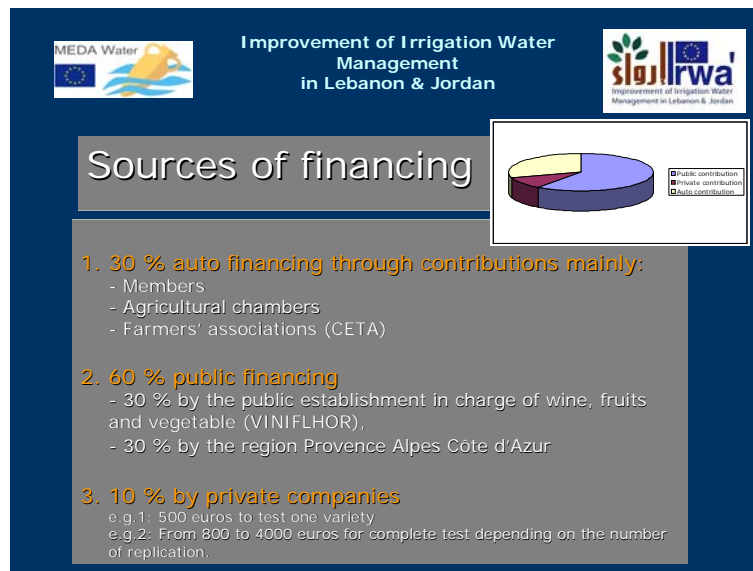
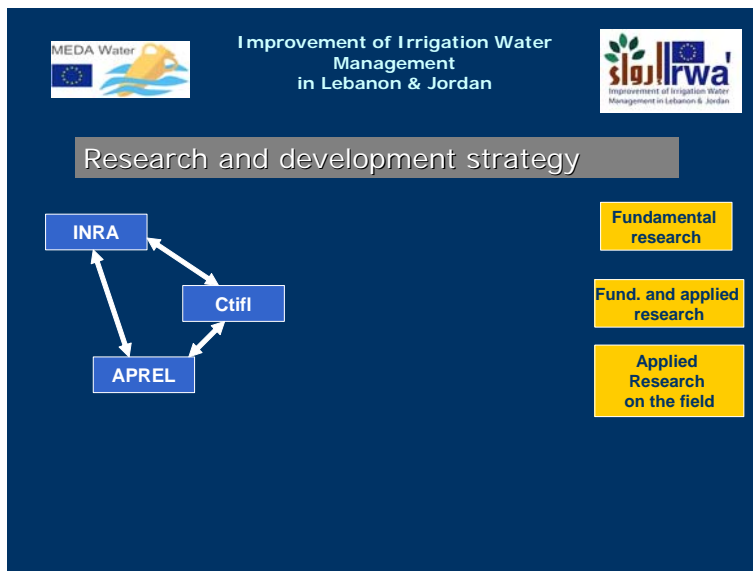
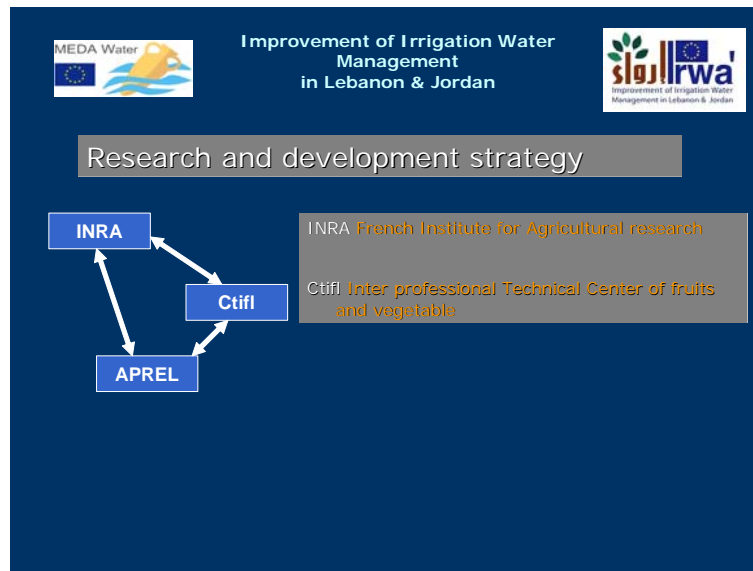
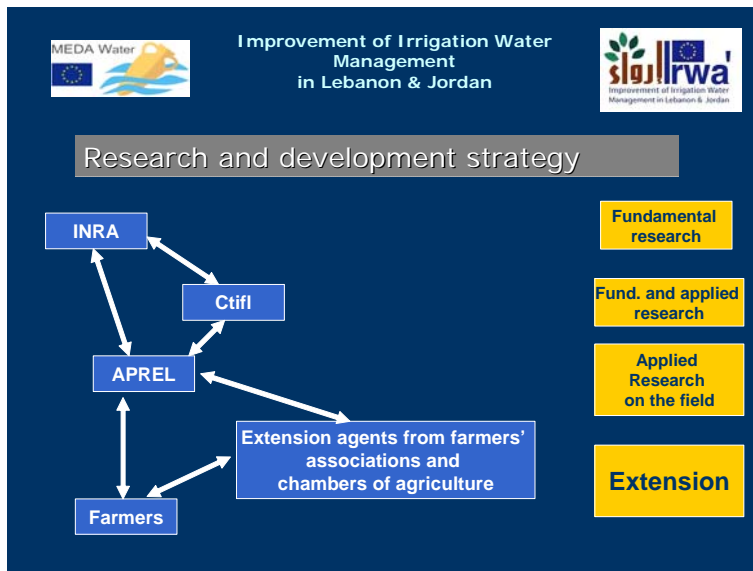
1. Applied Research centre for vegetables production in South East of France (PACA departments)
2. Non Profit Organization created in 1984
3. Experimentations done on farms (no experimentation centre)
4. 4 main topics:
 - Variety screening
 - Integrated management (pest and fertilisation)
 - Soil fertility (cover crops and green manure)
 - Post harvesting and Vegetables' quality testing

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Sources of financing



Public contribution
Private contribution
Auto contribution



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Research and development strategy

Extension

- Technical reports
- Technical sheets
- Field days for producers, extension agents and private companies

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sigorwa
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Research and development strategy

Extension

- At the end of the season, feed back meeting are organized to give the conclusions of each demo plots
- Regular meetings per crops are organized with all the producers to expose the major evolutions

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sigorwa
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An applied research strategy based on a bottom-up approach

Step 1

Farmers

Identification of technical problems

Extension agents from farmers' associations and chambers of agriculture

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sigorwa
Improvement of Irrigation Water Management in Lebanon & Jordan

An applied research strategy based on a bottom up approach

Step 2

Farmers

Trials Planning

APREL

Extension agents from farmers' associations and chambers of agriculture

Scientific support


INRA

Ctifl

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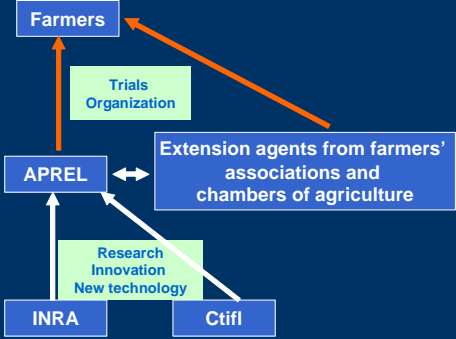
Concrete actions

1. 97 plots in 2007 (48 varieties screening and 49 technical plots)
2. Technical reports
 - varieties choice per species
 - crop protection per species
 - soil fertility: green manure management (5 000 sheets)
 - use of soil NITRATEST

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An applied research strategy based on a bottom up approach

Step 4

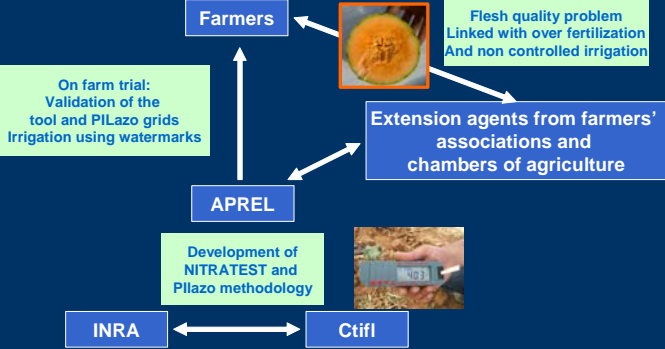


```

graph TD
  INRA --> APREL
  Ctifl --> APREL
  APREL --> Farmers
  APREL <--> ExtAgents[Extension agents from farmers' associations and chambers of agriculture]
  TrialsOrg[Trials Organization] --> Farmers
  ResInnov[Research Innovation New technology] --> APREL
  
```


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E.g: Fruit quality in melon production




```

graph TD
  INRA <--> Ctifl
  Ctifl --> Dev[Development of NITRATEST and Pilazo methodology]
  Dev --> APREL
  APREL --> Farmers
  APREL <--> ExtAgents[Extension agents from farmers' associations and chambers of agriculture]
  ExtAgents --> Farmers
  OnFarm[On farm trial: Validation of the tool and PILazo grids Irrigation using watermarks] --> Farmers
  Farmers --> Problem[Flesh quality problem Linked with over fertilization And non controlled irrigation]
  
