"Strengthening regional capacity for irrigation revitalization and agriculture water governance: a capacity development agenda for Asia and Pacific "

Regional WORKSHOP
4 to 6 March 2013

WORKSHOP REPORT

Contents

Background

Irrigated agriculture is essential to the achievement of human development and environmental targets in the Asia Pacific. But in transforming economies, the agriculture and irrigation sectors will need to become more innovative, adaptative and forward-looking. In that context capacities need to be continuously updated.

Revitalizing Irrigation and Agricultural Water Governance in Asia Pacific (this Initiative launched by FAO and IWMI) build on the existing capacity of the various actors of the agriculture and water sectors in the Asia Pacific region so that it can move towards greater food security, poverty alleviation, environmental sustainability and climate change readiness.

The Asia Pacific region is rich in agricultural and water expertise and innovation. A key objective of the Initiative is to support and highlight existing and new country or basin-level initiatives that address key challenges that the region is facing with forward-looking strategies. By supporting leaders of change and by sharing their knowledge, methods, experience, practices and results it is possible to trigger a more general movement of change.

The initiative recognizes that, although they are facing similar challenges and need to address a range of common issues and questions, countries and basins in the region are highly diverse, pursue national development strategies and thus are likely to make different choices and pursue differentiated strategies. Their initiatives however can be supported by exchange experience and developing their capacity on processes and through guidelines, tools, references and communities of practice.

It is proposed to set a *network of centers of excellence* attached to country/basin initiatives that will offer capacity development or provide technical inputs on a range of water and irrigation tools and methods**.** These centers will be accredited to deliver capacity development on FAO tools and methods on *irrigation modernization and agriculture water governance.* They will play a role of *FAO reference centers* for those tools. These centers based in the Asia and pacific region, could support the coalitions of stakeholders (community of practice) engaged in irrigation modernization and agriculture water governance initiatives in the various countries and basins in the region. To reach that objective, these centers of excellence will work in collaboration with strategic *knowledge centers* - academic and professional institutions working on relevant thematic and geographic priorities in their areas of expertise-.

About the Regional workshop

The regional workshop was technical and targeted at professional and academics of the irrigation sector. It was organized as a follow up of another one on focused on tools to support irrigation modernization. Both workshop were organized as part of the regional initiative to “revitalize irrigation and agricultural water governance” (TCP/RAS/3304).
That workshop aimed in particular to set the basis with details and modalities for a regional network of centers of excellence and the community of practices around it with individuals and knowledge centers.

The more detailed set of objectives were the following:

- Assess-Capacity development needs, demands to support the transformation of the agriculture water management and governance,
- Review- Capacity offers and gaps to be filled to support the future revitalizing agenda on irrigation.

- Define- Regional Capacity development proposals* for effective agriculture water governance
- Discuss- a process and criteria's for accreditation reference centers for assessing new products and techniques as well as for certification of professionals in new tools, methods and competencies.
- Draw- a joint Roadmap to answer to capacity development requirements for implementing effectively the irrigation revitalization strategy.

* Initiatives include, among others those lead by FAO:
1) in Asia/pacific, a network of centers of excellence & knowledge center to strengthen irrigation modernization and improved agriculture water management.
2) in Central Asia in particular, an initiative to develop capacity on irrigation management across the three dimensions (i.e. individuals, organizations and enabling environment).
This work & the above initiatives will also be used by FAO as guidance for its future capacity development programs in the region.

Some Definitions:
Capacity development for FAO[1] is the process whereby individuals, organizations and society as a whole unleash, strengthen, create, adapt, and maintain capacity over time. It is an endogenous process that involves not only technical aspects but also social, political aspects. (A fundamental condition for a country to reach its developmental goal lies in its capacities at individual and organizational levels, and in the enabling environment) each of these three dimensions – individual, organizational and enabling environment – works interdependently with the others and influences the overall impact of a capacity development intervention.

It is therefore key to understand the capacities of a country in those three dimensions:
1) **Enabling environment** - it is the context in which individuals and organizations put their capabilities into action, and where capacity development processes take place. It includes the institutional set-up in a country, its implicit and explicit rules, its power structures and the policy and legal environment in which organizations and individuals function.
2) **Organizations** - defined as groups of individuals bound by some common purpose to achieve objectives. Organizational capacity refers to the collective capacity of its members to achieve their organisation's goal.
3) **Individuals -** capacities are developed at the individual level that lead to changes in skills, behaviors and attitude among a wide range of actors such as farmers, producers, policy makers, administrators and staff of organizations.

In preparation, participants were requested to contribute to an online survey on *Capacity Development to support irrigation revitalization and agriculture water governance. (Detailed reports are available on request to FAO).* In addition, a draft note on the accreditation and certification of the centres of excellence and individuals was distributed on the 25/2 and discussed (Annex 6).

Summary of the workshop

The workshop brought together about 45 representatives –government representatives or academics/researchers- from Australia, China, India, Indonesia, Iran, Nepal, Thailand, Vietnam,

[1] FAO capacity development, enhancing FAO's practices for supporting capacity development of member countries. LM1 learning module 1 .More available at: http://www.fao.org/capacitydevelopment/en/.

Malaysia, Uzbekistan, Kyrgyzstan, Tajikistan, Pakistan. It also had representatives from international organizations such as ICID, FAO, IHE-Delft, IRRI, IWMI, ICARDA/ICBA. FAO was represented by various divisions (TCI-Center of Investment ; NRL:Land and water division) and two regional Offices (RAP-Asia and Pacific ; SEC-Central Asia).

The workshop was organized over 2 days and a half in a step wise approach:

- Day 1 focused on the review of needs, gaps and existing offer of capacity development to support agriculture water management;
- Day 2 focused on the proposal of a network of centers of excellence, its governance, the criteria's and process for accreditations and certification of those centers;
- Day 3 (half a day) was focused on planning for individual centers and the network.

Main outcomes

- **Capacity development needs and gaps**: The irrigation profession is in a sorry state. There is not really a profession dealing with small scale agriculture water management. Significant effort should be put in professionalization for the whole spectrum from small scale to large scale irrigation systems, attracting and retaining professionals in agriculture water management but also in other fields (computing, automation, social. Environmental etc.) and outsourcing capacities. The survey on "capacity developments" provide interesting elements on needs and gaps.
- **Capacity development Offer exist, it is diverse and varied in all the countries but not adapted to today's challenges.** In particular there are a number of gaps including service oriented management, irrigation modernization, water accounting and auditing. The detailed survey on organizations provided more details on the existing offer.
- **"Need to Modernize the minds and the tools**"- improve capacities to govern and modernize irrigation systems: there is an agreement that the sector needs to modernize the way it looks at water management in agriculture as much as it needs to modernize the systems. There is a need for "capacity development for a wide range of stakeholders at all levels" from decision makers to farmer level. To achieve this, there is a need for tailored training packages, awareness raising activities, dialogues, and exchange within countries and across countries. There is also the need for "quality" services in assessing and planning modernization systematically. A certification and accreditation process on irrigation modernization will support this effort. Specific standards and requirements have to be defined for the different tools (i.e MASSCOTE, AQUACROP, CROPWAT, water audits, water accounting, …). Nevertheless, the irrigation profession is in a sorry state in the region. Attracting the talent required to boost its performance will require an ambitious and attractive project but also much better incentives and rewards.
- **Create an initial hardcore network of 6 national centers focused on irrigation modernization in Asia and the continuous development of MASSCOT*E* :** The Nanjing workshops adopted a vision and road map for the continuous development of MASSCOTE as a collaborative enterprise following a web-based, open-source model inspired by eWater Source**.** FAO, countries, their centers of excellence and future collaborative centers are moving towards joint development and ownership of the MASSCOTE methodology. In the Asia region, 6 national institutions have confirmed that they are ready, with the support of their respective governments to take a leadership role in irrigation modernization and are candidates to become accredited as FAO Irrigation Modernization Reference Centers, contributing to the development of MASSCOTE in specific areas of expertise, developing simplified and locally adapted versions of MASSCOTE, accredited to provide capacity development and advisory services in MASSCOTE locally but also throughout the region, as well as a range of other FAO water tools and methodologies (AQUACROP, CROPWAT, water

audit/accounting, etc.), and linking to local national programs, capacity development systems and managing local communities of practice. These are existing government-owned institutions (Malaysia's Centre of Excellence, owned by the Ministry of Agriculture and Agro-based Industry, is under development with support from TCP/RAS/3304). The candidate centers have reviewed and endorsed proposals by FAO for accreditation and certification, recognized other centers specific areas of expertise and contributions, and developed their own short term plans for 2013. The candidate centers recognize and expect a serious and meaningful accreditation and certification procedure managed by FAO and backed by key international organizations, as well as continued technical leadership and strong linkages from the FAO Regional Office. In addition, Thailand, through the Royal Irrigation Department, has expressed an interest in developing a FAO Reference Center, AIT has also expressed an interest5 in joining this network, and FAO and ICID are exploring the possibility of providing accreditation to the two ICID IPTRID Centers of Beijing and Tehran.

Table 1: National Knowledge centers (proposed centers of excellence)		**Thematic Focus**
AC IWRM	India, Karnataka	Integrated Water Resources Management (IWRM), Systems, Basins
VAWR	Vietnam	Water Resources Management, Disaster Risk Management, Climate Change, Land Use
IWHR	China, Beijing	Basin Management, IWRM, Water Saving Irrigation Technologies
WHU	China, Wuhan	Water Saving in Irrigation in paddy, Irrigation System Management, Pump and Pumping Station, multiple uses (MUS)
JMK	China, Jamaikou	Pump and Pumping Station Operations, Water User Assoc., Service Oriented Management
MADA	Malaysia	Planning, Design, Operation and Maintenance of Irrigation Scheme for Paddy, Managing Economic Transition (policy formulation, strategies and action plans)

These centers are knowledge centers. They will develop tools for modernization AND capacity development with the aim to link to action. Most of them wish to use and train on MASSCOTE and other FAO tools. If they respect standards and requirements for training on FAO tools, they will become "FAO Reference Centers". These Reference centres will help countries to:

- Improve, adapt and simplify existing tools
- attract resources to the region
- allow expansion to other regions
- be focused on irrigation modernisation
- disseminate tools and methods more effectively
- increase credibility of national centres

- In Central Asia, the Scientific Information Centre of the Interstate Commission for Water Coordination (SIC – ICWC) has expressed its interest to be a regional centre of excellence but this proposal would previously require the endorsement of the Central Asian governments. Simultaneously, with SIC acting as knowledge centre for the sub-region, key national institutions on irrigation modernization are being identified in Kyrgyzstan, Tajikistan

and Uzbekistan and their capacities and interests to become national centres of excellence with support of their respective government will be further ascertained.

- **Involve various knowledge partners.** The following partners have indicated a strong interest to be part of the community of practice and bring in a "pre-eminent knowledge offer" - capacity development package or tools/methods development- of national, regional and international importance, as well as "project experiences", and, in the short term, contribute to the development of MASSCOTE 2.0.

Centers/partners	**Location / Topics**
eWater Source	Australia
ICBA (at ICARDA)	Uzbekistan/ Salinization and waterlogging
UNESCO-IHE Delft	Delft, Holland
IWMI	Sri Lanka, India, Pakistan, Laos
IRRI	Laos, Philippines,…
Asian Development Bank	Pakistan / Economic aspects
SIC-ICWC	Uzbekistan / Water Saving in arid climates

- **Governance for a Network of centers of excellence**. The regional initiative proposes to set a network supported by a community of practice to support the revitalization of irrigation and agriculture water management. It will be based on a system approach with 1)"national centers of excellence" that have the capacity to do research, capacity development and have human capacities in house ; 2) virtual knowledge hubs that manage thematic knowledge and 3)nodes that favor exchanges across those hubs, 4) a network of individuals/experts/implementers. The overall governance of the virtual network will be coordinated from a secretariat at FAO supported by a board. Capacities will be delivered by national centers but coordinated by thematic centers (see detailed report - and the annex 4/group 1).
- **Certification process for individuals on Irrigation Modernization.** An initial proposal was made for certification on Individuals on MASSCOTE family of tools. It proposes three types of certification: 1) Participant (certificate of participation to training), 2) Practitioner (at least 3 MASSCOTE, one as a lead); 3) Trainer of practitioner (a lot of experience and a minimum of 5 MASSCOTE– 3 as lead). (see Annex –certification of individuals for details).
- **Community of practice to support Agriculture Water Management**: That community will be built around "the thematic nodes" (virtual unit that take the responsibility for major themes- those nodes are facilitated by a knowledge center) and "knowledge hubs" that provide full support to constituents (the centers of excellence would take that role) and finally the constituents that are local delivery units (these constituents can be individual experts or local organizations). The system will be built on a quality assurance scheme (certification and accreditation schemes with network of centers of excellence) and supported by a business model. The central component of the community to function is "the conversation".
- **The business Model proposed for the network is a " Freemium"[2].** It ccontributes "public goods" to the knowledge platform with a "Business Plan": providing services as revenues, certification against a fee. Centres have government agreements. FAO accepts to farm out its capacity development on its tools to FAO references centres.
- **Three main areas of actions to achieve all this**:
    - **Establish supportive partnerships**: with International Financing Institutions, Donors, Countries, States, Projects, local institutions, civil society, people and experts

[2] **Freemium** is a business model by which a proprietary product or service (typically a digital offering such as software, media, games or web services) is provided free of charge, but money (premium) is charged for advanced features, functionality, or virtual goods. The word "freemium" is a portmanteau combining the two aspects of the business model: "free" and "premium".

- **Establish national and regional centers of excellence**: Ensure local relevance and enhance capacity development. Ensure data integrity.
- **Deliver core technical support, content and learning outcomes from central pooled repository:** Host and disseminate tools and information, case studies and reference materials. Trusted International organization which will support and maintain for 20+ years.

Immediate Follow up

- **Agreement to move forwar**d: FAO, the candidate Reference Centers and technical partners agree to go as a consortium for development. Partners are willing to contribute : knowledge, expertise's, and resources to be part of the network. FAO technical program in the region will support that process.
- **Resources to act**. Resources exist on FAO side for: 1)Improvement of MASSCOTE 2.0 (development, testing); 2) Support for Accreditation of centers; 3) Development of Secretariat.
- **Milestones** proposed for a functional network: **June 2014**, with a set of intermediate milestones including:
  - In April 2013: A course on irrigation Modernization using MASSCOTE for university student in IHE Delft. A survey on capacity development in Russian for central asia.
  - In July/August : a prototype of mASSCOTE 2.0 ready for testing.
  - in September 2013 the World Irrigation Forum organized by ICID
  - In the next six months : a series of training/implementation of MASSCOTE and MASSCOTE 2.0 in various countries, including Vietnam, Indonesia, Philippines, Tajikistan, among others.
  - In June 2014 : the regional network of centers of excellence in place and functional
  - In September 2014: the centers of excellence certified, a first group of masscote trainers certified.

Detailed Report

This section provides more details about the workshop content, details about the presentations, main points of discussions and key outcomes from working groups. The report follows the daily agenda (Annex 1).

Day 1 -4/3/13- REVIEW capacities needs/gaps and offer

(Facilitator: Domitille Vallée, FAO; Lead Reporter: Robert Carr, e-Source supported by Sessions and working groups reporters)

1-Introductory Session:

This session started with the welcome address, **Mr Thierry Facon**, Senior Officer, Regional Office for Asia and the Pacific, Food and Agriculture Organization of the United Nations welcomed the participants and provided some background on the regional initiative and specifically the pillar on capacity Development. He highlighted the essence of the challenge –managing transitions- and illustrated some of them 1) From unsustainable growth development patterns to "green growth"; 2)From planned to market-driven economies; 3)From water abundance to water scarcity; 4)From supply enhancement to demand management; 5)From informal to formal water economies; 6)Rural to urban population shifts; 7) From subsistence to commercial farming. Thierry Facon gave an example of a well documented and organized project in China which had many tables and metrics- the example of the Jamaikou irrigation scheme annual report. That report *(Jaimakou yellow river diversion Bureau, 2012, enumerate the Jamaikou, 2002-2012*). That exemple enables to see the changes introduced in the management of the irrigation system, including a service hall where farmers can order the water supply (water ticket), as well as the effects of the training and documentation components. Over the last 10 years, capacities have changed, income of staff and farmers have increased. Thierry posed some challenging questions about the 'shape' of the professional society and what kind of programs are appropriate to each country. (PPT1)

Introductory Presentations

- **First, Ines Beernaerts**, Land and Water Officer, Sub-Regional Office of FAO for Central Asia gave an inspiring concept of unleashing the potential of existing capacity. She clarified the terminologies about capacity Development. For FAO[3], capacity development is the process whereby individuals, organizations and society as a whole unleash, strengthen, create, adapt, and maintain capacity over time. It is an endogenous process that involves not only technical aspects but also social, political aspects. In particular she illustrated its multiple dimensions – enabling environment, institutions, individuals-, the diversity of needs and requirements and the available tools for assessing capacity gaps for strengthening it for improved management). (PPT2)
- **Then Robina Wahaj,** Irrigation Offer, FAO-NRL, completed the introductory presentations by setting the scene of FAO capacity development agenda in agriculture water management. She gave a summary of FAO's objectives for agricultural water management and the various programs, tools and manuals that have been developed and are being delivered to what target groups and their partnerships. She highlighted the need for a flexible system that considers level and target groups to structure the capacity development offer (package). Partnerships are key : internally with the water platform and externally with close relations with Other UN Organizations (UN_WATER), ICID, IFIs, CGIAR, Regional and National partnerships. (PPT3)

[3] FAO capacity development, enhancing FAO's practices for supporting capacity development of member countries. LM1 learning module 1 .More available at: http://www.fao.org/capacitydevelopment/en/.

2-TECHNICAL SESSION 1- KNOWLEDGE GAPS

The first technical sessions aimed to look at the knowledge gaps and capacity development needs.

Presentations

- First Daniel Renault presented the take away messages on capacity development from the "irrigation modernization workshop, Nanjing- 28/2 to 2/3"and one of the concrete outcome, proposing a new specific step was proposed for MASCOTTE that would map out the 'known unknowns' including attitudes. (PPT2.1)
- Domitille Vallée, Agriculture Water Management Specialist, FAO, gave a detailed presentation about the outcomes of the survey on "capacity development to support irrigation revitalization and agriculture water management". The survey aimed to gather inputs on capacity development needs, demands and offer to support improved agriculture water management and its governance. a complementary survey on ORGANIZATIONS enabled to gather detail on capacity development Offer. The following points were highlighted: lack of financing into capacity development, highest needs are at field and irrigation block level but also at national and international levels. Capacities to be strengthened are both technical (management of tools…) and functional (ability to manage, to budget etc.) Some of the key areas for training are the ability to assess resources and demands (water accounting), the ability to manage scarce resources (water saving), the ability to manage multiple use (multiple use systems, the engagement processes (service oriented management and facilitation processes) among others. There is a high demand for training on tools as MASSCOTE, service oriented management, crop water requirement etc. (PPT2.2)
- Finally, Ines Beernaerts proposed definitions and processes involved in developing a Capacity Development initiative to guide the group work on "needs and requirements". (PPT2.3).

Working group session (1)

The groups worked on the question of problems/knowledge gaps and skills /knowledge requirements needed to support effectively the revitalization strategy in ASIA. Each group defined a learning objective - a statement of what a learner should be able to do at the conclusion of the learning activity- that would guide the assessment of capacity offer. The key outcomes from the groups are summarized thereafter (Details in Annex 2):

1. **Group on Central Asia** suggested a menu of choices that they could select in each local condition and brought in more factors like agronomy and cross-cutting issues like financial etc. Target group depends on the topic which depends on the location. They proposed two main learning objectives: 1) improve water efficiency ; 2) improve land productivity.
2. **Group on China** suggested centers of excellence should be the horizontal connection. Different types of users need different types of materials from learning to training. They proposed to focus on : Strengthen institutional capacity in irrigation modernization.
3. **Group on Malaysia** thought that the theme should be on governance and the people involved. They want benchmarking of service levels because this captures all aspects of governance. They propose to focus on the following learning objective:
4. **Group on Indonesia** identified the following Learning Objective : Improve capacities of irrigation and water professionals in modern concepts, techniques and technologies(increase knowledge among stakeholders at the national and local levels). They highlighted the following gaps : knowledge delivery, lack of linkage with international organization for capacity development.
5. **Group on Vietnam**: the centre of interest was to understand why irrigation systems are inefficient at all levels and this should be the learning objective. There is some training on water balance and legal and policy but it is not strong. Many other areas are needed.
6. **Group on Thailand** highlighted the following areas of development : More effective water resources development policies, strategies and investment frameworks; Improved legal,

financial and managerial capacities of professionals to improve the cost recovery and effectiveness; Pollution control and improved re-use of water for agriculture. They also stressed upon the fact that staff/professionals need to be able to do irrigation modernization, and in particular use tools/methods.

7. **Group on South Asia** suggested communication was most important. They proposed a focus on service oriented management, legal/policy frameworks and information systems for management (automation etc.).
8. **The international group** proposed to focus ways to incentivize knowledge about irrigation modernization into a train-the-trainer type approach.

3-TECHNICAL SESSION 2- OFFER versus NEEDS

The second technical sessions aimed to assess the status of the capacity development offer in the region and whether or not, the offer matches the needs and requirements.

Presentations

- **Dr Prasad from IHE-Delft** (Holland) presented IHE program and learning objectives. He highlited the fact that there are alreacy available a lot of knowledge and technologies to enable improved agriculture water management at all scales. The challenge is to match generic knowledge to specific conditions and change of conditions. The main constraints are capacity constraints of both institutions and individuals. Capacity development is required (most of the learning is when teaching others) and should use the diversity of means today available: Capacity development through Education and Research; demand driven, partnerships, knowledge network, multilateral research, innovative educational activities as distant programs. In particular, he illustrated e-learning campus of IHE delft, including a course on Service oriented management (SOMIS). (more details - **www.unesco-ihe.org) (PPT3.1)**
- **Dr Dong Bin, University of Wuhan (China)** gave a very detailed presentation about the capacity development targeted at professional irrigation management and in particular for the modernization. He illustrated the RAP/MASCOTTE applications in China and commented on the need to tailored it to meet local conditions and simplify it because it is complicated. More training and workshops are needed as there are 400 large irrigation systems and more than 5000 medium sized irrigation districts. None of the 11 applications of MASSCOTE have yet fully implemented the 11 steps. In China the outcomes of MASCOTTE are not used to inform the investment strategy in the country as there is a different approach to evaluating investment in irrigation areas, so this also makes it complicated. (PPT3.2)
- **Dr. P.S. Rao, ADB consultant and representative of the Advanced Centre for IWRM Bangalore (India)** presented an innovative project of capacity development for Farmers for improved GW management In Andhra Pradesh based on the concept of the farmers field schools. The project was the ANDHRA PRADESH FARMERS MANAGED GROUNDWATER SYSTEMS PROJECT (APFAMGS project), funded by the Government of Netherlands and managed by FAO but Implemented by network of 9 NGOs & 63 Farmers societies. The concept was to Demystifying hydrological science using a variety of communication/ awareness techniques and Build capacity of farmers to generate, share & analyze the data through participatory hydrological monitoring. The idea was to enable farmers to manage their water use within a delineated hydrological unit and make the difficult decisions of water allocation themselves on the basis of an understanding of the meaning of certain groundwater levels and crop water budgeting.

In the discussions that followed, a representative from Central Asia expressed great interest in centers of excellence and had requested such a network formally. Turnover of staff is an issue which

requires constant re-training. A representative from India indicated that the local scale training around water information systems has lead to significant increases in crop diversity and knowledge.

Working Groups session (2)

The afternoon working group session investigated offers and gaps around learning outcomes identified in the morning sessions. Groups had different feelings/shape: 1) Peacemakers; 2) conductors; 3) Facilitators; 4) Complicators, 5) Smart, 6) Imaginators.

After the feedbacks from the groups (detail in Annex 3), the workshop was closed for the day but followed by a intriguing Chinese multicourse dinner.

Day 2 – 5/3/13 –PROPOSE a process to strengthen capacities

Summary of the morning

We got a livelily start of the day with the call of the chicken and we were kindly told that he is carefully keeping an eye on the time for each session.

4-TECHNICAL SESSION 3- NEW capacity development

Presentations

- **Peter smith, NSW DPI, Tamworth, Australia**, shared his experience on the certification systems in the irrigation sector in Australia, offering ideas for the establishment of a quality assurance mechanism. The certification systems exist for a range of stakeholders including irrigation designers irrigation systems installers, irrigation managers (farm not schemes), irrigation retailers, irrigation agronomists, meters validaters. Certification designates a person is qualified to perform a job . Peter explained the process of certification (prior learning, training in specific competencies) . There are some guidance documents to set the standards expected : Australian Code of Practice for On-farm Irrigation (*www.irrigation.org.au/index.cfm?/publications/downloadable-publications*). *He* offered concrete example of certification schemes, for exemple the myBMP that enable farmers to be certified good cotton growers (example: myBMP= my best management practice for cotton growers, www.mybmp.com.au designed to be a "one stop shop" for farmers and industry to access latest information and research, find solutions to challenges, and provide a wide variety of tools to help industry members operate at optimal efficiency). Another exemple was **PROwater® Irrigation Training Series**, NSW DPI *www.dpi.nsw.gov.au/agriculture/resources/water/irrigation/sustaining-the-basin/training* .
- **Manthritilake Herath, IWMI, on behalf of Kristina Nikolaevna Toderich, ICARDA/ICBA** presented the 'New requirement for capacity development – the challenge of s alinity management in irrigation systems in Central Asia'. The presentation highlighted the severity and extent of land degradation and water quality degradation in the sub-region, including the economic losses associated with this major issue (2 billion $ per year). Salinity and waterlogging affect almost 90% of the lower Amudarya reaches. While Central Asia is making a call for funds, experts are trying their best to look for simple solutions for farmers. The presentation provided concrete examples of 'Appropriate small-scale community-based measures' (biodrainage, biosaline conservation agriculture) which could be upscaled. FFS for salinity management would be very appropriate to upscale these best practices. Chinese experience – salinity issues are serious in the China plains. This experience can be shared. (Partnership: www.cac-program.org; www.cacaari.org -including Michigan State University)
- **Robert Carr , e-source Australia**, clarified what is a community of practice and competencies. He defined the community of practice as a group of people who share a craft and/or a profession. It can evolve naturally because of the members' common interest in a particular

domain or area or it can be created specifically with the goal of gaining knowledge related to their field. It is through the process of sharing information and experiences with the group that the members learn from each other, and have an opportunity to develop themselves personally and professionally . The functioning of a community builds on a system approach with a process of feedback and iteration that results in improved competencies (competencies are a combination of personal attributes, skills, abilities and knowledge). He insisted on the fact that the central element is the conversation.

Facilitated Discussion on the future of the profession

As a follow up of the presentations, discussion was facilitated by Thierry Facon to touch upon challenging questions regarding the future of the profession and the need for renovated strategies and tactics for structuring capacity development offer".

- Where is the profession going? The profession need to reinvent itself to be able to adapt with changing context of multiple uses, increased scarcity and performance requirement. For example, In Central Asia, since independence, the infrastructure and management systems which were developed during the Soviet-era have not been appropriately maintained and are derelict, resulting in unreliable and inequitable water services with significant environmental impacts (including salinization and/or waterlogging). Engineers in the profession require updated training to be able to face the new challenges (in the Irrigation Department; Ministry of Justice – WUA Union – TC functional operational).
- Which new set of skills are required to manage transitions? For example, should we go towards concentration or distribution of knowledge (or skills)? Skills to help look beyond the traditional way of doing business. When the irrigation sector will move to the other sectors, it will move to the benchmarking of the other sectors.
- The missing link between research and action '?Turning food security and sustainable environment. Development objectives are very different according the socio-economic development of the country. How do you communicate our insights to mobilize resources?

The missing link? CRP5? The 'right hand do not know what the left hand is doing' (India). Professors/researchers need to get their hands. (Iran) – Conceptual research is taking over the application research because researchers come from Universities and professors are not engaged in real operation system.! To encourage researchers work with the industry in Malaysia (demand driven, according to the needs).

5- STRATEGIC SESSION 1– Centers of excellence and community of practice for Asia & Pacific

Panel of knowledge centers, proposed centers of excellence

Thierry Facon facilitated a panel gathering proposed centers of excellence: China, Uzbekistan, Malaysia, Vietnam and India. The panelists were asked about their future plans, their motivations and how they preparing the transition to 'Irrigated agriculture works as a business' and contribute to bridge income gap for the farmers.

- **Central Asia by Vadim Sokolov, ISC, Uzbekistan:** For a long time, the water managers ('mirov") was an untouchable person but today the situation has changed. The prestige of the profession dropped because of the low level of income of engineers working in an irrigation scheme. The profession needs to widen its knowledge base: not only in water and soil but also economics, finance, social (transboundary – diplomacy). There is a clear role for centers of excellence in that context. The SIC (under the supervision of 5 authorities ICWC), is a consortium of irrigation designers. It is necessary to offer three areas of expertise: 1) water delivery –supply, infrastructure and service level -delivery in space and time, reliability and flexibility-, 2) water use and 3) land reclamation. These knowledge should be tailored differently for professionals, farmers and water users. In CA, there are different starting point

depending where you are. 20 years ago, independence. Shift from a centrally-planned economy to a more market-based economy. The agricultural reforms are on-going. Even professors require an update of knowledge in the sub-region. At field level, in Uzbekistan, we start with 'a zero knowledge base'*. The link to food security is important, t*he centers of excellence should prepare the farmers on how to increase their income and prepare business plans, processing, marketing (contract farming).

- **Malaysia by Zalilah Selamat, MADA:** The Focus is put on food security and the aim is to 'change the way we do things' at all levels in order to plan transitions and manage them more successfully. With the Center of Excellence, it is expected that we can streamline the thinking of the people at all levels (e.g. policy-makers, farmers, ..) in order to revitalize the agricultural sector (link with the agro-industries). It is also expected to enable farmers to develop their skills and carry out research in the field with them. In particular, the center could help them develop their business skills and make sure that they become entrepreneurs.
- **Vietnam, by Nguyen Tung Phong ,VAWR/Director CTIC :** The irrigation sector should be revitalized. The new training center will help modernize the sector and ion particular (infrastructure and irrigation models),. The new curriculum will target 'Irrigation and water resources management'. The ratonal of having a center of excellence is to conduct projects on irrigation modernization, learn from them and respond more effectively to requests from Ministries.
- **China by Dong Bin, Wuhan University** - Three centers of excellence are proposed for China. Why? In the West, it is more urgent to produce more crop per drop. Policy and strategy formulation. The 'Institute of Water Resources'. Sharing of experience (learning from other countries such as Australia, including self-regulation and sharing with the other countries). 120 years of anniversary. There is a new research field for environmental service. Salinity control in Mongolia and the North of China plains. Jamaiko: Centre of Excellence dedicated to water management (including pumping). It is expected that by carrying out a research in the field (i.e Jamaiko), you can contribute to new knowledge and use the center of excellence to make that knowledge accessible. Knowing the demand for irrigated products (self).
- **India by Somasekhar Rao Polisetti , Karnataka IWRM center –**Currently Setting up of an Institute – Karnataka under the company law. The focus is on Integrated river basin planning (water resources group 2030 in Geneva). It is proposed to use various techniques on WUE with the national commission; policy research in the next agenda. The objective is to create a p**artnership –** More than 300 engineers were trained in MASSCOTE already ; the aim is to demultiply the effort. The center of excellence comparative advantage will be to have a focused agenda responding to the needs of the countries; cross-sectoral approach and multiple partnership for multiple target audience.

Working groups session (3)- Defining the network , rules and criteria's

A tentative framework has been defined for the regional network aiming to strengthen the capacities in agriculture water management. It includes the following elements : 1) **Knowledge centers** – centers recognized for their knowledge and know-how, and can be included in the knowledge network or hub. ; 2) **Center of excellence** are knowledge centers existing or being created with the aim to offer high quality , specialized capacity development packages to support improved agriculture water management, ; 3) When those center plan to use FAO tools and methods , they can be accredited to become ***FAO reference center***.; 4) **Community of practice gather** individuals with knowledge experience, and interest on the key topics of agriculture water management. They can be part of an organization, a network, or be independent.

Six working groups were set to discuss the operational aspects of that network with a process to enable participants to contribute to lively discussions in most of the groups.