```

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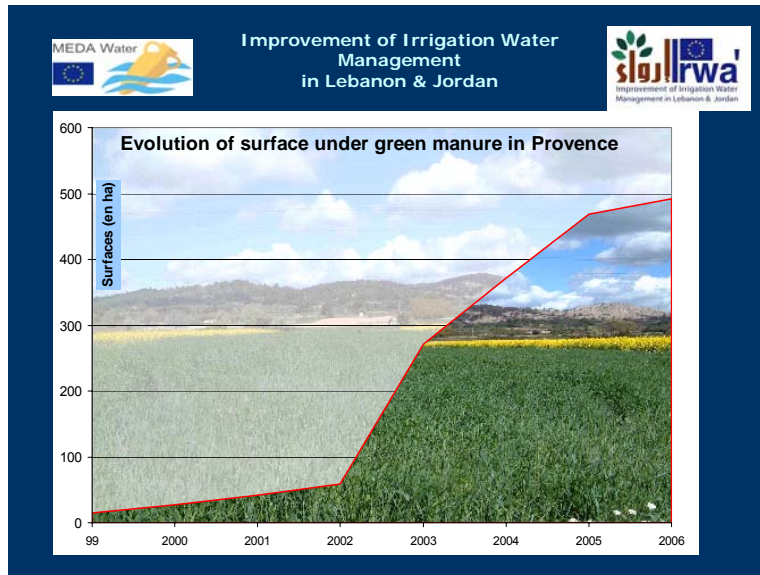
An applied research strategy based on a bottom up approach

Step 3



```

graph TD
  Farmers --> Trials[Trials Approval]
  Trials --> APREL
  APREL <--> ExtAgents[Extension agents from farmers' associations and chambers of agriculture]
  
```



- MEDA Water
Improvement of Irrigation Water Management in Lebanon & Jordan
- sigallrwa
Improvement of Irrigation Water Management in Lebanon & Jordan
- ## Recommendations
1. Strengthen exchanges between extension services and farmers through regular technical meetings and field visits
 2. Develop applied research strategy based on farmers' technical needs.
 3. Reinforce the role of farmers in decision making in the planning and implementation of experimentations.
 4. Redaction of technical sheets, reports and field visits during the cropping season to show the first results.

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Thank you

ANNEX 2: LIST OF PARTICIPANTS

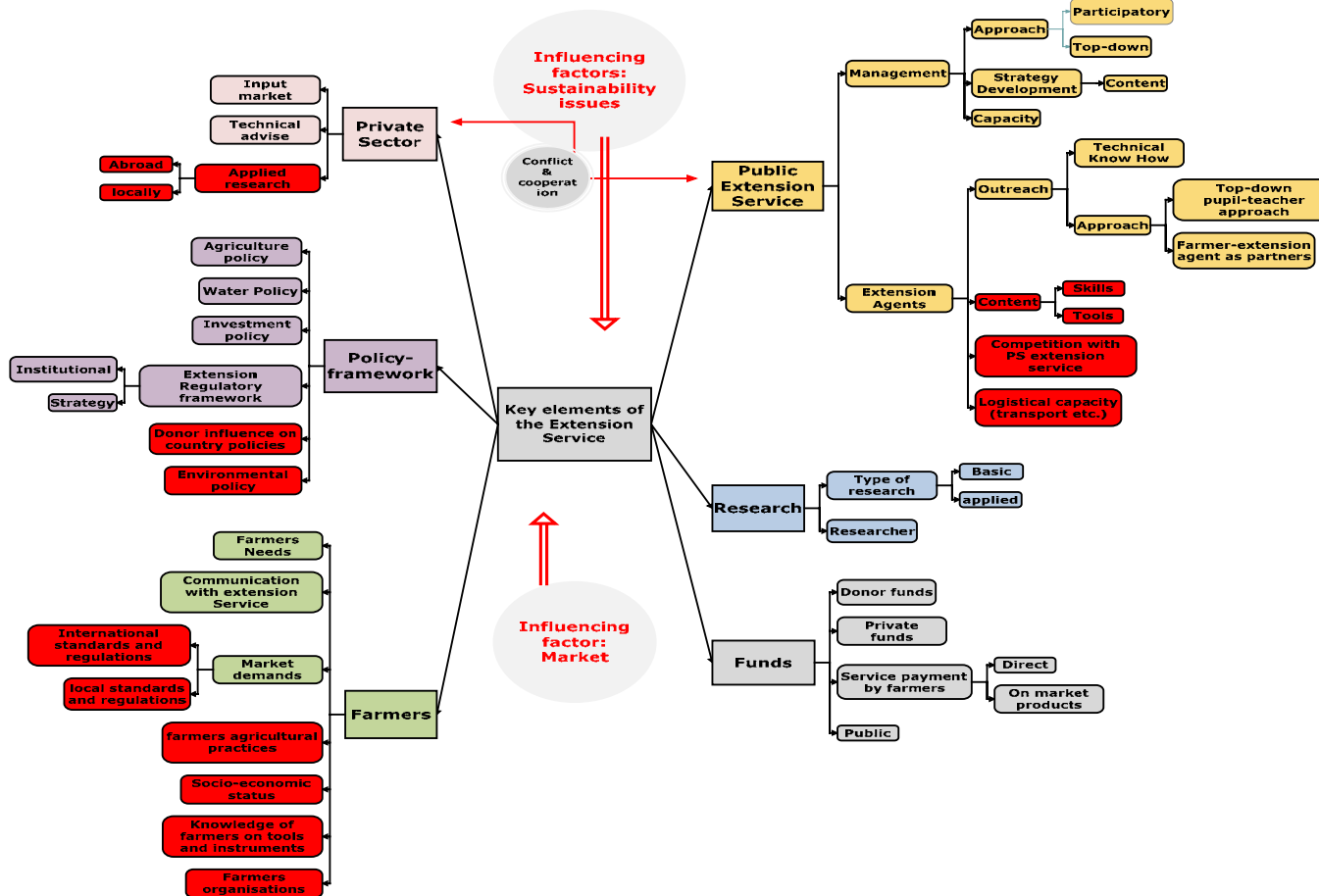
List of Participants

	Organization	Full Name	Position
1	NCARE	Dr. Sameer Khalifeh	Deputy DG
2	NCARE	Dr. Majid Zubi	Ass DG/ Reserch
3	NCARE	Dr. Walid Qawasmeh	Fertigation Specialist
4	NCARE	Dr. Muen Quarryuti	Irrigated Agriculture Progr
5	NCARE	Dr. M Dabbas	Water and Env Progr
6	NCARE	Eng. Haitham Hamdan	Horticultural Researcher
7.	IrWa - Jor	Dr. Esmat Karadsheh	IRWA National Coordinator
87.	IrWa - Jor	Mariateresa Calabrese	IRWA Project Manager
9.	IrWa - Jor	Adrien Peyre	IRWA Agricultural Expert
10.	IrWa - Leb	Renata Raad	
11.	IrWa - Leb	Mohamed or Maher	
12.	Ministry of Agriculture	Najah Masslha	Extensionist
13.	Ministry of Agriculture	Nemeh Owies	Extensionist
14.	JUST	Dr. Munir Russan	Dean, Faculty of Agriculture
15.	Alqawafel company	Eng Sufian Al Bees	R &D manager
16.	Gtz	Eng Sameer Abu Jaber	
17.	Gtz	Eng Ahmed Subh	
18.	Gtz	Eng Anwar Aladwan	Group Advisor
19.	French Embassy (MREA)	Guillaume Panzani	Agricultural Expert
20.	MIRRA	Eng Nour Habjouka	Head of Agriculture and Producers Associations support Unit

21.	MIRRA	Eng Haidar Malhas	Head of Irrigation Unit
22.	Consultant for MIRRA	Chantal Demilecamps	Consultant
23.	APREL	Jean Michel Crestin	Specialist in fertilization
24.	RMSU	Gert Soer	
25.	Farmer	Eng Ali Massadeh	
26.	NCARE	Eng. Ahed Qudah	Extension Agent
27.	NCARE	Eng. Yosuf Smadi	Extension Agent
28.	NCARE	Eng. Bashar Daood	Extension Agent
29.	NCARE	Eng. Mohmad Hamour	Extension Agent

ANNEX 3: MIND-MAP (AS REVISED BY THE WORKSHOP)

Key Elements of an Extension Service: An analytical tool



* Additions made by participants during the workshop are marked in RED

MEDA Water



Workshop

Building an Adapted Strategy for Extension Service: Case Study on Integrated Fertilization Promotion





Improvement of Irrigation Water Management in Lebanon & Jordan



Jordan Valley:

Since the 70th : Introduction of modern production technology

- Specialization of laborers
- Introduction of green house production
- Development of drip irrigation
- Development of fertigation techniques

Switch from traditional to modern production





Improvement of Irrigation Water Management in Lebanon & Jordan



Public Extension Service Availability

1. 1985: Creation of NCARTT



3. From 1985 To 2006 : Extension service provided by NCARTT and MoA

4. 2007 Creation of NCARE: Centralization of services for farmers

Support from international cooperation: GTZ, MREA, EU, USAID, JICA...



Improvement of Irrigation Water Management in Lebanon & Jordan



Main constraints regarding fertilization

- ❑ **Improper fertilization management by farmers**
 1. **Application of fertilization depending on farmers experience**
 2. **Few farmers refer to soil and water analysis**
 3. **Improper injection procedure**

- ❑ Utilization of mixed treated water

- ❑ Little pressure from consumers for safety food production

- ❑ Absence of control bodies to check for G.A.P

- ❑ The private sector remains the main provider of T.A.



Improvement of Irrigation Water Management in Lebanon & Jordan



Problems

Excess of fertilizer used
High environmental impact
Increase of production cost

**NEED TO IMPROVE SERVICES FOR
FARMERS**



Improvement of Irrigation Water Management in Lebanon & Jordan



**Aim of the workshop:
identify strategies for implementing
efficient extension services.**

1. Presentation of the existing strategies developed to promote integrated fertilization practices in the region (guest speakers from: MREA/MIRRA, GTZ, NCARE, JUST University)
2. Case study of extension services strategy developed by APREL, a French applied research centre.
3. Group discussion to revise the needs and conditions for proper extension services in Jordan



Improvement of Irrigation Water Management in Lebanon & Jordan



KEY QUESTION:

What could be done by each actor to improve the performance of the extension system?

Water Management in Irrigated Agriculture- WMIA, Reclaimed Water Component

Extension Approach



Overview

- The project aims at ensuring that farmers using reclaimed water for irrigation are using it safely and efficiently.
- There are 3000 farm units (about 1500 farmers) in the project area irrigated by reclaimed water.
- Reclaimed water contain significant amount of nutrients that should be considered in fertigation program.
- During the past 3 years demonstration trials and intensive farms monitoring conducted by the project revealed that farmers using reclaimed water for irrigation can save up to 60% of the fertilization cost.
- Estimation showed that farmers in the middle Jordan Valley (DA 22 to DA 28) spend JD 7.5 million per season and JD 1.5 millions could be saved if 30% of farmers adopted project recommendations

Extension Tools

- Guidelines for the use of reclaimed water both in Arabic and English language
- Fertigation Excel sheets: calculate nutrients and water requirement (information appropriate for farmers)

Approach

- How to reach farmers ?
- Our target is to reach 1000 farmers and ensure that 500 implement the recommendations.
- The project in collaboration with JVA and MoA disseminate the fertigation recommendations through
 - 1- Field days
 - 2- Workshops
 - 3- Training of Trainers (JVA and MoA staff)
 - 4- Farmers training campaign

Farmers' training campaign

- 1000 farmers will be trained in the coming 2 seasons on the topic of fertigation.
- Intensive training campaign for farmers by MoA, and project staff (each session 1-2 hours for 15-20 farmers).
- Farmers get fertigation sheets for different crops.

Outcome

- Up till this moment 250 farmers were trained in the southern region of the project area.
- Farmers showed high interest and good response to the topic.
- The approach promotes the interaction and coordination between JVA, MoA and the project.

Vision: Irrigation water information service

Problems

- **Technical:** Farmers are fertilizer-oriented
- **Behavioral:** During high prices periods farmers tends to over fertilize their crops and forget what they have learned
- **Institutional:**
 1. Institutional commitment
 2. Limitation in the staff
 3. Farmers follow up

A pilot project 2001 - 2007:
*“Support to the Fruits &
Vegetables Commodity System.”*

Highlighting the fertilisation component
of technical assistance.

Nour Habjoka, MIRRA.
November 2007

Project presentation

- The Regional Mission for Water & Agriculture – The French Embassy, in Jordan and NCARE – The Ministry of Agriculture.



- Objectives:
 - Testing the possibility of substituting traditional cropping pattern by a high added-value crop.
 - Benefit small- and medium-scale producers.
- A market-oriented approach, providing technical assistance to an organised group of producers for one specific crop.



Methodology

- Weekly follow-up by field engineer
 - Holistic view,
 - Since early production stages.
- All recommendations complement each other and are directed towards a clear, ultimate goal:

A high quality produce 
- On-farm implementation & experimentation of techniques (fumigation, fertilisation, etc).



- Exposure to other practices & experiences.
- Charentais melon French expert
 - adapted recommendations,
 - external point of view.
- NCARE active involvement in trials.
- PILazo[®] as basis for fertilisation recommendations and advice.



Tools

- I. Technical guidelines, brochures, and documents adapted to the context.
- II. PILazo[®]

PILazo[®] In principle

- A practical method to monitor & control nitrogen application.
- Highly accurate, on-field measurement of NO³⁻ in soil and plant sap.
- Independent of geographical location and climatic conditions.



PILazo® in practice

a. Before planting
measure NO³⁻ in soil.



b. After planting
measure NO³⁻ in sap, weekly.



1. Sampling
2. Sap extraction
3. Analysis



Result is compared to “grid of decision”
indicating plant comfort with nitrogen levels.

NO ₃ in mg/l																	
> 6500	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
5500 - 6500	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
5000 - 5500	Light Green	Light Green	Light Green	Light Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
4500 - 5000	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
4000 - 4500	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green
3500 - 4000	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
3000 - 3500	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
2500 - 3000	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
2000 - 2500	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
1500 - 2000	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
< 1500	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
weeks after planting	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	
	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	
	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	
	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	

nitrogen in excess
 nitrogen sufficient: do not fertilize but keep monitoring
 1 - 2 kg/du per week
 2 - 3 kg/du per week
 0.5 - 1 kg/du per week

Results

- Despite varied environments, many farmers were able to produce high quality melons.
- Success in reducing application of nitrogen to zero for a complete Charentais melon season.
- NCARE approachable for producers, offering services that fit the farmers' needs.
- Adoption of PILazo[®] tool by the association.



Main constraints

- Started off with excess nitrogen content in soil, which was difficult to control.
- PILazo® theory was not always easy to explain.
- Costly technical assistance offered by this project.
- Confusion due to private sector interference with advice & recommendations.
- Character & communication skills of technical assistant is a determining factor for capacity to contest with producer.

Conclusions and recommendations

- PILazo[®] is a strong tool, complimentary to other techniques to pilot other elements.
- The need for extensive trainings on PILazo[®] .
- Better coordination & definition of tasks between the different stakeholders, for better utilisation of resources.





Workshop

**Building an Adapted Strategy for
Extension Service: Case Study on
Integrated Fertilization promotion**

IrWa

**Experience in building a pilot
extension service for farmers**





Improvement of Irrigation Water Management in Lebanon & Jordan



IrWa: a regional project (Jordan and Lebanon)

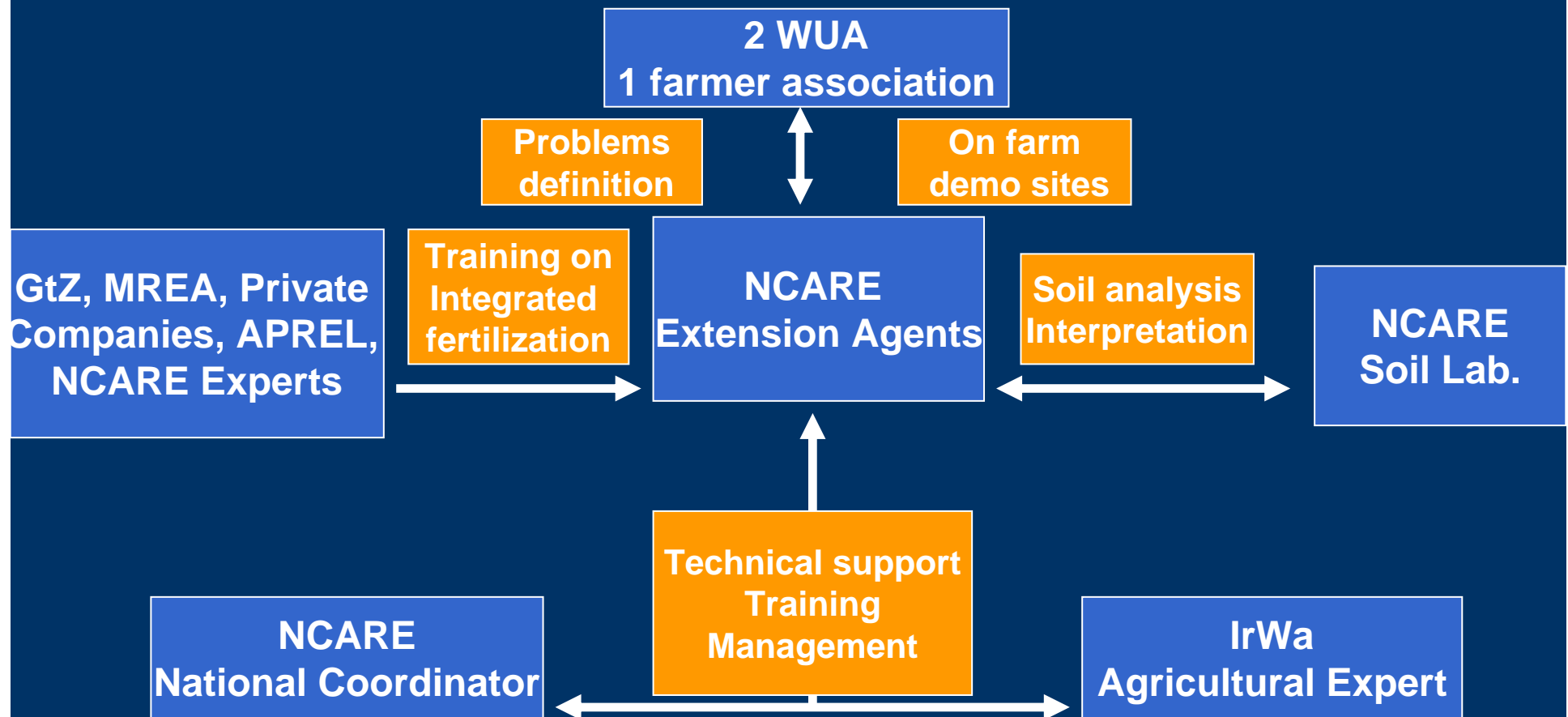
1. Objective: Increasing farmers income by improving crop production and minimizing on-farm inputs and O&M costs
2. Financing: European Union in framework of MEDA program
3. Duration : 2003 - 2008
4. Main topics tackled:
 - On farm optimization of irrigation system
 - Promotion of Integrated management (pest and fertilization)
 - Support to Public Extension Service
 - River bed rehabilitation and management
 - Installation of filtering units at KAC