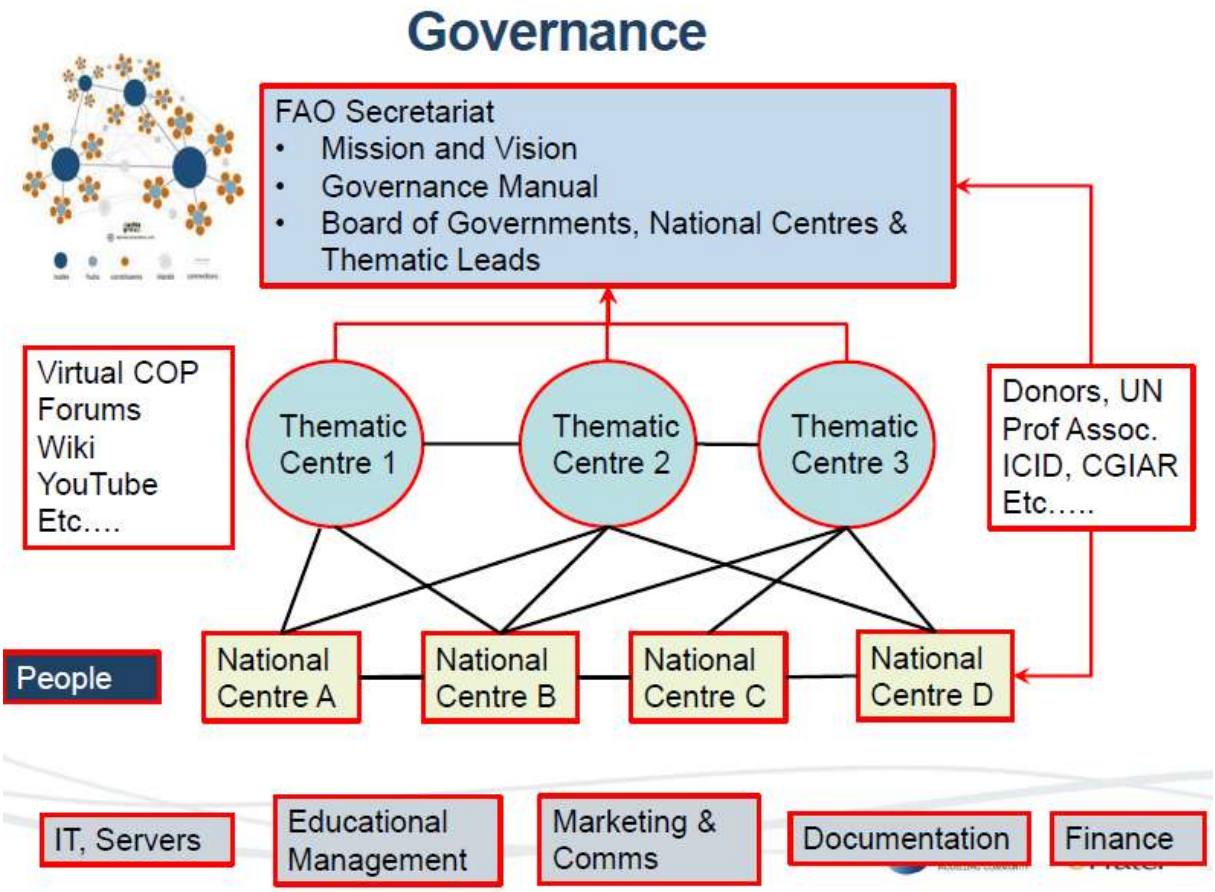
	Group subject	Guiding questions	Facilitator/ Rapporteur
1	Governance of the whole network of centers	• Who and how: regulators and clients • Resources for establishment and sustainability • Making it happen: way forward	Robina Wahaj / Robert Carr
2	Centers of excellence: accreditation, modalities and efforts required	• MASSCOTE and other FAO tools: merge proposals W1 and W2 for Reference Centers? • Recognized Knowledge Centers: Centers of Excellence? • Confirming the initial set of Centers and their specific area of mandate • Reviewing the proposed modalities • Efforts required for accreditation • Resources for establishment and sustainability	Thierry Facon / Somasekhar Rao Polisetti
3	Certification of individuals for MASSCOTE and other tools	• Certification as a necessity? • Requirements for MASSCOTE and other tools • Modalities, targets and money	Daniel Renault / Peter Smith
4	Linking capacity development to policy	• Policy makers as target: how and what? • Policy makers as empowers: how? • Policy makers as guidance: what?	Zhijun Chen / Raza Farrukh
5	Linking capacity development to action: implementation and sustainability	• Reaching and attracting the clients • Mobilizing national capacities • Building into development and investment programmes	Domitille Vallée / Ir. Mohammad Zainal Fatah
6	Generating and sharing knowledge from the field	• Changing incentives for organizations and individuals • Organizing sharing • Users as capacity developers	Sangam Shrestha/ Pham Thi Phuong Thao
7	Monitoring and evaluation of process and impacts	• Selling capacity development • Checking effectiveness • Maintaining relevance	Ines Beernaerts / Herath Manthrithilake

The main outcomes of the groups are summarized thereafter (**details in the Annex 4**).

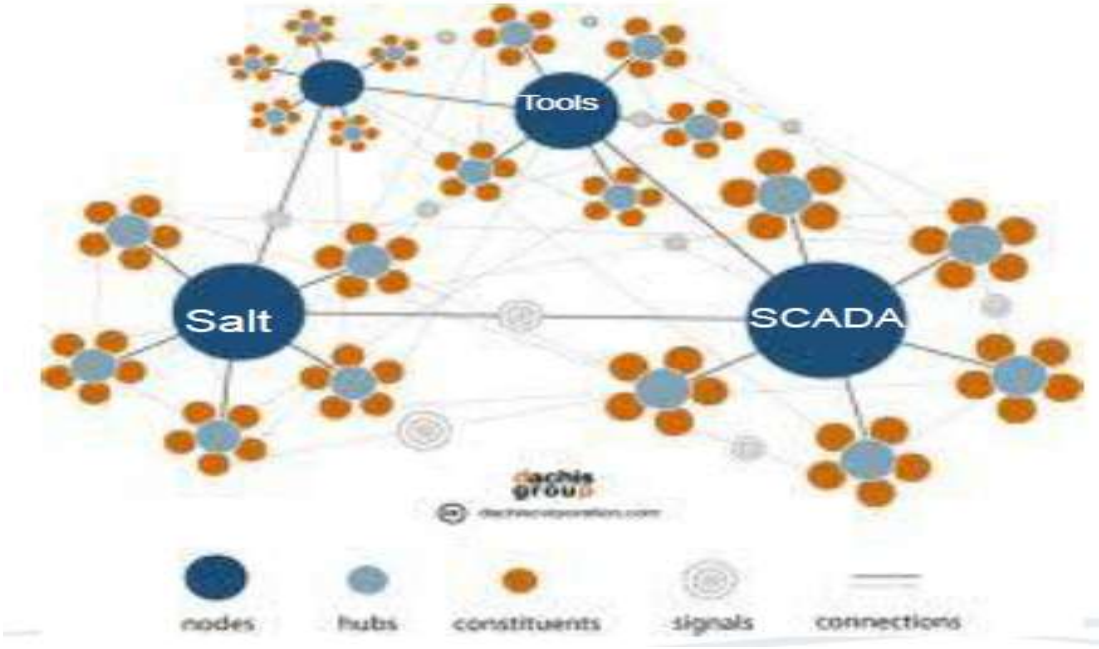
1-Governance

- FAO should take the lead and manage a secretariat. Partners will advise and be in a kind of advisory board. The partners include ICID; other UN organizations such as UNESCO-IHE; International Financing Organizations , such as ADB, WB; CGIAR (IWMI, IRRI); Governments.
- Governance structure for center of excellence relied on national, regional and International networking and contribution.

- Exchanging official agreement between FAO and countries and organization for authority of center is needed.
- Introduced many ways for financial revenue.
- FAO and partners should do accreditation of the Centre.



Graph 1- governance of the network to strengthen capacity for irrigation transformation and agriculture Water governance.



Graph 2: community of practices on agriculture water management

2-Centers of excellence (CoE)

- CoE would also like to contribute to the development of MASSCOTE 2.0
- There are many organizations and research centers in the region, which should cooperate with each other and be part of the networks
- Standards and criteria need to be set up and established and performance of CoE should be assessed and benchmarked continuously.
- CoE need plans on how to achieve standards: Infrastructure, technical capacity, etc. They need to assess their present capacities and support needs.
- CoE should have business plan. To start with they should continue with FAO projects and compliment with resources from within the region.
- Govt. confirmation and support for creation of these CoEs is needed and has already been acquired.

Table 1: National Knowledge centers (proposed centres of excellence)

		Thematic Focus
AC IWRM	India, Karnataka	Integrated Water Resources Management (IWRM), Systems, Basins
VAWR	Vietnam	Water Resources Management, Disaster Risk Management, Climate Change, Land Use
IWHR	China, Beijing	Basin Management, IWRM, Water Saving Irrigation Technologies
WHU	China, Wuhan	Water Saving in Irrigation in paddy, Irrigation System Management, Pump and Pumping Station, multiple uses (MUS)
JMK	China, Jamaikou	Pump and Pumping Station Operations, Water User Assoc., Service Oriented Management
MADA	Malaysia	Planning, Design, Operation and Maintenance of Irrigation Scheme for Paddy, Managing Economic Transition (policy formulation, strategies)
SIC	Uzbekistan	Water Saving in arid climates

3-Certification on MASSCOTE and other tools

- Certification should be done at 3 levels: Participants; Practitioner, Trainer of Practitioners.
- Certification should only be for individuals. CoE should be responsible for certifying the practitioners;
- Criteria should include: five years experience, participation in at least two MASSCOTEs, completion of at least one MASSCOTE without supervision;
- A question is “is MASSCOTE too big for an individual to be trained in?”
- A jury should be established to evaluate the potential candidates for certification.
- TCI-FAO mentioned that they have 9 irrigation engineers who should all be trained in MASSCOTE to be able to incorporate it in the investments projects.

4-Linking capacity development to policy

- The concept of policy, as well as, vision and mission to develop capacity brought out by group
- Policy maker as the target divided in 3 levels: Political Leader, Administrative leader, Technical leader.
- What capacity development needs for each target and how to achieve the goal carried out

- Example from India – There is no policy on CD in India but in Karnataka state has been made it compulsory for irrigation managers to have 2 trainings per year if they want to be considered for promotion.
- Example China: National Master Water Plan was rejected by the Government because it did not include Irrigation modernization.

5-Generation and sharing of knowledge from the field

- Individual: Technical performance evaluation, provide simple information and manual for farmers – incentives and facilities for individuals
- Share knowledge goes by field trip, workshop, e-discussion, media, bulletins – funding to collaborate with other partners is an issue
- Dissemination of knowledge by farmers to farmers would be easy adapting

6-Monitoring and evaluation process

- How to measure the changes on knowledge, experiences, skill, attitude, responsibility are always under negotiation
- Improving overall performance and fulfillment of pre-tasks are expected as the result of monitoring.
- Measuring impact of capacity development brought out four indicators as follows: Relevance, efficiency, effectiveness, sustainability
- Identification of few (limited set of) smart indicators is necessary
- How to sell CD and to maintain relevance are the important issues that should be addresses in M&F of CD programmes
- Useful references: http://qualdata.net.au/ ; http://www.couttsjr.com.au/

7-Linking capacity development to action

- Setting up Capacity development , define the needs and gaps, as well as, systematic approaches at National, Basin, irrigation scheme and On-Farm level should be done
- Less conflict on water allocation, transparency on roles and information data base, and at the end increasing income in all level would be the indicator for processing the action
- Facilities, requirements, legal and intuitional needs for put capacity development in action explained by group
- Add a step in MASSCOTE for Capacity Development – may be in the beginning.

Day 3 -6/3/23 –PLAN the way forward

The day started with reporting of the sub-groups from the previous day. The key messages were

- Good governance of the initiative and whole process of Irrigation Modernization CD, and Centre of Excellence is important. FAO will take the lead but work closely with the partners (UN, ICID, CGIAR, IFIs (ADB, WB) National Governments);
- Centre of Excellence must have business plan
- Policy should be based on vision and vision must take into account the ground realities
- We must not lose sight of our goal and mission.
- Smart management of smart investments and Smart incentives for small management
- Users should be considered as capacity developers
- Measuring change is difficult but doable

6- Strategic Session 2 – Building partnerships, synergies and planning

Presentations

- Mr Sangam Shrestha, from the Asian institute of Technology (AIT) presented on behalf of Mukand S. Babel their programme(s) and what they can in term of capacity development.

The institute has 2300 Students from 47 + Countries/Territories ; 600 Research and Support Staff from about 30 Countries. It has a school of engineering and technology, a school of environment, resources and development that includes bio-resources, development studies, and energy and environment, and a school of management. They also organize non degree training courses that includes exposure visits. AIT has offices in Vietnam, in China/shangai, in Indonesia, in Nepal, and in Afganistan. They have three programs related to agriculture management : 1) a Agricultural Water Management (AWM) for Enhanced Land and Water Productivity (since Aug 2010) with UNESCO-IHE, The Netherlands; e-learning Diploma Program on Integrated Water Resources Management (IWRM) Offered by the UNU-INWEH Regional Water Virtual Learning Center (WVLC) at AIT Established in 2005, with 4 batches completed as of January 2011 ; a Certificate Program on Service Oriented Management for Irrigation Systems (SOMIS) Offered since January 2009 in collaboration with UNESCO-IHE, The Netherlands . (PPT 3.1)

- The learning initiative on irrigation modernization for Central Asia was initially going to be presented but it was decided not to do it as it will be significantly revised as a follow up of the workshop. Some elements are available in the Annex 3.

Working group session (5)

The Last session was dedicated to a share fair where the 5 proposed centre of excellences could discuss their workplan to others interested by their offer, and build partnerships. In addition, FAO and international organizations discussed the roadmap of the whole initiative for 2013. The detailed planned are available in Annex .

Some key elements are summarized thereafter:

- **Agreement to move forwar**d: FAO, the candidate Reference Centers and technical partners agree to go as a consortium for development. Partners are willing to contribute : knowledge, expertise's, and resources to be part of the network. FAO technical program in the region will support that process.
- **Resources to act**. Resources exist on FAO side for: 1)Improvement of MASSCOTE 2.0 (development, testing); 2) Support for Accreditation of centers; 3) Development of Secretariat.
- **Milestones** proposed for the setting and content of a functional network:

In March 2013 :

- information sharing on regional initiative and communication with potential donors at the ADB Water week 2013, Philippines.
- Reports of workshops prepared, and disseminated
- India/Karnataka – discuss with e-water for partnership

In April 2013:

- Concept note for the functioning of network & centers of excellence
- Web based platform for irrigation modernization community of practice set
- University curricula: A course on irrigation Modernization using MASSCOTE for university student in IHE Delft.
- Survey on capacity needs and requirement in Russian in central asia.

In May/ June 2013:

- Information sharing on regional initiative and communication with potential donors at the Asia Pacific Water Summit, Thailand.
- MASSCOTE application planned in some countries: Vietnam, Tadjikistan (tentative)
- Central asia : Concept note 'Learning initiative on irrigation modernization for Central Asia' submitted, endorsed by all key partners and resources mobilized in June 2013.
- Malaysia –establishment of center of excellence.

In July/august 2013

- Build prototype of MASSCOTE 2.0 and a Business plan – freemium
- MASSCOTE application continue in other countries : India, Tadjikistan

In august/October 2013 :

- test prototype pf MASSCOTE in various countries,
- MASSCOTE application using new version in Malaysia, Indonesia, Philippines , China among others

In September 2013 at the World Irrigation Forum 2013

- Information sharing on regional initiative, and expansion to other regions
- communication with potential donors ,
- Progress monitoring,
- Start process of accreditation of centers (panel will meet at forum) and certification process for individuals (committee for certification will meet at the forum)

In November/December 2013

- Finalize MASSCOTE 2.0 prototype
- Process for the Training of trainers starts (linked to MASSCOTE applications)

In January to May 2014

- Dissemination of the tools and methodologies
- preparation of training material on MASSCOTE (video in different languages, training packages on masscote steps etc).
- Malaysia, China : preparation of training packages
- Training of trainers on MASSCOTE continues

In June 2014:

- Regional Network with centers of excellence is set and functional. With clear TOR, standards and requirements for certification, training materials etc.

In September/October 2014: (next ICID conference)

- Certification of centers by panel
- Certification of individuals by committee
- Dissemination of materials and information about the capacity development offer in the region.