Improvement of Irrigation Water Management in Lebanon & Jordan



Methodology: Bottom up approach for pilot extension service





Improvement of Irrigation Water Management in Lebanon & Jordan



Tools adopted

1. PILazo: eggplant, tomato, cucumber, pepper
2. GTZ excel sheet
3. Ferti tank and Dosatron

Tools developed

1. Technical sheets
2. IrWa excel sheet to assess farmer fertigation practice
3. Task definition and working procedure for EA
4. Training for farmers





Improvement of Irrigation Water Management in Lebanon & Jordan



Expected Results

1. 7 Extension Agents **trained and working on the field**
2. 7 on farm demo **sites on integrated fertilization (PILazo)**
3. 2 experimentation trials in Deir Allah Centre
 - **Mineralization of different kind of Organic matter**
 - **Closed soil less system**
4. 30 fertigation tanks and Dosatrons **used**
5. 200 Farmers trained **on integrated fertilization practices**



Improvement of Irrigation Water Management in Lebanon & Jordan



Main constraints

1. **Difficult to collect accurate data on the demo site organized on farm**
2. **Difficult to change farmers practices**
 - Some farm owners are not dealing directly with technical issues
 - High turn over of farm staff
3. **High competition with private extension service**
4. **Dosatron not adapted for farmers with low technical know how**
5. **Low Extension Agent availability (only 2 days / week)**
6. **PILazo tools not distributed locally**



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Recommendations

1. Reinforce Extension Agents methodology and communication skills
2. Organize training for permanent laborers
3. Develop/support farmers association to strengthen the bottom-up approach
4. Develop specialized service in NCARE (fertilization, pest management, irrigation, post harvesting)



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Thank you



IrWa Project

Building an Adapted Strategy for Extension Service:
“Case Study in Integrated Fertilization promotion in Lebanon and Jordan”

NCARE, Baqa'a, Nov. 22, 2007

Cooperation Between JUST and Private Sector



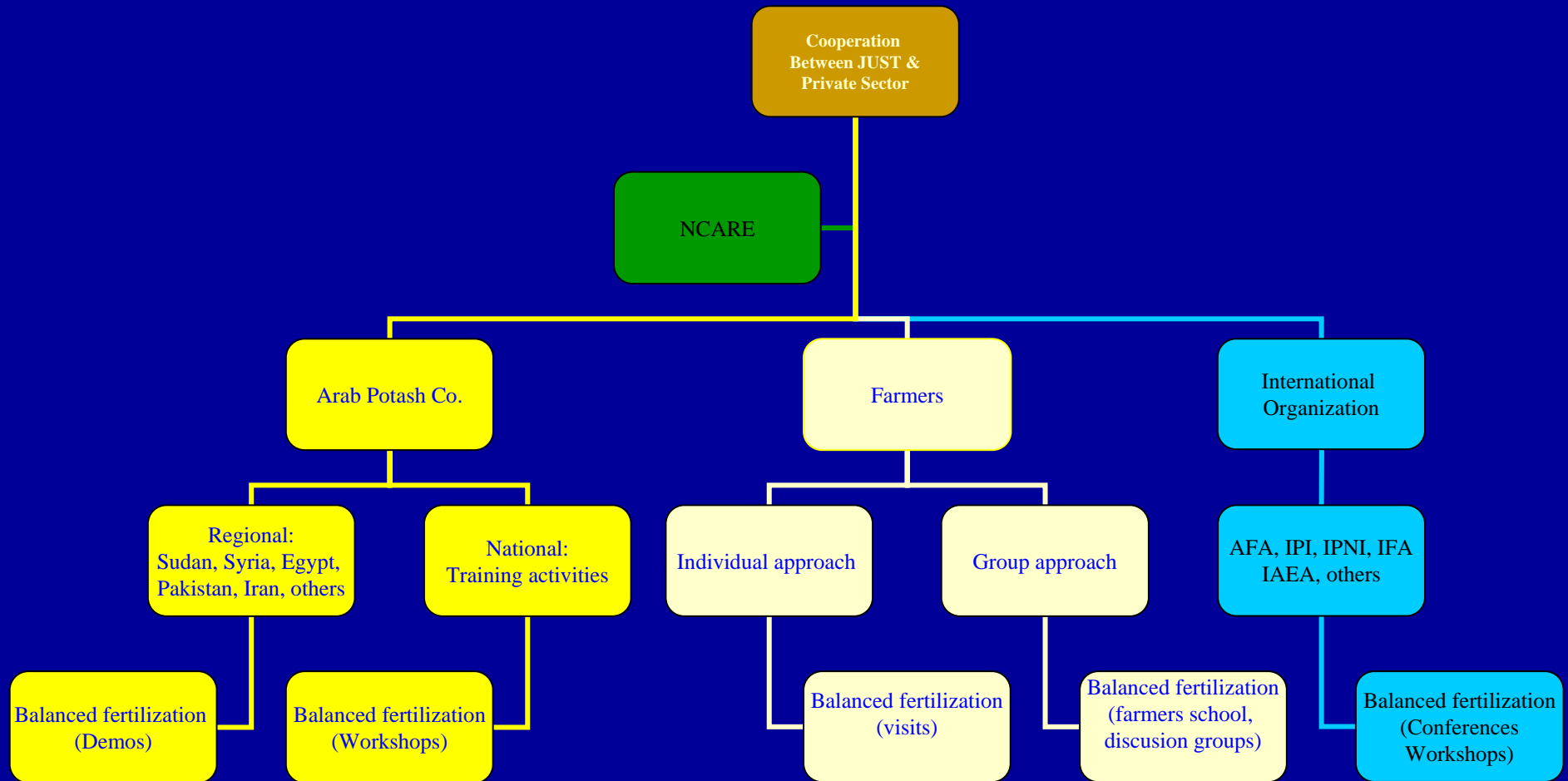
Prof. Munir Rusan

Jordan University of Science and Technology

P.O. Box 3030, Irbid – Jordan

mrusan@just.edu.jo

Cooperation Between JUST and Private sector



Tools adopted

Surveys/needs assessments & Monitoring/progress indicators

Results demonstration (On-research / on-farm trials)

On-farm demo, based on participatory approach

Field Farmer's day

Skills training

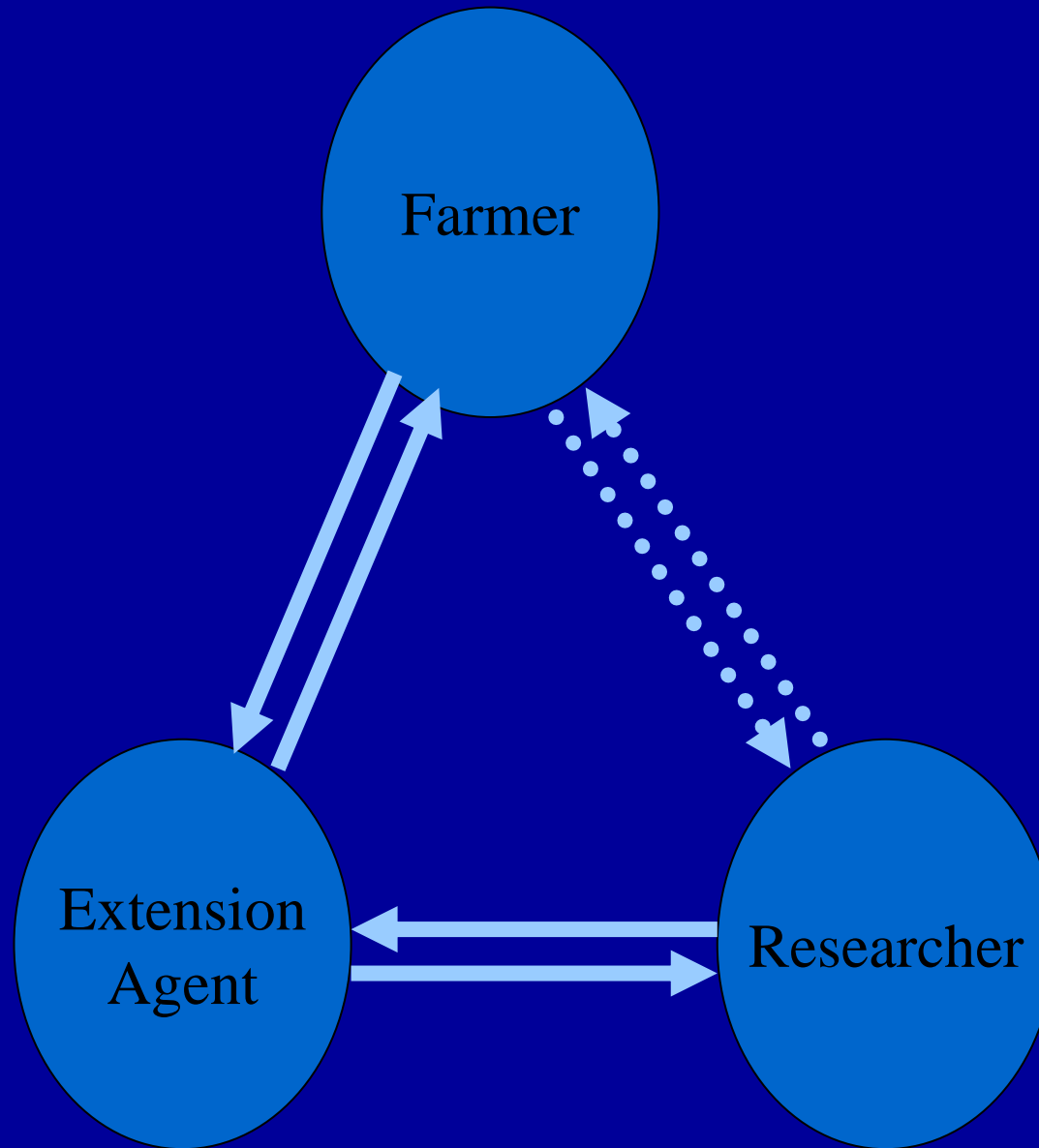
Extension materials (brochures, leaflets, fact sheets, posters etc)