Annex 1: Agenda

Lead Facilitator: Domitille Vallée (FAO)

Time	Day One: 4 March **Lead Rapporteur:** Robert Carr
8:00-8.30	**Registration**
8:30-8:45	OPENING (**Rapporteur:** Daniel Renault/Robert Carr) Welcome address and statement with a perspective on what will change for future irrigation specialists in a context of transforming economies, Thierry Facon(10') Introduction of Agenda (5')
8:45-9:30	*INTRODUCTORY SESSION* **Rapporteurs:** Daniel Renault/Robert Carr *Presentations* • Defining Capacity Development, (its multiple dimensions, diversity, tools for assessing capacity gaps for strengthening it for improved management), Ines Beernaerts (10) • Setting the scene : FAO capacity development agenda in agriculture water management, Robina Wahaj (10) Round of perspectives from experts on their agenda and experience in capacity development (25)
9:30-10:00	Plenary discussion- (30) Brainstorming on "learning objectives for strengthening agriculture water management in Asia and Pacific" introduced by Ines Beernaerts with an example. *Wrap up by rapporteur (key topics) (5)*
10.00-10:30	TECHNICAL SESSION 1- KNOWLEDGE GAPS **Rapporteurs:** Daniel Renault/Robert Carr Presentations • New capacity development needs to support irrigation modernization (elements coming from the workshop on irrigation modernization) (Daniel Renault) *(10)* • New requirement for capacity development – the challenge of salinity management in farming systems (Kristina Nikolaevna Toderich) *(10)* *Discussion about presentations (10)*
10:30-11:00	**Coffee Break**
11:00-13.00	GROUP WORK-1 needs and requirements Introduction of group work with brief summary of the outcomes of the global survey on capacity development (D. Vallee) (10) *Group work 1* -Discuss problems/knowledge gaps and skills /knowledge requirements needed to support effectively the revitalization strategy in ASIA (70') Groups organized by geographical grouping (country, sub-regional, international) Debriefing and Plenary discussion – master list of skills and required capacity development modules- (40)
13:00-14:00	**Lunch**
14:00-15:00	TECHNICAL SESSION 2- OFFER and GAPS **Rapporteurs:** Rubento Lampayan/ Mohd Adnan Bin Mohd Nor • *Presentation* of a University Curricula introducing Service oriented management in irrigation (Krishna C. Prasad), *(10)* • *Presentation* of capacity development targeted at professionals on Irrigation management & modernization (Dong Bin) *(10)* • Example of targeted capacity development activities for farmers (Documentary about "farmers field schools on groundwater" in India + comments on experience by Somasekhar Rao Polisetti (10) • *Discussion on types of offers –participants feedbacks (20)* *Introduction of group work* with summary of the global survey on capacity development outcomes (D. Vallee) *(10)*
15.00-17.00	*GROUP WORK 2* on offer and gaps filling (80' – **coffee will be served during group work**) (each group will start with a short introduction by one participant who has a Capacity Development Offer to offer). (each group will have one facilitator and one rapporteur)
17:00-17:30	*Debriefing and* Plenary discussion – Wrap up -master list of existing offer and gaps to be filled (30)

Time	Day One: 4 March **Lead Rapporteur:** Robert Carr
18.30	**Dinner Reception**
Time	**Day Two: 5 March** **Lead Rapporteur:** Ines Beernaerts
8:30-8:45	DEBRIEFING & AGENDA **Rapporteur:** Ines Beernaert/ Krishna C. Prasad • Debrief and key points from Day 1 (20) • Agenda of day 2 (5')
8:45-9:30	TECHNICAL SESSION 3- NEW capacity development **Rapporteurs:** Ines Beernaerts / Krishna C. Prasad *Presentations* • Building certified technical capacities- the certification systems in the irrigation sector (Peter Smith) (10´) • Building functional capacities –to manage, and invest- to strengthen technical capacity (Heinrich Wyes) (10') Discussion on presentations (20')
9.30-10:00	Plenary discussion- on " the need for renovated strategies and tactics for structuring capacity development offer". (25) with *Facilitator: Thierry Facon (launch the debate with a short introduction)* *Wrap up by rapporteur (key topics) (5)*
10:00-12:30	GROUP WORK-3 – New Learning Packages Introduction of group work with brief summary of the outcomes of the global survey on capacity development (D. Vallee) (10) Group work (70') - Each group will define training modules for specific learning objectives (thematic). each group will have a facilitator and rapporteur) Groups organized by thematic grouping Debriefing and Plenary discussion – master list of skills and required
10:30-11:00	**Coffee Break**
	(Group work continues) (
12:00-13:00	Debriefing Compiling knowledge offer and needs for the proposed modules (what, when, who) Facilitator - Domitille Vallee
13:00-14:00	**Lunch**
14:00-15:00	STRATEGIC SESSION 1– Centers of excellence and community of practice for Asia & Pacific **Rapporteurs:** Manthritilake Herath/ Robina Wahaj Panel on Networks of center of excellence & Knowledge Centers and the role they can play Panel - China, Malaysia, Vietnam, India, Uzbekistan, Australia with an introduction on the idea of centers of excellence by Thierry Facon with Plenary discussion (60') Facilitator - Heinrich Wyes (TBC)
15:00-15:30	Brainstorming (30) on "Building adaptive capacities with a web based community of practice–a proposal for Irrigation modernization" introduced by a small presentation by (Robert Carr) (10')
15:30-16:00	**COFFEE BREAK**
16:00-17:00	Group work 4 – certification, accreditation, monitoring for selected learning modules (60') *Discussion in small, group on the processes to certify and give accreditation to organization to manage learning package and specific tools.* (each group will have one facilitator and one rapporteur who will prepare a summary to present day 3 in the debrief session)
17:00-17:30	Wrap-up and close

Time	Day Three: 6 March **Lead Rapporteur:** Robina Wahaj
8:30-9:00	DEBRIEF and AGENDA **Rapporteur**: Robina Wahaj / Mehrzad Ehsani Debrief from the groups and key points from Day 2 (40) Agenda of day 3 (5')
8:45-9:30	STRATEGIC SESSION 2- BUILDING PARTNERSHIP and STRATEGIES **Rapporteurs:** Robina Wahaj / Mehrzad Ehsani Presentation- An example of learning initiative in central Asia Ines Beernaerts (10) & Question (5)
	Plenary discussion on the partnerships and strategies to set between centers of excellence and knowledge and elements to build a roadmap for 2013-2015 (30)
10:30-11:00	**Coffee Break**
11:00-12:00	SHARE FAIR to build Partnership The proposed centers of excellence meet interested partners to refine their individual roadmaps. (outcomes will be documented for follow up – by a rapporteur for each center)
12:00-12:30	What next? International and regional agenda , network and partnership **Rapporteurs:** Robina Wahaj / Mehrzad Ehsani
12:30-13:00	**Wrap up, conclusions, closing**
13:00-14:00	**Lunch**
14.00-17.00	**FREE or INDIVIDUAL MEETINGS**

Annex 2: Working group session (1) – needs and requirements

Guidance for the groups

(on Needs and requirements to support improved agriculture water management , including irrigation modernization, and its governance)

This first working group session aimed to discuss skills and capacities needs and requirements to support improved agriculture water management. The work started with a quick review of the "competency level" available at the moment, ability of individuals in charge of managing irrigation, or water management to cope with change coming with the transforming economies, and global changes.

Table 1- SITUATION of competencies

INDIVIDUALS	Existence and quality	Able to cope with new agenda	capacity development needed (**)
staff /professional to manage irrigation systems			
staff /professional to assess irrigation system performance			
staff /professional to plan and implement modernization activities			
staff /professional to train on new approaches and methods for irrigation modernization			
staffs /professionals to train on new approaches and methods for crop water productivity improvement exist			
trainers are available to train on watershed management, and related themes			
staff /professional to train on new approaches and methods for water balance/audit/ accounting			
staff /professional to carry out piloting /testing activities			
Training opportunities for national staff/Professionals exist on all relevant subjects (*see list below)			
Training are regularly updated with new tools/methods			
Training are carried out using knowledge sharing techniques			

*example of relevant subjects:

Irrigation modernization;	Environmental assessment;
Water accounting/balance ;	Health assessment;
Integrated water resource management;	Stakeholders engagement processes and participatory processes;
Multiple use systems;	Economical aspects;
Climate change adaptation/mitigation for agriculture	Legal/policy aspects

** example of capacities areas

1. Policy and normative capacities	2. formulate and implement policies
3. lead policy and legislative reforms	4. Technical capacities
5. Knowledge & know how capacities	6. create, access and exchange information and knowledge
7. Partnering capacities	8. initiate and sustain networks, alliance and partnerships
9. Implementation capacities	10. Planning
11. implementation	12. monitoring and evaluating
13. design	14. construction
15. Operation and Maintenance	16.

Table 2 – FUTURE NEEDS/REQUIREMENTS

Then the group will focus on defining the "needed skills/requirements" for a limited number of capacity development outcomes, or leaning objectives.

A learning objective is a statement of what a learner should be able to do at the conclusion of the learning activity. (*The learning objectives should not be used to describe the content to be covered but to describe the intended results of the initiative. Well-formulated learning objectives focus on intended outcomes and reference the ways in which participants are expected to apply learning.)*

Each group will pick 3 key priority learning objectives from the list, formulate them better and discuss on the new skills and capacities required for each of them. If they have more time, they can start with their other favourites.

Tentative list of outcomes

1. Improved capacities to assess water resources and demand situation by all stakeholder
2. More effective water resources development policies, strategies and investment frameworks
3. More strategic planning to guide decision making
4. Improved skills for the management of scarce water resources at river basin,
5. Improved skills for the management of scarce water resources at irrigation scheme and field levels
6. improved skills of engineer to learn and deliver the adequate level of services
7. Technologies for affordable water storage, capture, lifting, use in agriculture
8. Improve capacities of irrigation and water professionals in modern concepts, techniques and technologies (i.e FAO tools as Masscote...).
9. Improved capacities of irrigation and water professionals to design, build and manage multiple use systems.
10. Improved legal, financial and managerial capacities of professionals to improve the cost recovery and effectiveness
11. More understanding of public private partnership (PPP)
12. Tools for performance at all levels
13. Capacity of farmers and water users to adapt to increasing climate uncertainties,
14. Capacity of farmers and water users to manage effectively shared infrastructure, and multiple use systems
15. Capacity of irrigation and water managers to adapt to increasing climate uncertainties and cope with water scarcity
16. capacity of professionals to integrate environmental and health impacts, as well as gender mainstreaming in water management
17. Pollution control and improved re-use of water for agriculture

Questions:

- What do you want your target audience to do differently?
- What skills or competencies do want them to learn, develop expand or improve, to support them in their jobs? *(are these competencies purely technical – engineering, irrigation scheduling etc- or functional –management, planning, financial assessment, stakeholder engagement-)*

target groups can be:

1. Student
2. lecturer /trainer
3. consulting firms
4. researchers
5. water users associations
6. farmers
7. general public
8. professional in water development
10. engineers / technicians
11. managers
12. policy makers
13. local institutions
14. extension workers
15. agronomists
16. communities
17. NGOs
18. all

Proposed Outcomes to be defined as learning objective	*Your priority*	*What to be done differently*	*New capacities required to support them in their job?*		*Target Groups?*
** (start with the one most important for your group)*			*(technical,*	*functional)*	

Note: When defining a capacity development initiative, the formulation of learning objectives should follow a detailed learning need assessment. FAO module /*Learning needs assessment check list – page 122 and 123*

China –learning objective and needs and requirements

Table 1- learning objective , competencies and needs

Key Learning Objective:	Strengthen institutional capacity in irrigation modernization				
Major Gaps:	Gov Departments	Professional Institutions	Irrigation management agencies	Farmers organization	Horizontal connection
Options:	Formulation of sector guidelines, standards, process and norms to realize gov. strategies and policies on irr. Modernization	Provision of suitable tools and methodologies on irri. Modernization Adjustment of university curriculums and training materials	Training on modernized operation and management	Establishment of WUAs Improved operation and management of WUAs	Establishment of cooperation platform Centers of excellences (IWHR, WHU, JMK)

Central Asia – learning objectives, needs and requirements

Table 1- assessing Competencies (Central Asia -Uzbekistan, Turkmenistan, Kyrgyzstan)

INDIVIDUALS	Existence and quality	Able to cope with new agenda	capacity development needed (**)
staff /professional to manage irrigation systems	National water authority, Basin organizations, CanalSystem Administrations, WUAs (staff quality – moderate)	Partially yes	All 15 directions + finance
staff /professional to assess irrigation system performance	National water authority, Basin organizations, Canal System Administrations, WUAs (staff quality – moderate)	Partially yes	1, 4, 5,6, 9, 10, 11, 12,13, 14, 15 + finance system
staff /professional to plan and implement modernization activities	Cabinet of Ministers, Ministry of Economic, National water authority, Basin organizations, CanalSystem Administrations, WUAs (staff quality – low)	Partially yes	1,2,3,7, 8 + investments
staff /professional to train on new approaches and methods for irrigation modernization	Research and Academic Institutions	Partially yes	All 15 directions
staffs /professionals to train on	Research and Academic Institutions,	Partially	4,5,6, 12 +

new approaches and methods for crop water productivity improvement exist	best WUAs	yes	agronomy
trainers are available to train on watershed management, and related themes	Research and Academic Institutions	Partially yes	1,3,5,7, 8,11,12,15+finance
staff /professional to train on new approaches and methods for water balance/audit/ accounting	National water authority, Basin organizations, Canal System Administrations, WUAs (staff quality – low), Research Institutions	Partially yes	+ IT
staff /professional to carry out piloting /testing activities	Basin organizations, Canal System Administrations, WUAs (staff quality – low), Research Institutions	Partially yes	
Training opportunities for national staff/Professionals exist on all relevant subjects (*see list below)	National water authority, Research and Academic Institutions,	Partially yes	All listed below topics + agronomy+ marketing
Training are regularly updated with new tools/methods	National water authority, Research and Academic Institutions,	Partially yes	All listed below topics + agronomy+ marketing
Training are carried out using knowledge sharing techniques	National water authority, Research and Academic Institutions,	Partially yes	

Suggested Framework for Capacity Development in Central Asia : learning objectives

Two directions, five sub-components:

Water Efficiency		**Land Productivity**		
Water Delivery	Water Use	Irrigation Modernization	Drainage and Salinity	Agronomy
Training Centers + Research, Academic Institutions	Field Farmers Schools			
WMO and WUAs	WUAs and End Users (Farmers)			

Knowledge Gaps/Skills Need for the learning objectives

1. Water Delivery component – balancing supply and use, indicators for uniform and stable water delivery (in time and in space), minimization of unproductive water losses, etc.
2. Water Use component – irrigation techniques and modernization, water accountability, CropWAT tools, agronomy, land fertility and productivity, etc.
3. Cross-cutting issues:
   - Legal and Institutional issues,
   - Financial arrangements for economic stability of both components (delivery and use)
   - Conflict management and mitigation
   - Information systems and communications
   - Drainage and salinity

It could not be one single Institution responsible for Capacity development in Central Asia – there should be created network of Centers of Excellency to address unique specifics of different parts and countries, but network could be managed under jointly agreed framework program and funding.

Table 2 – FUTURE NEEDS/REQUIREMENTS

Proposed Outcomes (learning objective)	*Priority*	*What to be done differently*	*New capacities required to support them in their job?*		*Target Groups?*
			(technical,	*functional)*	
Improved skills of engineer to learn and deliver the adequate level of services	Effective water delivery	More uniform/equal and stable delivery, less unproductive losses of water	New performance indicators, advanced managerial tools, MIS, SCADA, etc	Split functions on water delivery and use, new legal and institutional arrangements, Financial mechanisms and economic incentives	National Water Authority, Basin (provincial) organizations, canal administrations, WUA
Capacity of farmers and water users to manage effectively shared infrastructure, and water use.	Effective use of water and land productivity	Water saving, more crop per drop, increased income	Improved irrigation at field level, water management at WUA level	Policy on agriculture reforms, financial and economic incentives	WUA, farmers

Indonesia

- **Learning Objective** : Improve capacities of irrigation and water professionals in modern concepts, techniques and technologies(increase knowledge among stakeholders at the national and local levels).
- **Gaps** include knowledge delivery, lack of linkage with international organization for capacity development.