Press media (TV, Radio, Newspapers)

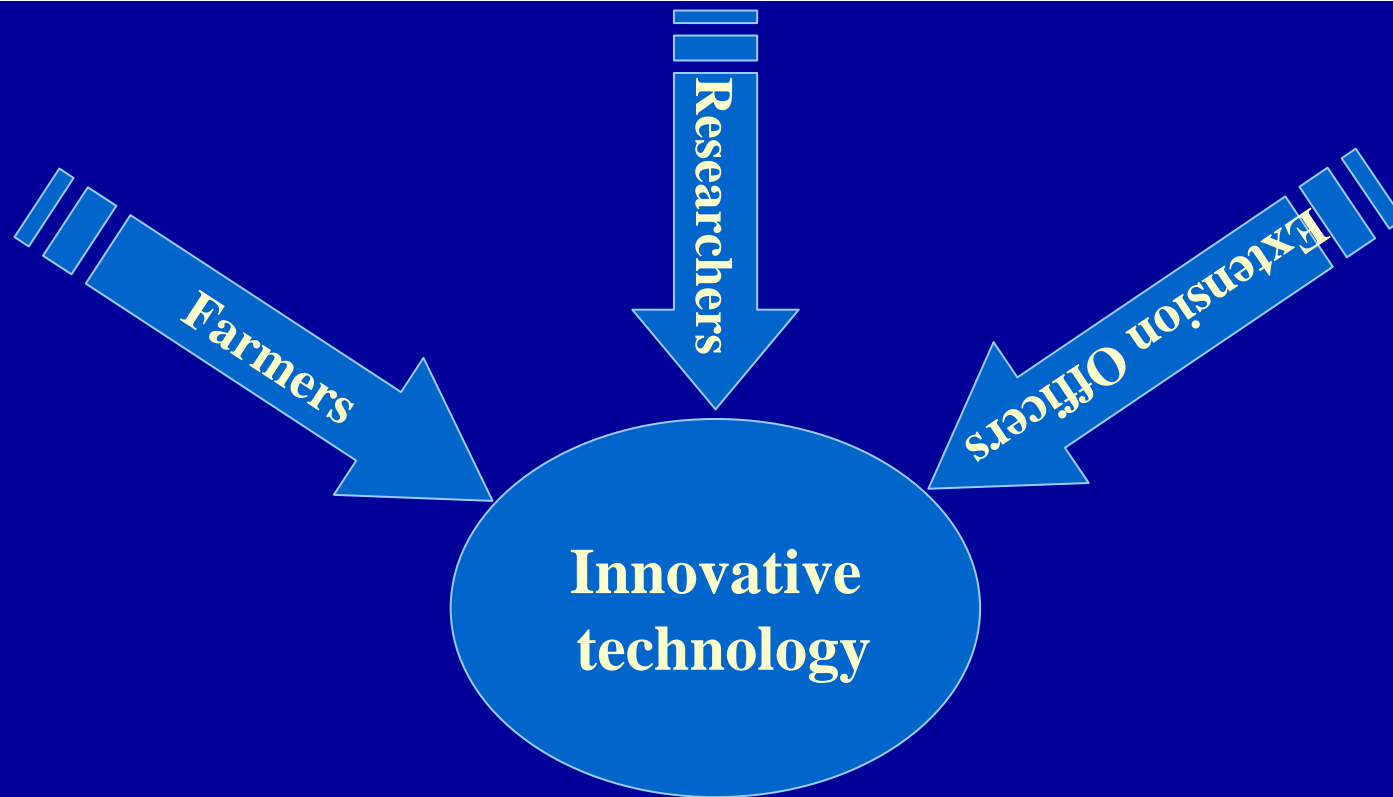
Conferences and workshops

Open on-line communications

Tech. transfer should be delivered based on trust building and fact based advices to the end users/farmers, extension agents or officers and decision and policy makers



Surveys, Needs assessments, Technology/Knowledge transfer



Training of Trainers/Facilitators

Farmer's group

Example of an Extension Activity to Promote Fertigation:

Developing a Project on Transferring Appropriate Fertigation
Technology to Jordanian Farmers of Vegetables and Cut-Flowers

Status of Fertigation in Jordan:

SURVEY in 2003: 87% of farmers used fertigation and 13% used broadcasting.

Methods of fertilization application in Jordan (2004):

Methods of fertilizer application:	%
By-pass – Fertigation	33
Motor – Fertigation	39
Injector – Fertigation	15
Broadcasting – Soil application	13

WORK PLAN / METHODOLOGY

- * Contract was signed with farmers to jointly implement the demonstration in their fields according to the following conditions:
 1. Researchers and extension agents install the innovative fertilization technology. Then fertilizers are added as recommended by soil test analysis using the injection system
 2. On another part of the farmers field, the farmers use their own traditional fertilization practices
 3. Crops:
 1. Cucumber-protected agric., Kamal Al-Gzawi, JV
 2. Cut flowers, Yahya Wasfi, Baqaa
 4. Monitor and conduct comparison during the season and at harvest, considering agronomical, economical and quality parameters
 1. Field visits, farmers-field-day
 2. On-farm training
 3. Document all practices performed

Comparisons between farmer's practice and innovative technology

Cucumber grower

Treatments	Water (M3/house)	K ₂ O	P ₂ O ₅	N
Farmer,s practice (kg.house)	116	18.9	4.7	7.3
Innovative tech (kg.house)	67	3.4	3.8	2.1
Saving	50%	82%	14%	71%

Cut flowers grower

Treatments	Water (M3/house)	K ₂ O	P ₂ O ₅	N
Farmer,s practice (kg.house)	-	3.7	1.3	8.5
Innovative tech (kg.house)	-	2.2	0.7	1.4
Saving	-	42%	47%	84%

Four training workshops were conducted in different locations with different farmers

Several field days were organized for farmers and agric engineers

Media: Five talks on Radio station, several articles, announcements in the local press

Extension materials: brochures, leaflets, posters etc

**Building and adapted strategy for
extension service**

Fertigation transfer

NCARE Study

Said El- Zuraiqi

22/11/2007

Specific objectives:

- Optimize crop water and fertilizer use efficiencies.
- Improve skills of farmers on fertigation technique.
- Improve skills of extensions agent on fertigation technique.
- To increase the farmers income.

- **Duration:**

- 1998-2001

- **Location:**

- Jordan valley.

- Al-Mafraq area.

- AL-Shoubak area.

Extension methods used:

- **Extension agents**
- lectures
- field training
- field days
- **Farmers:**
 - Field training
 - On farm trials and Demonstrations
 - Field days

Technologies introduced:

- Dosatron injectors
- Venture
- water pump

Results

- **Demonstrations 16**
- - **field days 4 days**
- **Workshops training 2**
- **Training on the farmers farm**
 - Agriculture engineering 44
 - Farmers 71

Conclusions & Recommendations

- It is need to more information and specific calculations.
- Most of the farmers does not present on their farms.
- High cost of injectors
- Above problems must be considered in the technology transfer projects.
- Continuous evaluation for these technique projects will be improved the adaptation process.



Workshop

**Building an Adapted Strategy for
Extension Service: Case Study on
Integrated Fertilization promotion**

APREL

**Example of a French Experimentation
and Extension Services**



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What is APREL ?

1. Applied Research centre for vegetables production in South East of France (PACA departments)





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What is APREL ?

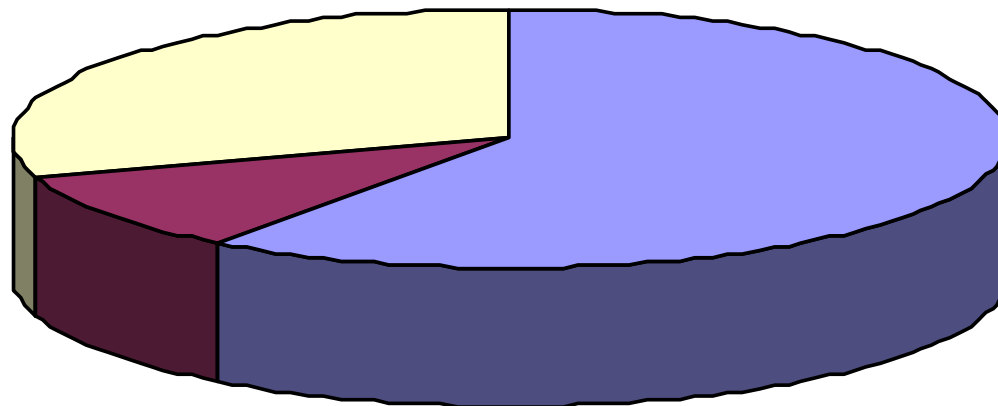
1. Applied Research centre for vegetables production in South East of France (PACA departments)
2. Non Profit Organization created in 1984
3. Experimentations done on farms (no experimentation centre)
4. 4 main topics:
 - Variety screening
 - Integrated management (pest and fertilisation)
 - Soil fertility (cover crops and green manure)
 - Post harvesting and Vegetables' quality testing



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Sources of financing



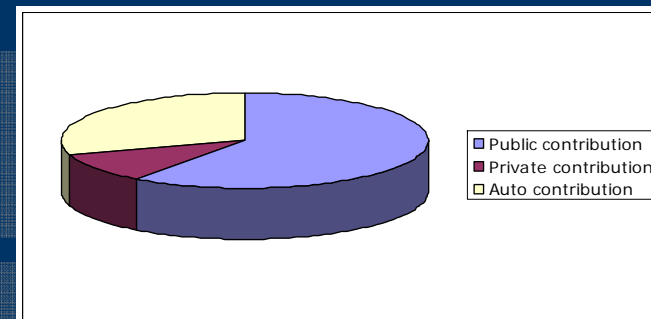
- Public contribution
- Private contribution
- Auto contribution