Table 1- Capacity development areas to support the learning objective

Technical Topics:	Functional Topics:
1. Irrigation modernization;	1. Knowledge & know how capacities
2. Water accounting/balance ;	2. Partnering capacities
3. Multiple use systems;	3. Implementation capacities
4. Stakeholder assessment	4. Operation and Maintenance
5. Stakeholders engagement processes and participatory processes;	5. Create, access and exchange information and knowledge
6. Economical aspects;	6. Initiate and sustain networks, alliance and partnerships
7. Legal/policy aspects	7. Planning
	8. Design
	9. Monitoring and Evaluating

Thailand

Table 1- SITUATION of competencies

INDIVIDUALS	Existence and quality
staff /professional to manage irrigation systems	Ok
staff /professional to assess irrigation system performance	ok
staff /professional to plan and implement modernization activities	High need
staff /professional to train on new approaches and methods for irrigation modernization	High need
staffs /professionals to train on new approaches and methods for crop water productivity improvement exist	ok
trainers are available to train on watershed management, and related themes	Ok
staff /professional to train on new approaches and methods for water balance/audit/ accounting	Ok
staff /professional to carry out piloting /testing activities	Ok
Training opportunities for national staff/Professionals exist on all relevant subjects (*see list below)	Partial
Training are regularly updated with new tools/methods	Partial
Training are carried out using knowledge sharing techniques	Partial

Learning objectives

3 key priority learning objectives

- More effective water resources development policies, strategies and investment frameworks
- Improved legal, financial and managerial capacities of professionals to improve the cost recovery and effectiveness
- Pollution control and improved re-use of water for agriculture

South Asia

To be completed)

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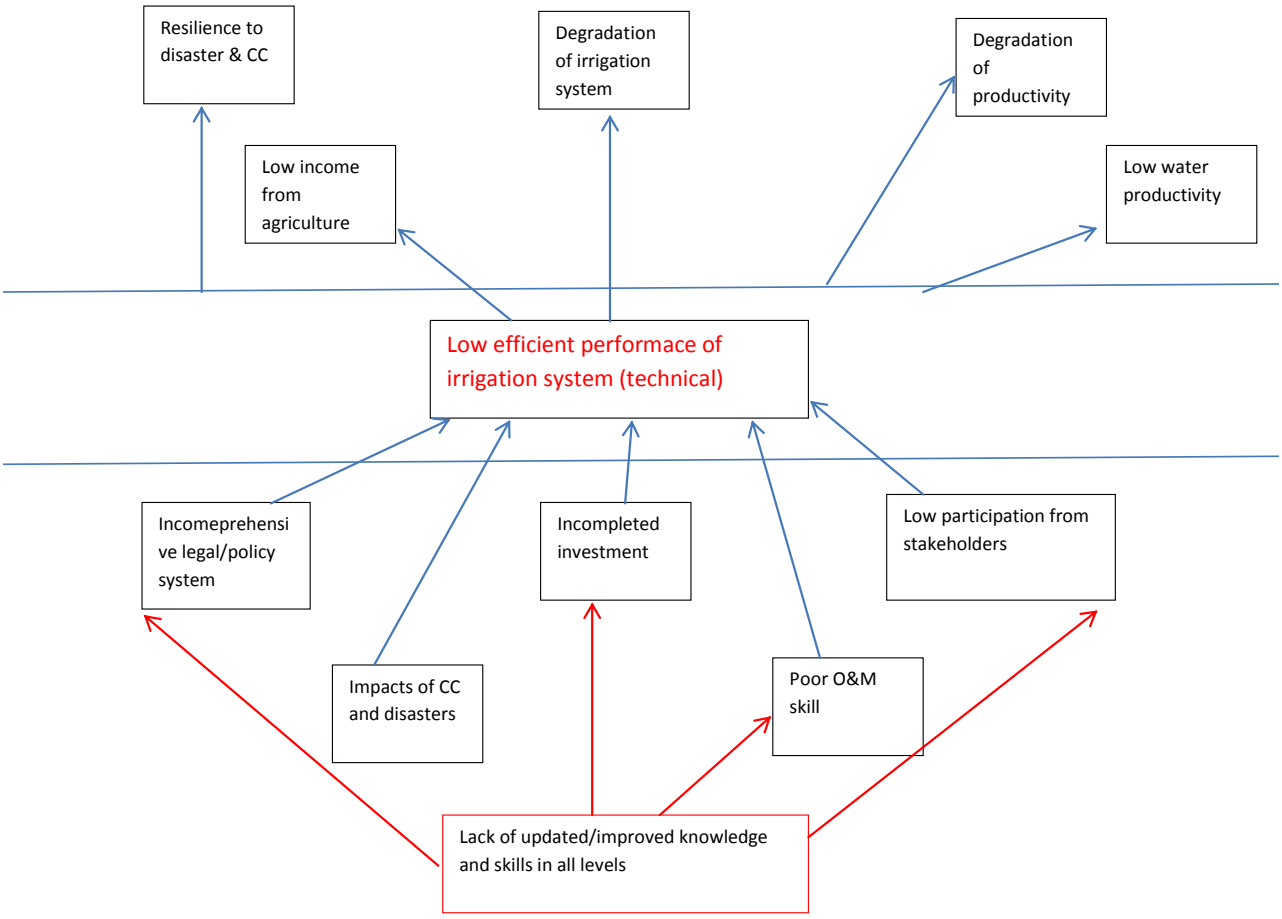
Vietnam

Problems and issues related to capacity development



OBJECTIVE LEARNING: Effeciency improvement of performance on irrigation system

Table 1- SITUATION of competencies

INDIVIDUALS	Existence and quality	capacity development needed (**)
staff /professional to manage irrigation systems	partially	Water Accounting; Masscote; RAP; modernization irrigation conceptualize
staff /professional to assess irrigation system performance	partially	Water accounting training framework
staff /professional to plan and implement modernization activities	partially	Irrigation Modernization Development Techniques
staff /professional to train on new approaches and methods for irrigation modernization	partially	Training of Trainers in Irrigation Modernization
staffs /professionals to train on new approaches and	partially	Water Accounting and Auditing

methods for crop water productivity improvement exist		Methods of Water Balance
trainers are available to train on watershed management, and related themes	Lack of well educated trainers	Build up to river basin-level management
staff /professional to train on new approaches and methods for water balance/audit/ accounting	Partially, in high management levels	Inter-Sector Water Demand Management
staff /professional to carry out piloting /testing activities	partially	Planning, design and implementing Pilot Projects
Training opportunities for national staff/Professionals exist on all relevant subjects (*see list below)	inadequately	4,6,78
Training are regularly updated with new tools/methods	Partially, not updated	Process to review Training Needs and Evaluation of Training Program
Training are carried out using knowledge sharing techniques	Partially	International cooperative training program

** example of capacities areas to be strengthened

17. Policy and normative capacities	18. formulate and implement policies
19. lead policy and legislative reforms	20. Technical capacities
21. Knowledge & know how capacities	22. create, access and exchange information and knowledge
23. Partnering capacities	24. initiate and sustain networks, alliance and partnerships
25. Implementation capacities	26. Planning
27. implementation	28. monitoring and evaluating
29. design	30. construction
31. Operation and Maintenance	32.

Table 2 – FUTURE NEEDS/REQUIREMENTS

List of priority by rder of importance

1. More effective water resources development policies, strategies and investment frameworks
2. Improve capacities of irrigation and water professionals in modern concepts, techniques and technologies (i.e FAO tools as Masscote...).
3. More understanding of public private partnership (PPP)

target groups for capacity development activites:

8. Student
9. lecturer /trainer
10. consulting firms
11. researchers
12. water users associations
13. farmers
14. general public

8 professional in water development
10 engineers / technicians
11 managers
12 policy makers

13 local institutions
14 extension workers
15 agronomists
16 communities
17 NGOs
18 all

Problems	What to be done differently	New capacities required to support them in their job?		Target Groups?
		(technical,	functional)	

Incomprehensive legal/policy system	National program on restructure management system	Complete data system, structure planning	Good understanding of laws, rules, regulations, governance, economics, finance.	Managers; policy makers; engineers / technicians;
Incomplete investment	Smart investment Conceptualizing modernization irrigation Application of new technology	Evaluate existing system; Planning and investment for future sustainably;	Control commercial or business budget for construction	consulting firms; professional in water development; engineers / technicians; managers; local institutions communities;
Poor O&M skill, Lack of updated/improved knowledge and skills in all levels	Training program,	Quantifying water use and quality, climate change, key performance indicators	Good understanding of laws, rules, regulations, governance, economics, finance. Risk assessment and management	all
Low participation from stakeholders	Focus on stakeholders at community level	Auditing, monitoring and evaluate; Decision making; PIM	Less based on government support	water users associations; farmers; professional in water development; engineers / technicians; local institutions; extension workers; communities

Malaysia

(to be completed)

Annex 3: Working group session (2) – Capacity Development Offer

This 2d working group discussed the offer available or missing to develop the skills and capacities requirements to support the proposed learning objective.

Guidance provided to the groups

1-Organization can be formal, informal, public, private, including nongovernmental organizations (NGOs and CBOs) and civil organisations (CSOs). They can also be a NETWORK if it does provide knowledge sharing and capacity development services.

2-Capacity development TYPE of offer can be:

advanced degree- university curricula	support to piloting new experiences
training, on the job-learning	facilitation of experience sharing
coaching/ mentoring	information / awareness activities
development of technical and functional skills	south-south cooperation agreements
knowledge generation	policy support
support to knowledge sharing	facilitation of organizational development
convening of national events	facilitation of managerial skills development
convening of regional events	creation of networks, twinning
Organization of share fairs	creation of study tours
facilitation of leadership development	fellowships
	Radio programs

3-target groups can be:

1. Student	8 professional in water development	13 local institutions
2. lecturer /trainer	10 engineers / technicians	14 extension workers
3. consulting firms	11 managers	15 agronomists
4. researchers	12 policy makers	16 communities
5. water users associations		17 NGOs
6. farmers		18 all
7. general public		

4-Thematic topics can be

- technical topics:

Irrigation modernization;	Environmental assessment;

Water accounting/balance ;	Health assessment;
Integrated water resource management;	Stakeholders engagement processes and participatory processes;
Multiple use systems;	Economical aspects;
Climate change adaptation/mitigation for agriculture	Legal/policy aspects
Stakeholder and Gender assessment	

-**functional topics**

Policy and normative capacities	formulate and implement policies
Lead policy and legislative reforms	create, access and exchange information and knowledge
Knowledge & know how capacities	initiate and sustain networks, alliance and partnerships
Partnering capacities	Planning
Implementation capacities	Implementation
Operation and Maintenance	Design
	monitoring and evaluating
	Construction

Central Asia

Table 1.a-learning objective in central asia

learning objectives	**list of thematic topics** that sustain the learning objective
Effective Water Deliver, WUAs development; distribution and implementation of FAO' instruments	Functional topics: Policy and normative capacities, Knowledge and know how, O&M, Implementation, Finance, Monitoring and Evaluation. WUAs establishment and development, conflicts resolution between local self-government, WUAs and district water Departments; O&M, assets management, Improvement of water resources management (water use, water accounting), business-planning, general administration and financial management at WUAs Technical topics: Water accounting and balancing, Indicators (stable and uniform/equal delivery, minimum unproductive, losses), Delivery scheduling, principles of allocation in periods of deficit of water/ rotation, accounting environmental issues, public involvement, Economic incentives, financing, infrastructure rehabilitation and development, SCADA, MIS. RAP и Masscote, CROPWAT, Aquacrop, FFS

Effective Water Use and Land Productivity; WUAs development; distribution and implementation of FAO' instruments	Functional topics: Policy and normative capacities, Knowledge and know how, O&M, Implementation, Finance, Monitoring and Evaluation, access and exchange information. between local self-government, WUAs and district water Departments; O&M, assets management, Improvement of water resources management (water use, water accounting), business-planning, general administration and financial management at WUAs Technical topics: Hydro module zoning, Irrigation rates, Irrigation scheduling, Water accounting and balancing, Indicators (more crop per drop, etc), water saving incentives, Soil fertility/bonitet, modern irrigation technologies and techniques. Economic incentives, land reclamation/drainage and salinity, agronomy, functional relations with WUAs and WMOs. RAP и Masscote, CROPWAT, Aquacrop, FFS Hydro module zoning, Irrigation rates, Irrigation scheduling, Water accounting and balancing, Indicators (more crop per drop, etc), water saving incentives, modern irrigation technologies and techniques, Economic incentives, land reclamation/drainage and salinity, agronomy, functional relations with WUAs and WMOs

Table 1b- Organizations with capacity development offers

ORGAN-IZATION	Regional coverage	Knowledge offer	Capacity development Offer
SIC ICWC	Tajikistan, Kyrgyzstan, Kazakhstan. WUAs' Union with Support Units across the whole country and with the training centre under the Water Research and Amelioration Department; Water Automation and metrology Design and construction Institute; Kyrgyz Research Irrigation	**Capacity dev objective**: Effective Water management, Land productivity **level targeted**: from end users (farmers) up to National water authorities and basin organizations **main thematic TOPICS**, see in Table above **main TOOLS offered**, network of Training Centres for water delivery topics, and Field Farmers Schools for farmers and WUAs for efficient water use topics and land productivity **Capacity Development TYPE**, trainings, consultations, extension	*Strategy for Extension Service Creation for effective water management and land productivity in Central Asia* was created by ICWC (Interstate Commission for water Coordination) and submitted to donors **Capacity dev objective**, Effective Water management, Increased Land productivity **level targeted**, from end users (farmers) up to National water authorities and basin organizations **main thematic TOPICS**, see in Table above **main TOOLS offered**, network of Excellency Centres for water efficiency topics, and Field Farmers Schools for farmers and WUAs for efficient water use topics and land productivity **CD TYPE**, trainings, consultations, extension service **TARGET group**: all key stakeholders and public in general

	Institute under the Ministry of Education; Kyrgyz Agrarian University; JSC Kyrgyz-suu-dolbor	service **main TARGET group)** all key stakeholders and public in general	
		ORGANIZATION MM&WR, NGO DEPAS Tajikistan **capacity dev objective**, Effective Water management, Land productivity **level targeted**, from end users (farmers) up to National water authorities **main thematic TOPICS**, see in Table above **main TOOLS offered**, network of Training Centres for water delivery topics, and Field Farmers Schools for farmers and WUAs for efficient water use topics and land productivity Capacity Development TYPE, trainings, consultations, extension service **main TARGET group**) all key stakeholders and public in general	Strategy for Water Sector Reform created by MM&WR and submitted to donors (Tadjikistan) capacity dev objective, Effective Water management, Increased Land productivity level targeted, from end users (farmers) up to MM&WR TJ main thematic TOPICS, see in Table above main TOOLS offered, network of Excellency Centres for water efficiency topics, and Field Farmers Schools for farmers and WUAs for efficient water use topics and land productivity Capacity Development TYPE, trainings, consultations, extension service main TARGET group) all key stakeholders and public in general

Gaps –

- how to do water accounting/measurement, knowledge on water resources management,, measurement especially at District levels and WUAs (transferred to their ownership recently) (proposal: FAO Tashkent can assist)
- Conveyance system by Govt
- There are 428 WUAs. WUA or Union needs to be trained - no well grounded irrigation module on the ground. Old modules need to be reviewed and updated. Training on financial management for WUAs. (response : use rural advisory service., training centres and departmental support for WUA.)
- The National Institute that does CropWat can do the training and piloting of irrigation system.
- At farm level, Kyrgyzstan, many farmers do not have adequate knowledge. All are dependent on international institutions.
- At field levels, there are Field Schools. There are many modules. FAO hope to play a leading role in these.

Table 2 a– knowledge offer versus needs

Levels	Learning topics	Target Stakeholders	International Knowledge center	Regional knowledge centers	National level Organizations offering knowledge and/or capacity development				
End users (Farmers)	Effective water use, Land productivity; WUAs development; distribution and implementation of FAO' instruments (FFS, CROPWAT) (technical topics)	Farmers, WUA staff	IWMI; FAO-Ankara	SIC ICWC and its national branches. WUAs' Union with Support Units across the whole country and with the training centre under the Water Research and Amelioration Department	National Water Resources Management authorities	Basin (Provincial) Water Management organizations	Canal Administrations + Local (province) government	WUA	Academic, Research and Design Institutions*) JSC Kyrgyz-suu-dolbor
WUA	Effective water use, Land productivity, Effective water delivery (functional and technical) WUAs development; distribution and implementation of FAO' instruments (FFS, CROPWAT, Aquacrop)	WUA staff	IWMI; FAO-Ankara	As above	National Water Resources Management authorities	Basin (Provincial) Water Management organizations	Canal Administrations + Local (province) government		Academic, Research and Design Institutions. JSC Kyrgyz-suu-dolbor; Kyrgyz Agrarian University
Main Canal System	Effective water delivery (uniform and stable water delivery, minimization of unproductive losses) . RAP и Masscote	Canal Administration staff, Union of water users, etc	IWMI; FAO-Ankara	As above	National Water Resources Management authorities	Basin (Provincial) Water Management organizations	Local (province) government		Academic, Research and Design Institutions

Basin (Provincial) Water Management organizations	Effective water delivery (uniform and stable water delivery, minimization of unproductive losses), M&O, new developments, RAP и Masscote, etc	Basin Administration staff, Union of water users, etc	IWMI; FAO-Ankara	As above	National Water Resources Management authorities				Academic, Research and Design Institutions
National Water Resources Management authorities	National policy and plans on Effective water delivery, Effective water use, Land productivity	Decision makers, technical staff, officials from other linked authorities	IWMI; FAO-Ankara; FAO-Kyrgyzstan	As above					Academic, Research and Design Institutions

*) TIIM, SANNIRI, Water Automation and metrology Design and construction Institute; Kyrgyz Agrarian University; JSC Kyrgyz-suu-dolbor, TajikNIIGiM, Kazgprovodkhoz, UzGIP, Turkmengiprovodkhoz, TjikGIP etc.