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Sources of financing



1. 30 % auto financing through contributions mainly:

- Members
- Agricultural chambers
- Farmers' associations (CETA)

2. 60 % public financing

- 30 % by the public establishment in charge of wine, fruits and vegetable (VINIFLHOR),
- 30 % by the region Provence Alpes Côte d'Azur

3. 10 % by private companies

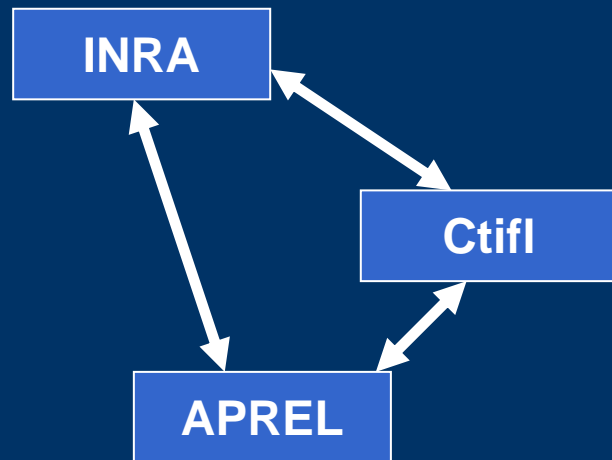
- e.g.1: 500 euros to test one variety
- e.g.2: From 800 to 4000 euros for complete test depending on the number of replication.



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Research and development strategy



INRA French Institute for Agricultural research

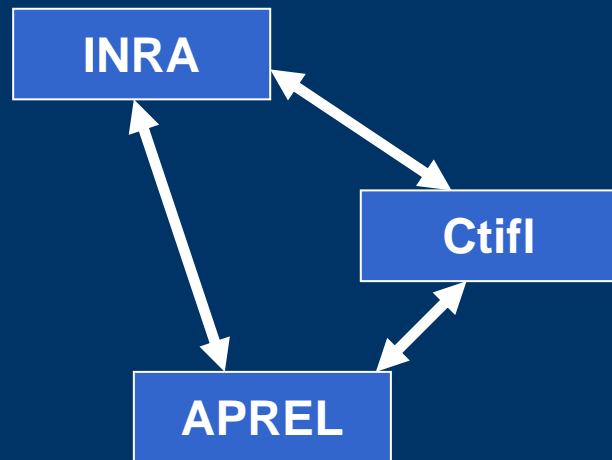
Ctifl Inter professional Technical Center of fruits and vegetable



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Research and development strategy



**Fundamental
research**

**Fund. and applied
research**

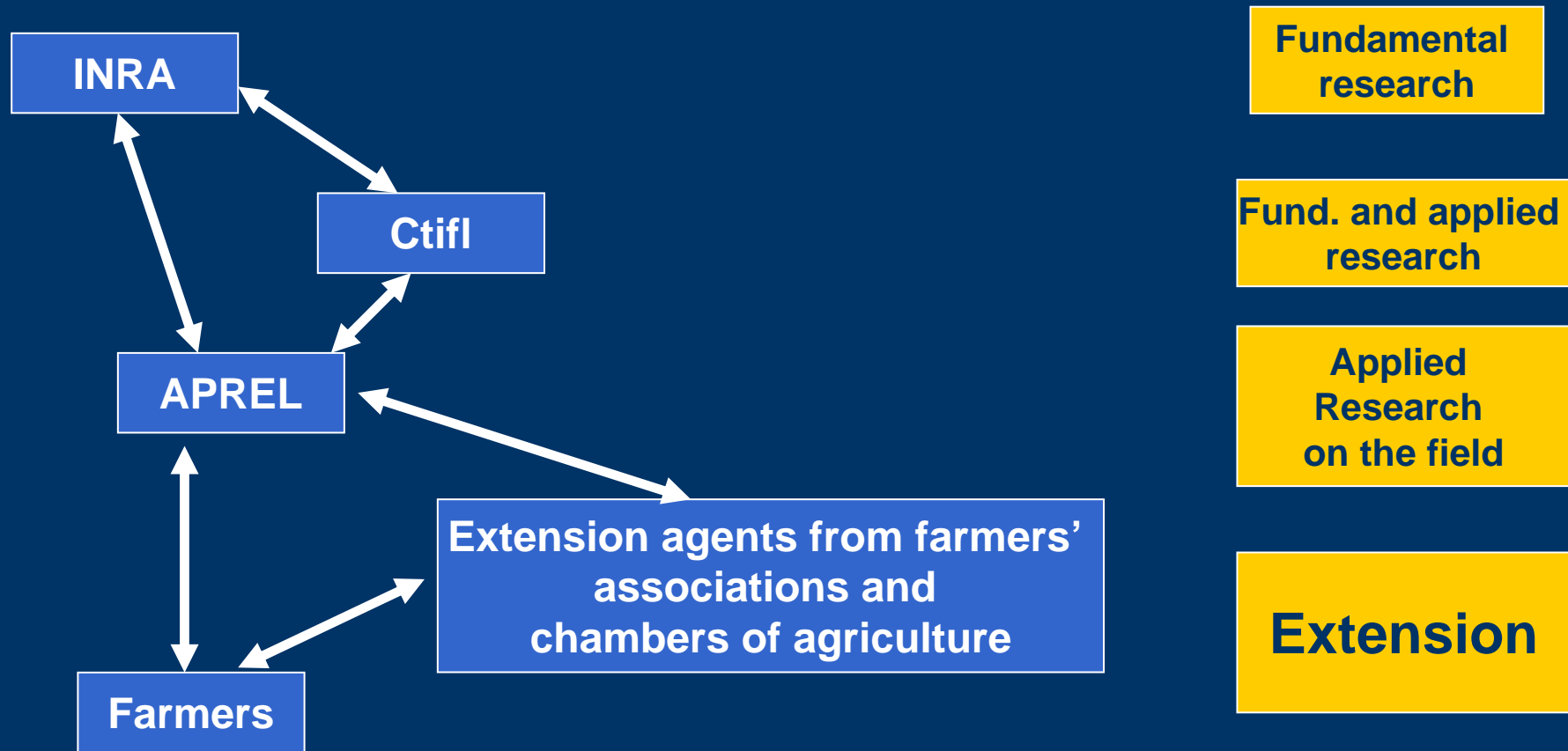
**Applied
Research
on the field**



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Research and development strategy





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Research and development strategy

Extension

- Technical reports
- Technical sheets
- Field days for producers, extension agents and private companies



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Research and development strategy

Extension

- At the end of the season, feed back meeting are organized to give the conclusions of each demo plots
- Regular meetings per crops are organized with all the producers to expose the major evolutions



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An applied research strategy based on a bottom-up approach

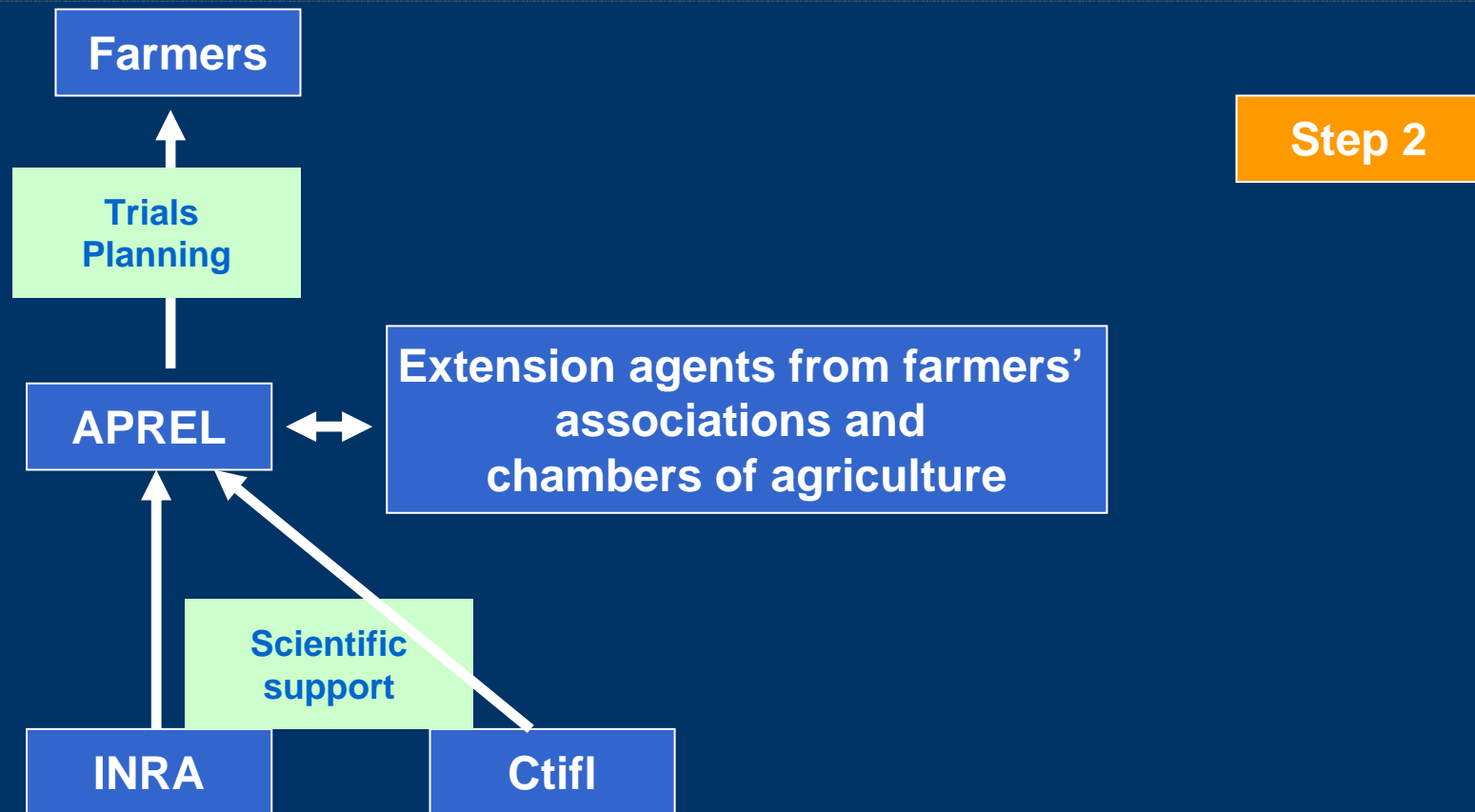




Improvement of Irrigation Water Management in Lebanon & Jordan



An applied research strategy based on a bottom up approach





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An applied research strategy based on a bottom up approach

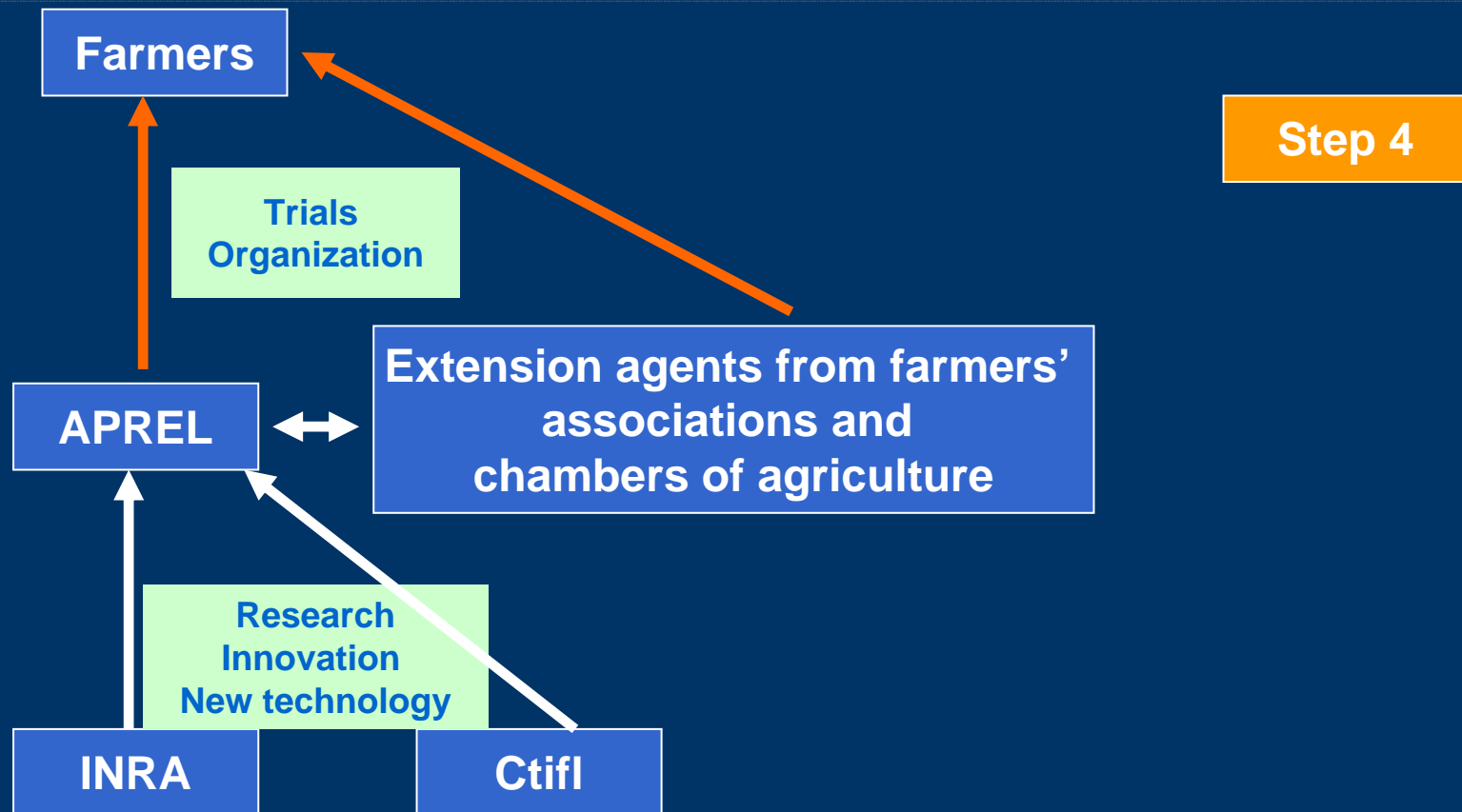




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An applied research strategy based on a bottom up approach

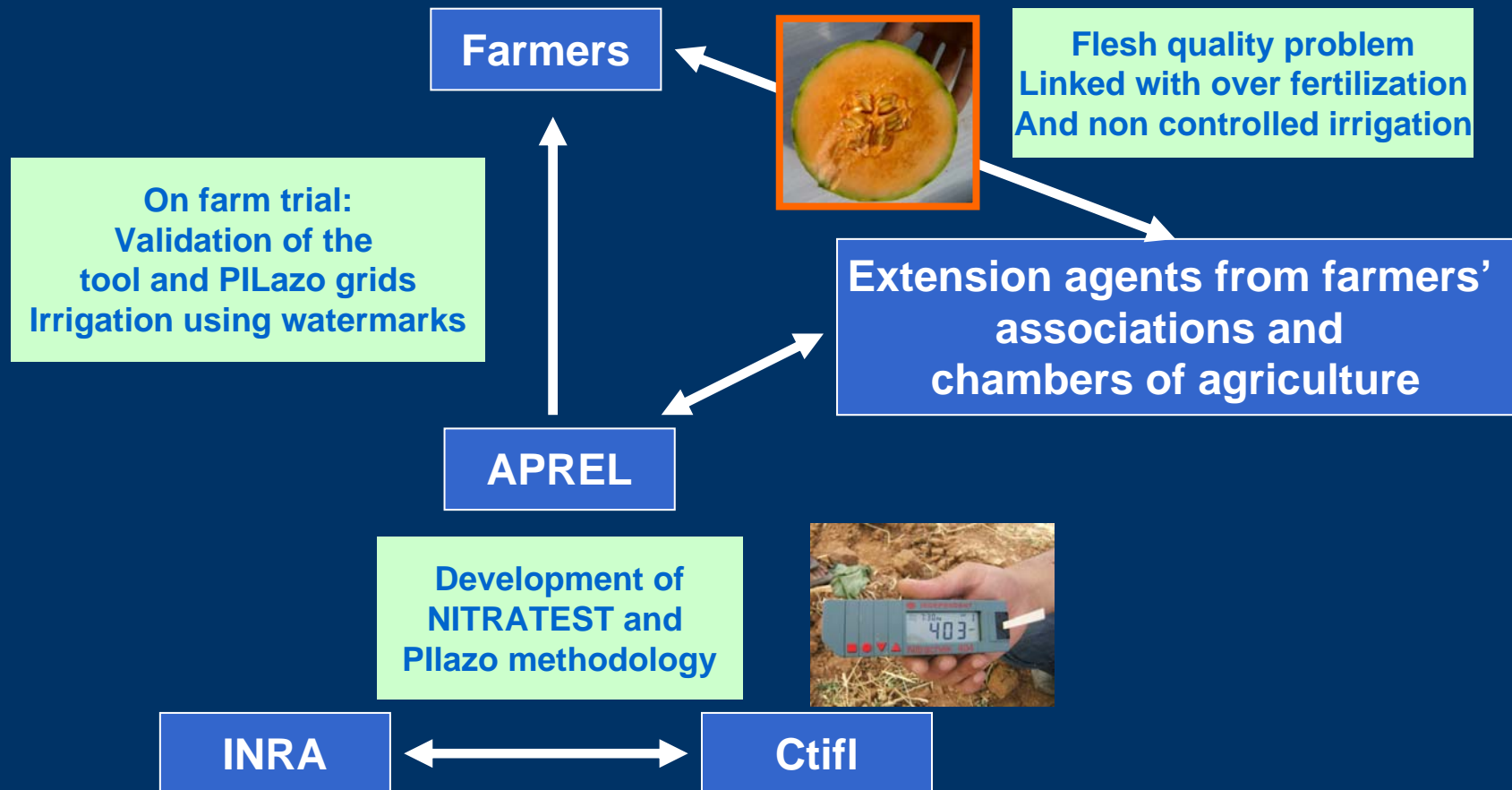




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E.g: Fruit quality in melon production