SUMMARY – Learning Initiative on Irrigation Modernization in Central Asia

In the framework of the Regional Initiative on Revitalizing irrigation and Agricultural Water Governance, at the launching workshop in Bangkok in March 2012, it was decided that FAO will support the formulation of a specific Learning Initiative on Agricultural Water Management in Central Asia. The engagement of Central Asia in this initiative offers a tremendous opportunity for this sub-region to share experience with other Asian sub-regions and, particularly, countries such as China who faced similar issues/constraints in a similar context 30 years ago and who can offer examples on how they have successfully addressed them.

The overall goal of the initiative is to contribute to 'Effective agricultural water governance for food security and livelihood improvement in Central Asia' while sustaining economic g initiative growth and addressing environmental sustainability.
In order to contribute to this development goal, it is considered to develop capacity on irrigation modernization across the three dimensions (i.e. individuals, organizations and enabling environment).
This objective will be mainly achieved by increasing 'knowledge capacities' for generating, field testing, disseminating and sharing knowledge. The capacity to engage in network and form partnerships will be carefully considered.
Some of the current targets include having
1. designed a comprehensive package of tools for each learning objective (adapted to the local conditions),

2. strengthened the capacity of key Organizations (e.g. government departments, professional institutions, irrigation management agencies and farming community), including the establishment of an accredited national centre of excellence, for each learning objective in each country,
3. developed the capacity of a national 'core team' of certified trainers and 4. established a network of regional knowledge centers of reference and national centres of excellence.

A broad stakeholder analysis is being carried out and the learning needs for each stakeholder are being assessed. The levels of intervention (have already been pre-defined, mostly on the basis of the collective support that can be provided by the regional knowledge centres (FAO/RAP, SEC and TCI; IWMI; ICBA; SIC-ICWC). The three priority countries are Tajikistan, Kyrgyzstan and, to some extent, Uzbekistan (based on formal requests from these member countries and the field presence of FAO). Countries such as China have also expressed an interest to facilitate exchange experience with professionals from Central Asia.

Table 3 - Capacity development for irrigation modernization in Central Asia

Levels	**Learning topics (draft)**	**Training tools**	**Stakeholders**	**Regional knowledge centers**	**National knowledge centres**				
					Kyrgyzstan (2)	**Tajikistan** (1)	**Uzbekistan** (3)	**Turkmenistan**	**Kazakhstan**
	Technical capacities								
Main system	irrigation modernization: assessment and planning	RAP MASSCOTE (and related tools)	Professional	FAO , ICBA, SIC – ICWC (2), IWMI					
WUA	Irrigation scheduling, flow monitoring , water accounting	CROPWAT,	Hydro-technicians of WUAs,	FAO, IWMI, SIC-ICWC					
WUA	Budgeting for O&M, business planning , Asset management,	WUA manual	WUA Directors and Accountants	FAO TCI/IWMI					

Field	FFS on land and water management	FFS modules	Farmers, ext. workers, WUAs	FAO ICBA/ICARDA , IWMI					
National	Financial analysis of irrigation investment	COSTAB, FARM	Economist, administrator	FAO/TCI					
National	Seasonal farm crop water management	Aquacrop	Professional academics	ICBA/ICARDA, FAO, IWMI					

Note:

- It is not reflected in this table but other organizations have expressed a concrete interest to join this initiative such as ICID & UNESCO IHE.

(1) **Tajikistan** proposed to consider the following institutions as national knowledge centres.

(2) **Kyrgyzstan** proposed to set a "center of excellence at national level". The Training Center at the Department of Water Resources and

	Name of organization	Name of Chief	Address	E-mail	Tel
1	NGO Development Partners Association (DEPAS)	Gafarov Bahrom	734017, Tajikistan, Dushanbe City, Rudaki Street 144, A44	gbahrom_75@mail.ru, depas.tj@rambler.ru	+992 927703346, +992 988438390
2	SIC ICWC	Gadoev Istamkul	Tajikistan, Dushanbe City, Shamsi Street 5/1	anvarkamol@gmail.com, tb_sic_icwc@mail.ru	+992 985268601
3	Tajik Scientific -Research Institute of Hydraulic Engineering and Melioration of Ministry of Melioration and Water Resources	Pulatov Yarash	Tajikistan, Dushanbe City, Shamsi Street 5/1		
4	Hydromelioration faculty of Agrarian University	Akramov Abdugafor	Tajikistan, Dushanbe City, Rudaki Street 146	akram_a51@mail.ru	+992935007928
5	SUE "Tajikgiprovodkhoz"	Nabiev Akbar	Tajikistan, Dushanbe City, Shamsi Street 5/1 41	nabievakbar@mail.ru	+992 934888831

the Union of WUAs could become the national centre of excellence, in partnership with: Planning and Design Institute "Vodavtomatika and Metrology" (PKTI VIM) with DWR, Kyrgyz Research Institute of Irrigation (KNIIIR) under Ministry of Education (MOE KR), Kyrgyz National Agrarian University (KNAU) named after Skryabin, "Kyrgyzsuudolboor" under the DWR, the World Bank, Asian Development Bank, UNDP, WFP, FAO, the Global Fund for Agricultural Development and Food Security, Japan (JICA), Switzerland (SDC), USAID, Helvetas, TSOKI, OSCE, EU, the Agency for Community Development and Investment (under the auspices of the Government of the Kyrgyz Republic), Rural Advisory Service, NGOs and private sector in rural areas. Contact details of the proposed institutions are as follows:

- Training Centre of the Department of Water Resources and the Union of WUAs/ Department of Water Resources and Melioration / Ministry of Agriculture and Melioration of the Kyrgyz Republic / 720055, Bishkek, Toktonalieva 4a. / Tel: 0096-312-54-90-95 / Tel: 0096-312-54-90-73 факс djailobaev1961@mail.ru/iskender1957@mail.ru/wmip-piu@wmip-piu.kg / Director of the Department of Water Resources and Land Reclamation: **Tashtanaliev Kokumbek Zhumagulovich**
- "Union WUAs" /720055, Bishkek, Toktonalieva 4a. /Tel: 0996-312-54-91-12 / Tel: 00996-312-54-91-08 - erkin@oip2.kg / 'ekojoev@mail.ru' /Chairman of the Union of WUAs Kyrgyz Republic **Kozhoev Erkin Imaralievich**
- Planning and Design Institute "Vodomatika i metrologiya" (PKTI VIM) /720055, Kyrgyz Republic, Bishkek, Toktonalieva St., 4a. / Tel: (+996 – 312) 54-11-50, Fax: (+996 – 312) 54-11-56 / E - mail: pkti@elcat.kg
- Kyrgyz Research Institute for Irrigation (KNIIIR)/ Postal address: 720055, Kyrgyz Republic, / Toktonalieva St., 4a / Tel: (996-312) 54-11-68; Fax: 54-09-75 / e-mail: kniiir@rambler.ru.
- Open Joint Stock Company (OJSC) "Kyrgyzsuudolboor" / Chuy Province, Kyrgyz Republic / Postal address: 720020, Kyrgyz Republic, Bishkek, Kamskaya St.,/ E-MAIL: ksd@netkey.bishkek.su /Tel: (996) (312)-543020, 543018 / Tel: (996) (312)--543025, / Fax-modem– 543029

(3) In **Uzbekistan**, the national knowledge centers were suggested

- ТИИМ – **Adress:** Republic of Uzbekistan, Kori-Niyoziy-39/ **Rector:**. Uktam Umurzakov / **Tel:** +998 (71) 237-09-45
- НИИИВП (Research Institute of Irrigation and Water problem) – **Adress:**Republic of Uzbekistan, 100187, Tashkent,Karasu-4/11 / **Director:** Rakhimov Shavkat. /**Tel:** (+99871) 265-32-41
- NBT – **Adress:** 14 Mavze Abdullaev, Suite 7, Yakkasaroy District , Tashkent 100100, Uzbekistan/ **Director:** Azim Nazarov/ **Tel:** +998-71) 253-3699

Remark: There were suggestions to select SIC ICWC (ICWC) as a regional center, which has offices in Central Asia. It was decided that the discussion on this issue would be continued in April 2013 in Manila (Philippines) at the meeting of the Coordinating Council, with invitation of the heads of ministries and other key organizations and members of the working group

China – Capacity development Offer and gaps

Overall Learning Objectives : Strengthen institutional capacity in irrigation modernization.

Gaps -
Short of suitable tools and methodologies
Irrigation Agencies need more staff training and Training for WUAs
Farmers training for operations and management
Cooperation Platform for knowledge sharing linkages ; International Orgs like IWMI can help in Basin Level Management.

Table 1 – Available organizations able to provide capacity development

Thematic topics	existence of relevant knowledge organization to provide capacity development
Irrigation modernization	✧ ORGANIZATION - WHU, China ✧ capacity dev objective- Strengthen institutional capacity ✧ level targeted- professional ✧ main thematic TOPICS-irrigation and drainage engineering, WSI, optimization of water allocation, O&M of pumping stations, water measurement technologies ✧ main TOOLS offered-irrigation operation strategy software, testing methods for pumps and pumping stations, groundwater management model ✧ Capacity Development TYPE- advanced degree- university curricula, training, on the job-learning, knowledge generation ✧ main TARGET group) – Student, professional in water development, engineers / technicians
Integrated water resource management -	**existence of relevant knowledge organization** ✧ ORGANIZATION - IWHR, China ✧ capacity dev objective- Strengthen institutional capacity ✧ level targeted-professional ✧ main thematic TOPICS- RB level water resource planning, water balancing at system level, appraisal and supervision of modernization investment projects, WSI, water saving equipment testing and certification, ✧ main TOOLS offered-system for diagnosis and decision making of irrigation scheme, ET-based water resources management, O&M software for irrigation systems ✧ Capacity Development TYPE- advanced degree- university curricula, training, on the job-learning, knowledge generation ✧ main TARGET group)- Student, professional in water development, engineers / technicians, policy makers

Table 2– Capacity development offer per level and target groups: offer

Levels	Learning topics	Target Stakeholders	International Knowledge center	Regional knowledge centers	National level Organizations offering knowledge and/or capacity development						
Gov Departments	Formulation of sector guidelines, standards, process and norms to realize gov. strategies and policies on irr. Modernization	Government staff	FAO, ICID, IWMI, GWP	AIT, FAO, IWMI, IRRI,	IWHR	WHU,	NCIDD,	TSU	CAU	HHU,	
Professional Institutions	Provision of suitable tools and methodologies on irri. Modernization Adjustment of university curriculums and training materials	Professionals	FAO, ICID, IHE, IWMI, IRRI, CSIRO	AIT, FAO, IWMI, IRRI,	IWHR,	WHU,	NCIDD,	TSU	CAU	HHU,	
Irrigation management agencies	Training on modernized operation and management	Irrigation managers	FAO, ICID, IHE, IWMI, IRRI, CSIRO,	AIT, FAO, IWMI, IRRI,	IWHR,	WHU,	NCIDD,	TSU	CAU	HHU,	Jiamakou
Farmers organization	Establishment of WUAs Improved operation and management of WUAs	Farmers	FAO, ICID, IHE, IWMI, IRRI, GWP	AIT, FAO, IWMI, IRRI,	IWHR,	WHU,	NCIDD,	TSU	CAU	HHU,	Jiamakou
Horizontal connection	Establishment of cooperation platform Centers of excellences (IWHR, WHU, JMK)	Irrigation practitioners	FAO, ICID, IWMI, IRRI, CSIRO, GWP	AIT, FAO, IWMI, IRRI,	IWHR,	WHU,	NCIDD,	TSU	CAU	HHU,	Jiamakou

Gaps to be filled

- Short of suitable tools and methodologies
- Irrigation Agencies need more staff training
- Training for WUAs and Farmers training for operations and management
- Cooperation Platform for knowledge sharing linkages ; International Orgs like IWMI can help in Basin Level Management.

Indonesia –Capacity development needs and offer

Table 2: review of existing capacity development Offer that could sustain the learning objective

Learning Objective: to ensure knowledge sharing on Irrigation Modernization among stakeholder at national-local level

Target Stakeholders : professional, decision maker, researcher, RBO, lecturer'

Type of Capacity Development	International Knowledge Center	Regional Knowledge Centers	National level Organizations offering knowledge and/or capacity development						
a. Training of Trainers	FAO, IWMI, Global Water Partnership (GWP), Stockholm International Water Institute (SIWI), UNESCO-IHE, International Water Center (IWC), IceWARM, ICID	AIT, ADB	Irrigation Centre, Centre of WR Research, MPW	Centre of Agricultural Climatology, MoA	Centre of Research and Development for Aquaculture, MoMF	Centre for Education and Training for Planner, NDP Agency/BAPPENAS	Center of Research and Development for local government, Ministry of Home Affairs	Gadjah Mada University and Bandung Institute for Technology	INA-ICID, HATHI, MHI, Indonesia Water Partnership, Indonesia WR Net, Indonesian Aquatic Association (MAI)
b. Workshop	FAO, IWMI, Global Water Partnership (GWP), Stockholm International Water Institute (SIWI), UNESCO-IHE	ADB	Irrigation Centre, Centre of WR Research, MPW	Centre of Agricultural Climatology, MoA	Centre of Research and Development for Aquaculture, MoMF	Centre for Education and Training for Planner, NDP Agency/BAPPENAS	Center of Research and Development for local government, Ministry of Home Affairs	Gadjah Mada University, Bandung Institute for Technology, and Bogor Agricultural University	INA-ICID, HATHI, MHI, Indonesia Water Partnership (KAI), Indonesia WR Net, Indonesian Aquatic Association (MAI)

Type of Capacity Development	International Knowledge Center	Regional Knowledge Centers	National level Organizations offering knowledge and/or capacity development						
c. Indonesia Water Week	FAO, WB, IWMI, Global Water Partnership (GWP), Stockholm International Water Institute (SIWI), UNESCO-IHE, JICA, KOICA, SIDA, ICID	ADB	Irrigation Centre, Centre of WR Research, MPW	Centre of Agricultural Climatology, MoA	Centre of Research and Development for Aquaculture, MoMF	Centre for Education and Training for Planner, NDP Agency/BAPPENAS	Center of Research and Development for local government, Ministry of Home Affairs	National Universities	INA-ICID, HATHI, MHI, Indonesia Water Partnership (KAI), Indonesia WR Net ()JSDA), Indonesian Aquatic Association (MAI)
d. Water Prize for Younger Professional	SIWI, FAO	ADB							
e. Facilitation of leadership	GWP	ADB							
f. Knowledge Management	FAO, IWMI, WB, ICID	ADB							
g. Fellowship	WB, UNESCO-IHE								
h. Study Tour	FAO, JICA, KOICA, SIDA								

Gaps

- To improve professional in latest concept
- To create access and exchange of knowledge (Indonesia Is very big)

Malaysia – Vietnam

Thematic topics to be considered

- Gap – Environmental, Health, vis a vis water resources, and Legal, Policy aspects
- Offer – includes irrigation modernization, water accounting, water savings modeling, IMT schemes, environmental assessment, policy issue.\
- Range of target users (students, WUA, engineers, system managers, planners, etc)

Table 1 – Needs and requirements

learning objective	list of thematic topics that sustain the learning objective
VIETNAM - Improvement of legal/policy system in agricultural water management	- building up irrigation law - lead policy and legislative reform: management restructures; - formulate policy and normative capacities
- SMART investment	Define prority in irrigation systems Completed investment from head works to on farm canal system; Apply innovative technology in designing and monitoring irrigation systems; Environmental concerns; M&E process; Effective auditing, accounting and evaluation
- Strengthening capacity for stakeholders	Building training programs for professionals (managers, engineers, and farmers); Technical capacities: O&M;Designing, Planning

Table 2- organizations with knowledge offer

ORGANIZATION	Thematic topic	Level	Target group	main TOOLS offered:	OFFER,
Vietnam Academy for Water Resources,	Integrated water resources management, Water saving irrigation, Land use and water resources management, water resources planning.	National level;	researchers; engineers; students(Msc; phD); technician, managers; farmers; decision makers; consultants; WUAs; professional in water development; local institutions; regional participants;	Irrigation Modernization, MASSCOTE, MASSMUS and FAO tools and methods, Water saving techniques, Modelling, PIM&IMT;	Master Degree on Water Resources Management (cooperation with Cologne Master Degree on Water Resources Management (cooperation with Cologne University of Applied Sciences, Germany); PhD program on Water Engineering, Water Resources Planning; Short courses (IWRM; Irrigation Modernization; Modelling; RAP; PIM; Disaster Management and Climate Changes; Coordinated Reservoirs Management; O&M; e-learning: ecological based disaster management (cooperation with IUCN; UNEP));

Malaysia NTAC, NAWMI					
Academy and University of Water Resources					Masters Degree, Water Engineering, IWRM, Modelling, RAP, PIM, O&M, eLearning, Disaster Risk Management (Target – Everybody!)
Malaysia institutions–					-Earth Observation Tools for planning and management or irrigation schemes; - Operation and Maintenance of irrigation systems for paddy; Water Resources and Hydrology, O&M Agric Drainage, Climate Change, WUAs water management.