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Concrete actions

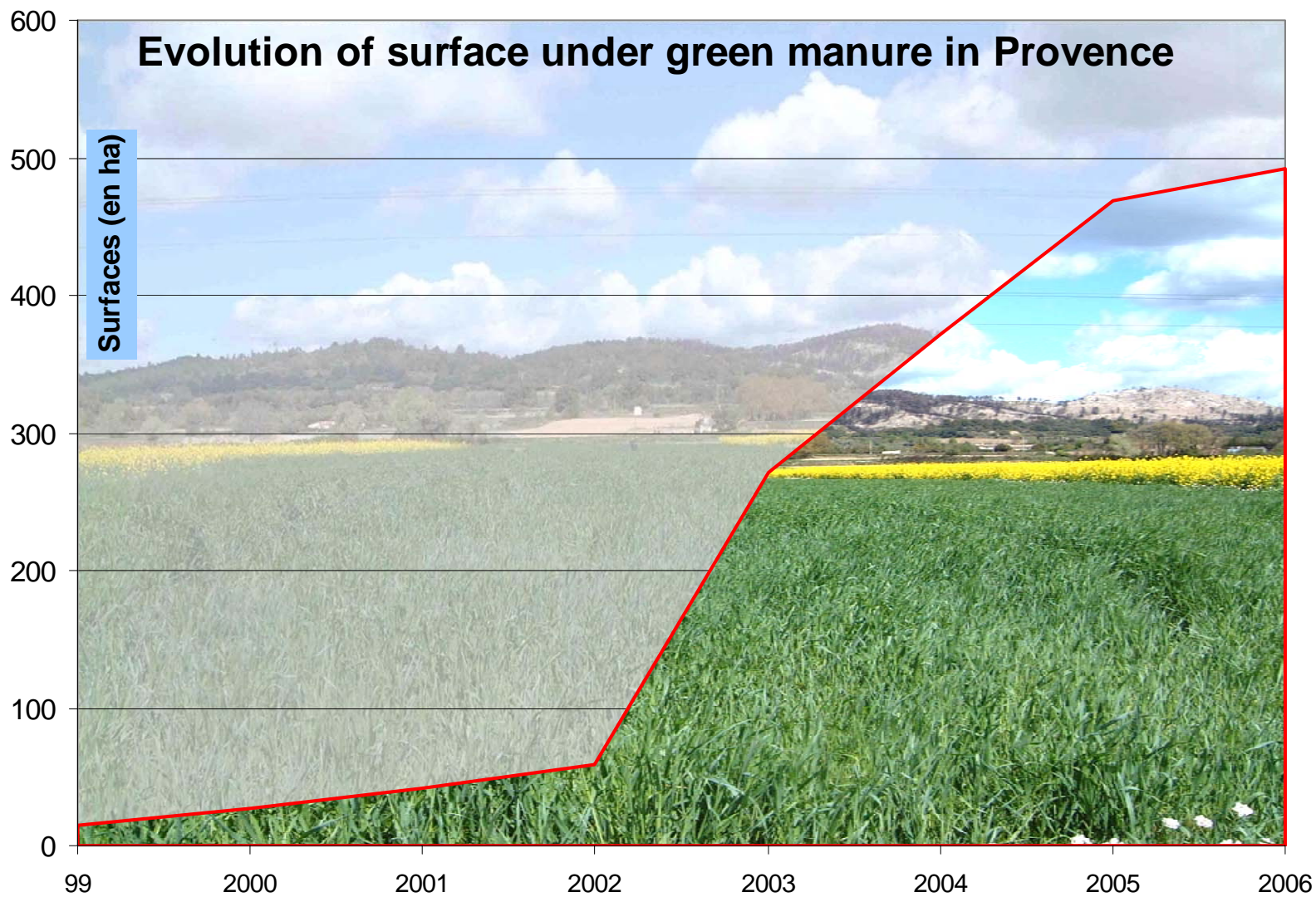
1. **97 plots in 2007** (48 varieties screening and 49 technical plots)

2. Technical reports

- varieties choice per species
- crop protection per species
- soil fertility: green manure management (5 000 sheets)
- use of soil NITRATEST



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Improvement of Irrigation Water Management in Lebanon & Jordan



Recommendations

1. Strengthen exchanges **between extension services and farmers through regular technical meetings and field visits**
2. **Develop** applied research **strategy based on farmers' technical needs.**
3. **Reinforce the** role of farmers in decision making **in the planning and implementation of experimentations.**
4. **Redaction of technical sheets, reports and field visits during the cropping season to show the first results.**



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Thank you

MEDA Water



Workshop

Building an Adapted Strategy for Extension Service: Case Study on Integrated Fertilization Promotion





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**Aim of the workshop:
identify strategies for implementing
efficient extension services.**

1. Presentation of the existing strategies developed to promote integrated fertilization practices in the region (guest speakers: MREA/MIRRA, GTZ, NCARE, JUST University)
2. Case study of extension services strategy developed by APREL, a French applied research centre.
3. Group discussion to revise the needs and conditions for proper extension services in Jordan



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KEY QUESTION:

What could be done by each actor to improve the performance of the extension system?

4 discussion groups:

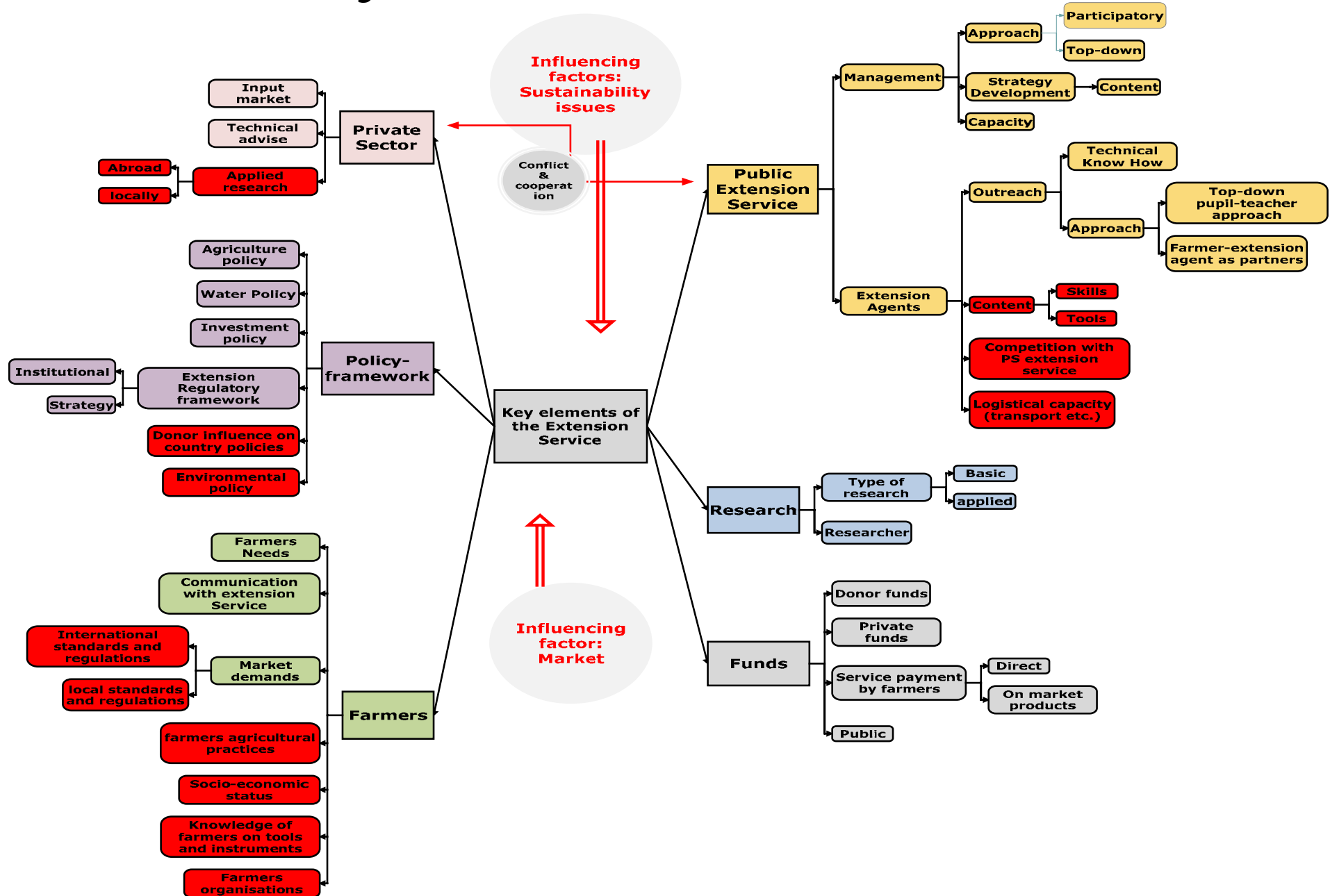
Farmers

Donors/NGO

Extension service/private sector

Research/University

Key Elements of an Extension Service





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Major constrains

From farmers group:

- Poor extension agent technical and communication skills
- Lack of logistic facilities
- Low investment means from poor farmers
- Difference in education level within farmers' groups
- Low farmer participation in decision making
- Weak or lack of farmers' organization



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Major constrains

From extension group:

- Improper working conditions (lack of transport, means, incentives, routine work)
- Absence of management strategy and working procedures
- Lack of specialized/qualify field engineers
- Important staff turnover
- Lack of communication/connection between public and private sector
- Difficult to find the right person to approach on the farm



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Major constrains

From research and university group:

- Lack of applied research and practical training
- Lack of links between academic institution and field problematic
- Lack of collaboration among local institution
- Hard bureaucracy procedures



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Major constrains

From donors and NGO group:

- Starting projects takes too long
- Lack of available professional staff and means
- Scarce flow of information
- Lack of trust by farmers
- Conflict of interest between donors
- Lack of continuity in providing services



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6 levels of recommendations

- Institutional
- Technical
- Methodological
- Human resources policy
- Networking
- Financial sustainability



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Recommendations

Institutional

Build a proper framework
Develop a clear and stable mandate

Technical

Create specialized services
(fertilization, irrigation, pest management, post harvesting)
E.A capacity building and technical skills
(use of practical tools, communication skills)

Methodological

Promote bottom up approach
(farmers' focus group)
Market and quality oriented



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Recommendations

Human resource Policy

Tight relationship farmers/extension agents
**Create clear job description and
working procedure**
Career development planning

Networking

Twin institution in Europe
**Tight relation ship with private sectors
and universities**

Financial Sustainability

Increase support from private sector
Include financial participation from farmers