OFFERS FROM MALAYSIA INSTITUTIONS

-Earth Observation Tools for planning and management or irrigation schemes;
- Operation and Maintenance of irrigation systems for paddy;

- To be operate and maintain irrigation system for paddy
- To be able to assess Water Resources and applications of hydrological tools
- To be able to plan, design and manage agriculture drainage system.
- To be able to operate and maintain agriculture drainage
- To be able to improve on-farm water management
-To be able to assess impacts and develop adaptation measures in irrigation water management.
-To be able to appreciate and plan for IWRM/IRBM
- To enhance Water User Association

Knowledge offer per levels and target groups

Levels	Learning topics	Target Stakeholders	International Knowledge center	Regional knowledge centers	National level Organizations offering knowledge and/or capacity development				
National	Irrigation Modernization, MASSCOTE, MASSMUS and FAO tools and methods, Water saving techniques, Water accounting, Water planning; River Basin management; Modelling, PIM&IMT	From national to local		(*) National center of excellences in Vietnam and malaysia	Vietnam Academy for Water Resources (*)	Vietnam: Water Resources University	MALAYSIA: National Agricultural Training center; National Water Management Insititute. (*)		
	Environmental Assessment (Malaysia)	From national to local							
	Health assessment								
	Legal/policy aspects								

Thailand

- Gaps identified include legal, financial capacity and cost recovery; pollution control and water re-use (and how to link these with the policy makers).
- Targets are policy makers
- In terms of offers, FAO has strong linked with RID, IWMI, many universities, AIT and consultants can be tapped.

Table 1 – thematic topics to be considered in capacity developmenmt

learning objectives	- **list of thematic topics** that sustain the learning objective
- More effective water resources development policies, strategies and	• Irrigation modernization; • Integrated water resource management;

investment frameworks	• Climate change adaptation/mitigation for agriculture • Stakeholders engagement processes and participatory processes; • Legal/policy aspects • Economical aspects;
- Improved legal, financial and managerial capacities of professionals to improve the cost recovery and effectiveness	• Irrigation modernization; • Integrated water resource management; • Climate change adaptation/mitigation for agriculture • Stakeholders engagement processes and participatory processes; • Legal/policy aspects • Economical aspects;
- Pollution control and improved re-use of water for agriculture	• Environmental assessment; • Health assessment; • Stakeholders engagement processes and participatory processes;

Table 2- knowledge offer per topic

Thematic topic	**Level**	**Target group**	**ORGANIZATION**
IWRM	Individual, river basin, national	Student, lecturer /trainer, engineers / technicians	AIT, Thailand capacity dev. objective: produce qualified water managers main TOOLS offered: curriculum Capacity Development TYPE: advanced degree- university curricula
			IWMI, Sri Lanka
Irrigation Modernization		Decision makers/managers	FAO, Thailand main TOOLS offered, MASSCOT, RAP Capacity Development TYPE, facilitation of organizational development
		Policy makers/managers	ICID
EIA/HA, Stakeholders engagement processes and participatory processes main TOOLS offered,		Decision makers/managers	KU/CU/MU, Thailand capacity dev objective, Knowledge generation Capacity Development TYPE, Curriculum/Training

Table 2bis – offer versus needs

Levels	Learning topics	Target Stakeholders	International Knowledge center	Regional knowledge centers	National level Organizations offering knowledge and/or capacity development				
National	More effective water resources development policies, strategies and investment frameworks	Policy makers/Decision makers	AIT IWMI ICID UNESCO-IHE	FAO/ADB/NARBO	Kasetsart Univeristy	Chula Univ.	Mahidol	Thammasart Univ.	Consultants
National and river basin	Improved legal, financial and managerial capacities of professionals to improve the cost recovery and effectiveness	Managers	AIT ADB	ADB	Kasetsart Univeristy	Chula Univ.	Mahidol	Thammasart Univ.	Consultants
National and river basin	Pollution control and improved re-use of water for agriculture	Managers	WHO AIT IWMI ICID UNESCO-IHE		Kasetsart Univeristy	Chula Univ.	Mahidol		

South Asia Group

- Strengths include SOM, IWRM, hydraulics (engineering), excellent universities in the countries who can provide technical expertise.
- Gaps identified on the policy – need to locate right institution to handle this.

Table 1- knowledge needs and potential offer

Learning Objectives:	**list of thematic topics** that sustain the learning objective	**Organizations/institutions to provide the knowledge**
- SOM	Irrigation Modernization	For IWRM Centre of Excellence KNNL

Learning Objectives:	**list of thematic topics** that sustain the learning objective	**Organizations/institutions to provide the knowledge**
	Water accounting/Water balance Share and benefits for multiple uses Environmental Assessment Economic aspect Assessment of Water resources demand situation Management of water scarcity at scheme and field level Stakeholders engagement processes Drainage	Stakeholders processes-WALMI (they need to strengthen their own capacity) FAO (Centre of Excellence) IHE-UNESCO (concepts) Business Management School - Indian Institute of Management (IIM, Bangalore) MUS – Indian Council of Ag Research (ICAR) INPIM – Nepal
- MIS	Automated canal and river flow gauging stations Automated data communication system Skills to analyse the data, produce the output and report to IRSA. Develop IRSA's capacity to forecast flow in each season (based on historical data) Automated gauging at each head cross regulator and communicate to SE and each head and Cross regulator for each main, branch, distys, and minors Communicate real time data to head of each canal system (SE).	Telecom companies. Service providers of the hard and software. Young technicians who can use the system, generate the output for decision makers (IRSA) NUST COMSATS
- Opera Conductor	Legal and institutional Framework on Smart water management Comprehensive data bank on soil water and agriculture Stakeholders engagement processes Performance assessment of irrigation and drainage system Benchmarking of irrigation systems Water resources management and planning IWRM OFWM	Universities engaged in water and engineering IWMI

Table 2- knowledge offer at various levels and for different target groups

Levels	**Learning topics**	**Target Stakeholders**	**International Knowledge center**	**Regional knowledge centers**	**National level Organizations offering knowledge and/or capacity development**

Levels	Learning topics	Target Stakeholders	International Knowledge center	Regional knowledge centers	National level Organizations offering knowledge and/or capacity development			
					Nepal	**India**	**Pakistan**	**Iran**
National	MU	Irrigation engrs. professionals, WUAs			IRCA (Nepal)			
National	INPIM	Engineers, WUAs			National (Nepal)			
National	Planning	Central and state engineers				National Water Academy (part of central water commission, ministry of water resources)		
State						WALMIs		
National		Staff of irrigation depts., public admin and academics[4]					NUST, istamabad	
National		Same as above					COMSAT	
National	IWRM	Ministry of Ag.						Iran water resources management authority
National	Hydraulics							Water research institute

[4] ministry of Water and Power, IRSA, federal flood commission
Federal Planning commission
Provincial planning and development dept.
Provincial and federal EPAs
Academicians
Provincial depts.. of Agriculture

Levels	Learning topics	Target Stakeholders	International Knowledge center	Regional knowledge centers	National level Organizations offering knowledge and/or capacity development			
National								Water and Power university
								Agriculture and Engineering Research Institute – IRAN
								Ag. And Extension services research centre –IRAN

International Group

Target Groups:

A – Policy makers/ Planners
B – Irrigation and Drainage professionals/related government agencies
C – Extension service providers/extension agencies
D – Water Users Associations
E – Individual farmers
F – Bulk water service providers/River basin managers/ agencies
G – Private companies
H – Regional Centers of Excellence

	Capacity Building Products on offer	Larger goal	Objective	Specific learning objectives	Target groups	Lead entity
1	MASSCOTE - Irrigation and drainage system modernization tool	Improved food productivity	Capacity building for revitalization of irrigation and drainage systems	• Initial rapid system diagnosis and performance assessment. • Quickly and systematically determine key indicators of the system to identify and prioritize modernization improvements. • Generate a baseline assessment, against which progress can be measured. • Modernize canal operation. • Facilitate service oriented management with specific identified targets in terms of effectiveness in relation to money, to water and with regard to the environment.	A, H	FAO
2	Regular/Short course on Service Oriented Management of Irrigation and Drainage Systems (SOMIS)	Improved food productivity	Capacity building for revitalization of irrigation and drainage systems	• Formulate policy objectives for irrigation development and management. • Gain insight to the laws, legislations, and traditions pertaining to the development and use of water resources for agriculture. • Identify water delivery arrangements including suitable flow control amenable to objectives. • Comprehend different levels of water delivery service and associated costs. • Conceptualize legislative, organisational and financial attributes of irrigation service delivery. • Draw up service agreements considering cost recovery and accountability. • Design asset management programs and action plans for implementation. • Devise monitoring & evaluation and benchmarking systems for assessing system performance.	A, B, F, H	UNESCO-IHE
3	Online course on Service Oriented Management of Irrigation and Drainage Systems (Online SOMIS)	Improved food productivity	Capacity building for revitalization of irrigation and drainage systems	• Formulate objectives for a typical irrigation and drainage system; • Describe different levels of irrigation service delivery. • Justify various water delivery systems; • Identify physical, economic, and institutional constraints to instigate appropriate measures. • Estimate associated costs. • Draft a service agreement between the service provider and the service recipient for implementing the service oriented management of irrigation system.	A, B, F, H	UNESCO-IHE

				• Propose a plan to monitor and evaluate the performance of the irrigation systems, including the indicators.		
4	UNESCO-IHE: E-campus learning platform	Improved food productivity	Capacity building for revitalization of irrigation and drainage systems	• Exchange knowledge and tools on an internet accessible learning platform related to improved management of irrigation and drainage systems	A, B, F, H	UNESCO-IHE
5	Training course on “Strategic planning and management of irrigation and drainage systems”	Improved food productivity	Capacity building for revitalization of irrigation and drainage systems	• Learn principles and procedures for strategic planning related to management of irrigation and drainage systems	A, B, F	FAO
6	Training course on “Automated channel control system”	Improved food productivity	Capacity building for revitalization of irrigation and drainage systems	• Manage, operate and maintain water control system in automated manners	D, F	RUBICON
7	Training course on “On-farm water management”	Improved food productivity	Capacity building for revitalization of irrigation and drainage systems	• Learn to apply the latest methods and techniques for on-farm water management suited to varied local conditions	C, D, E, G	IRRI
8	Training course on “Water saving technology”	Improved food productivity	Capacity building for revitalization of irrigation and drainage systems	• Learn to apply the latest water saving methods and technologies in varied local conditions	C, D, E	IRRI
9	Means for knowledge exchange and information dissemination among national irrigation and drainage	Improved food productivity	Capacity building for revitalization of irrigation and drainage systems	• Utilize the ICID network to effectively exchange latest knowledge and information related to improved performance of irrigation and drainage systems	B, C, D	ICID

	agencies					
10	National training course on "Water savings in irrigation"	Improved food productivity	Capacity building for revitalization of irrigation and drainage systems	• Able to describe and apply water saving methods in varied local settings	C, D, E	ICID
11	Training course on "Designing policies for managing transition in irrigation and drainage revitalization"	Improved food productivity	Capacity building for revitalization of irrigation and drainage systems	• Describe policy objectives • Explore alternative policy options, including their relative advantages and disadvantages • Contrast possible synergies and conflicts with contemporary policies promoted by various stakeholders	A	FAO
12	Training course on "River basin management"	Improved food productivity	Capacity building for revitalization of irrigation and drainage systems	• Critically assess the prevailing water sharing system • Identify the misfits • Conceptualize alternative plans and strategies • Develop optimal operational options	A, F	FAO + NARBO
13	Web-based platform for virtual learning, knowledge encapsulation, modeling, result dissemination for improved water governance	Improved food productivity	Capacity building for revitalization of irrigation and drainage systems	• Appreciation of systems approach • Express locally suitable approaches into global processes	A, F, H	eWater
14	Training of National Trainers on "Water demand management"	Improved food productivity	Capacity building for revitalization of irrigation and drainage systems	• Train the potential trainers at the national level in Central Asia Countries to be able effectively teach courses on "agricultural water demand management"	D	FAO, Ankara
15	Training of	Improved	Capacity building	• Train the potential trainers at the national level in Central Asia Countries to be	C, D, E	FAO,

	National Trainers on "Operation and maintenance of irrigation and drainage systems"	food productivity	for revitalization of irrigation and drainage systems	able effectively teach courses on "agricultural water demand management"		Ankara
16	Farmer-field training school on "land and water management"	Improved food productivity	Capacity building for revitalization of irrigation and drainage systems	• Train the farmers in Central Asia on "Management of land and water resources at local level"	C, D, E	FAO, Ankara

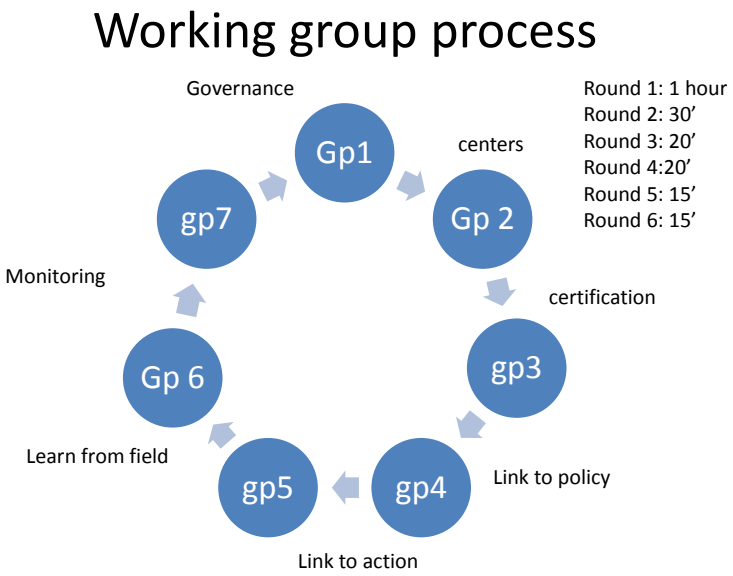
Annex 4: Working group session (3) Network and centres of excellence

Six groups were set to discuss the different aspects of the network and the centers of excellence. The outcomes of the different groups are provided thereafter.

	Group subject	Guiding questions	Facilitator/ Rapporteur
1	Governance of the whole network of centers	• Who and how: regulators and clients • Resources for establishment and sustainability • Making it happen: way forward	Robina Wahaj / Robert Carr
2	Centers of excellence: accreditation, modalities and efforts required	• MASSCOTE and other FAO tools: merge proposals W1 and W2 for Reference Centers? • Recognized Knowledge Centers: Centers of Excellence? • Confirming the initial set of Centers and their specific area of mandate • Reviewing the proposed modalities • Efforts required for accreditation • Resources for establishment and sustainability	Thierry Facon / Somasekhar Rao Polisetti

3	Certification of individuals for MASSCOTE and other tools	• Certification as a necessity? • Requirements for MASSCOTE and other tools • Modalities, targets and money	Daniel Renault / Peter Smith
4	Linking capacity development to policy	• Policy makers as target: how and what? • Policy makers as empowers: how? • Policy makers as guidance: what?	Zhijun Chen / Raza Farrukh
5	Linking capacity development to action: implementation and sustainability	• Reaching and attracting the clients • Mobilizing national capacities • Building into development and investment programmes	Domitille Vallée / Ir. Mohammad Zainal Fatah
6	Generating and sharing knowledge from the field	• Changing incentives for organizations and individuals • Organizing sharing • Users as capacity developers	Sangam Shrestha/ Pham Thi Phuong Thao
7	Monitoring and evaluation of process and impacts	• Selling capacity development • Checking effectiveness • Maintaining relevance	Ines Beernaerts / Herath Manthrithilake

The process that was used enabled all participants to contribute to each groups, except for the facilitator that was required to stay in its group throughout the process. The rapporteur was required to stay at least 2 rounds prior to shifting to other groups. The groups that took longer to start were the gp 1 and 2 as it took them time to agree on the main elements they would address.



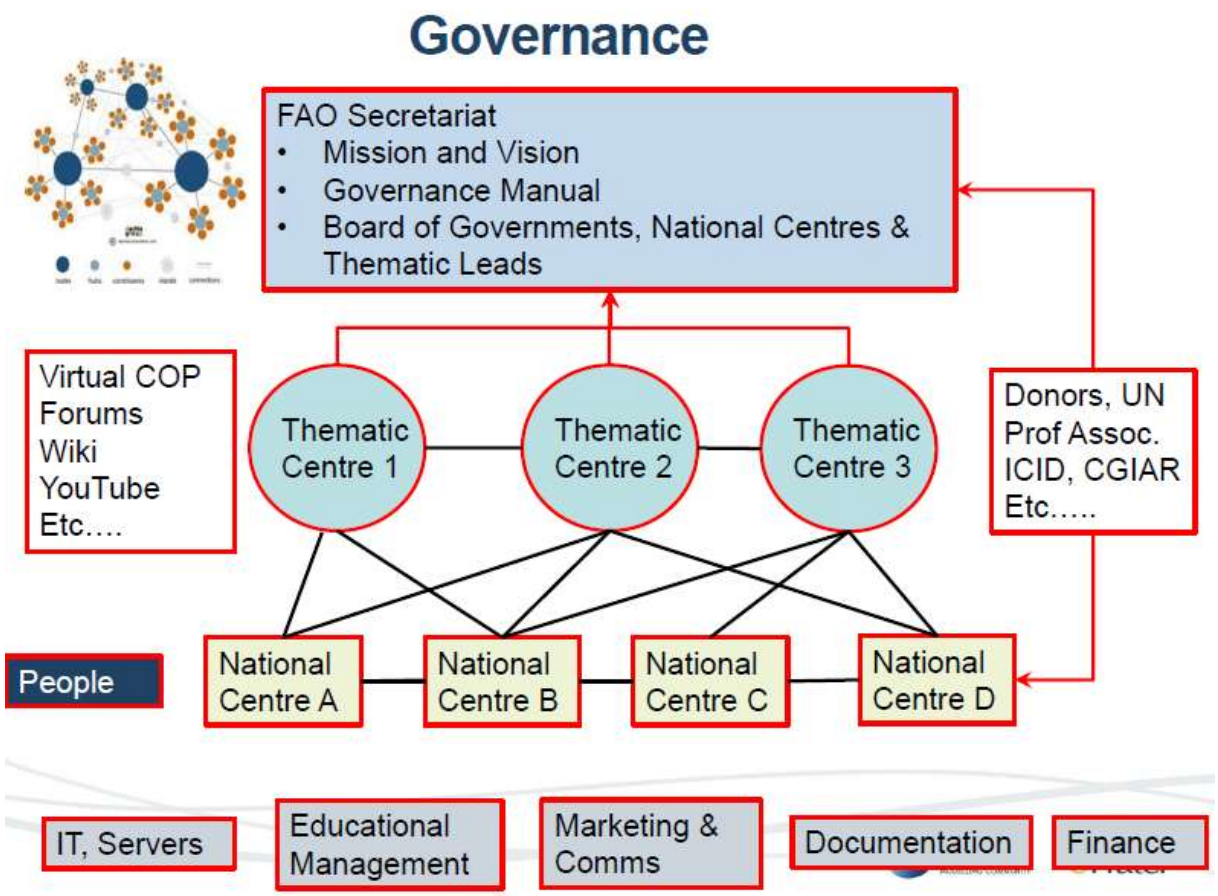
Group 1 – Governance of the network to strengthen capacities on agriculture water management

The governance of the network

The regional initiative proposes to set a network supported by a community of practice to support the revitalization of irrigation and agriculture water management. It will be based on a system approach with 1)"national centers of excellence" that have the capacity to do research, capacity development and have human capacities inhouse ; 2) virtual knowledge hubs that manage thematic knowledge and 3)nodes that favor exchanges across those hubs, 4)a network of individuals/experts/implementers (Graph 2).

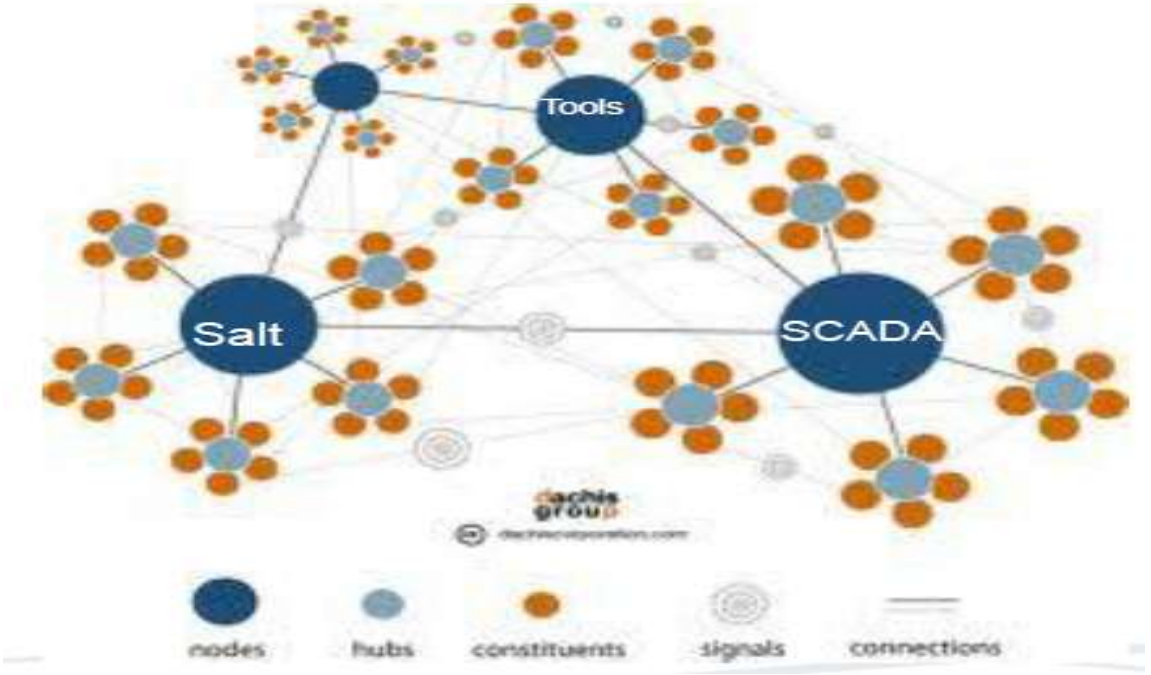
The overall governance of the virtual network will be coordinated from a secretariat at FAO supported by a board. Capacities will be delivered by national centers but coordinated by thematic centers (graph 1).

Graph 1 – governance system that structure the network



Community of practice to support Agriculture Water Management: That community will be built around "the thematic nodes" (virtual unit that take the responsibility for major themes- those nodes are facilitated by a knowledge center) and "knowledge hubs" that provide full support to constituents (the centers of excellence would take that role) and finally the constituents that are local delivery units (these constituents can be individual experts or local organizations). The system will be built on a quality assurance scheme (certification and accreditation schemes with network of centers of excellence) and supported by a business model. The central component of the community to function is "the conversation".

Graph 2 – the community of practices that sustain the network



Activities and Revenue/Support

•Agreement between National Centres and FAO regarding status, roles, participation in Thematic Centres and Accreditation (proposed 5 year period). Thematic Centres could be around both knowledge but also accreditation etc.

•"Internal" Financing of capacity building, training and knowledge products to WUA, Farmers, Irrigators covered by direct agreements/contracts at National Level

•Certification Services for a fee to Commercial Operators and Practitioners

•Educational and Training support to external clients as fee basis

•Capability delivered through National Centres but coordinated by Thematic Centres

Group 2 : Centers of excellence roles and responsibilities

Center of excellence offer – An initial set of national centers of excellence has been proposed by countries (those centers may offer their services at regional level). These centers based at national levels wll contribute to thematic knowledge at regional level.

Centers thematic focus

Table 1: National Knowledge centers (proposed centers of excellence)		**Thematic Focus**
AC IWRM	India, Karnataka	Integrated Water Resources Management (IWRM), Systems, Basins
VAWR	Vietnam	Water Resources Management, Disaster Risk Management, Climate Change, Land Use
IWHR	China, Beijing	Basin Management, IWRM, Water Saving Irrigation Technologies
WHU	China, Wuhan	Water Saving in Irrigation in paddy, Irrigation System Management, Pump and Pumping Station, multiple uses (MUS)
JMK	China, Jamaikou	Pump and Pumping Station Operations, Water User Assoc., Service Oriented Management
MADA	Malaysia	Planning, Design, Operation and Maintenance of Irrigation Scheme for Paddy, Managing Economic Transition (policy formulation, strategies and action plans)
SIC	Uzbekistan	Water Saving in arid climates

These centers are all first knowledge centers. They will develop tools for modernization AND capacity development with the aim to link to action. Most of them wish to use and train on MASSCOTE and other FAO tools.

If they respect standards and requirements for training on FAO tools, they will become “FAO Reference Centers”. These Reference centres will help countries to:

- Improve, adapt and simplify existing tools
- attract resources to the region
- allow expansion to other regions
- be focused on irrigation modernisation

- disseminate tools and methods more effectively
- increase credibility of national centres

Centres of Excellence (COE): Accreditation, modalities and efforts required

Guiding Questions	Response
MASSCOTTE and other FAO tools: merge proposals W1 and W2 for reference centres?	YES Adaptation and localisation of tools
Recognised Knowledge Centres: Centres of Excellence?	YES. Knowledge centres want to be recognised as CENTRES OF EXCELLENCE (CoE) CoE's will help countries to: - improve exiting tools - continue existing cooperations and projects with FAO - attract resources from somewhere else to the region - allow expansion to other regions - be focussed on capacity development towards irrigation modernisation - disseminate tools and methods mre effectively - increase credibility of national centres
Confirming the initial set of centres and their specific area of mandate	**CoE** — **Thematic Focus** AC IWRM — Systems, Basins VAWR — IWRM, Disaster Risk Management, Climate Change, Land Use SIC — Water Saving in arid climate, IWHR — Basin Management, IWRM, Water Saving in Irrigation WHU — Water Saving in Irrigation in paddy, Irrigation System Management, Pump and Pumping Station, multiple use JMK — Pump and Pumping Station Operations, Water User Assoc., Service Oriented Management MADA — Planning, Design, Operation and Maintenance of Irrigation Scheme for Paddy, Managing Economic Transition (policy formulation, strategies anf action plans)
Reviewing the proposed modalities	YES Will review governance setup

Efforts required for accreditation	Standards need to be set and agreed upon bench marking centres against standards assess research needed in which area – development of plans to achieve standard
Resources for establishment and sustainability	**Resources for establishment:** Physical Infrastructures Yes, exist in all CoE's Technical Capacities Needs strengthening (initial investments needed) Coordination Needed with reference to the central "Advisory" Board **Resources for Sustainability:** Business Plan Needed to sustain the CoE's Business Opportunities Providing services (consultancy, training, etc) Certifications with fees (trainers, practitioners, etc) **The business Model proposed for the network is a " Freemium"[5].** It ccontributes "public goods" to the knowledge platform with a "Business Plan": providing services as revenues, certification against a fee. Centres have government agreements. FAO accepts to farm out its capacity development on its tools to FAO references centres. Contribute to knowledge platform (public goods

Group 3 Certification of Individuals

Facilitator: Daniel Renault / **Rapporteur:** Peter Smith

Summary: Certification process for individuals on Irrigation Modernization. An initial proposal was made for certification on Individuals on MASSCOTE family of tools. It proposes three types of certification: 1) Participant (certificate of participation to training), 2) Practitioner (at least 3 MASSCOTE, one as a lead); 3) Trainer of practitioner (a lot of experience and a minimum of 5 MASSCOTE– 3 as lead)..

[5] **Freemium** is a business model by which a proprietary product or service (typically a digital offering such as software, media, games or web services) is provided free of charge, but money (premium) is charged for advanced features, functionality, or virtual goods. The word "freemium" is a portmanteau combining the two aspects of the business model: "free" and "premium".

Question: What should we be doing for certification for MASSCOTE and other tools?

General points:

- 3 levels of certification:
    - Participant
    - Practitioner
    - Trainer of Practitioners
- any individual who completes MASSCOTE is given a certificate of participation
- Practitioners and Trainers should be certified differently – individual should have to qualify eg. small test
- consultant companies should not be certified – certification needs to be for individuals. For example, if the person with capability leaves a certified company, who is able to do the skills?
- A Centre of Excellence can be responsible for Practitioner training in MASSCOTE – it may a business for them
- Who will issue the certification? – appropriate FAO Centre of Excellence
- Because MASSCOTE is publicly available, using certified practitioners cannot be enforced – so uptake will be demand driven

Practitioner:

- Requirements for a Practitioner:
    - Minimum 5 years experience in irrigation
    - Participated in minimum of 2 MASSCOTE processes (all 10 steps), each of 2 weeks
    - Must have completed at least one MASSCOTE without supervision – maybe by themselves, maybe with another (NOT a big irrigation scheme)
        - Calculations checked – by an auditor?
        - Alone – justified by examination of a jury made up of certified MASSCOTE trainers
    - Practitioner must have minimum basic skills eg. water accounting, economics, canal operation, etc. – may need to undertake training in these
    - May need to specify a minimum qualification eg. engineering degree

Important concern: Is MASSCOTE too big for just one person to be certified to do all steps?

Jury:

- made up of at least 3 people, 2 must be trainers, 3rd could be high level engineer in irrigation dept or professor (must be affiliated with the Centre of Excellence)

Certified Trainer:

- Must be a certified Practitioner
- demonstrated ability to train eg. 'Train the Trainer' qualification
- must have a lot of experience – completed at least 2 more MASSCOTE with no supervision, 1 must be in a different climatic region (Centre of Excellence to fund)
- at least 1 paper delivered on MASSCOTE at a national level
- final step is examination by jury

Problem for Trainers: How do you keep them in the system? Ie. moving to another job – perhaps family people, permanent employees, incentives like promotion or extra pay

Comment: Is this too complicated and might be unattractive to people?
Comment: Local qualifications and experience of practitioners should be taken into account for the certification (in Australia, this is through 'RPL' – 'Recognised Prior Learning')

Quality assurance mechanism:

- list of certified Practitioners and Trainers on FAO web site – for easy verification
- instate complaints mechanism for certified Practitioners and Trainers to Centre of Excellence and make widely known
- maintenance of certification – continual professional development eg. show development in any of the 10 topic areas contained in MASSCOTE
- certification must have global relevance

Group 4 - LINKING CAPCITY DEVELOPMENT TO POLICY

What is Policy? **VISION**
Who gives Policy ? LEADER(s)

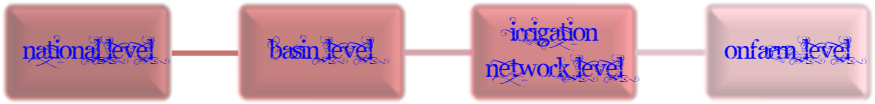
Political Leader (PL) **WATER MINISTER**
Administrative Leader (AL) **SECRETARY**
Technical Leader (TL) **CHIEF ENGINEER**

CAPACITY NEEDS

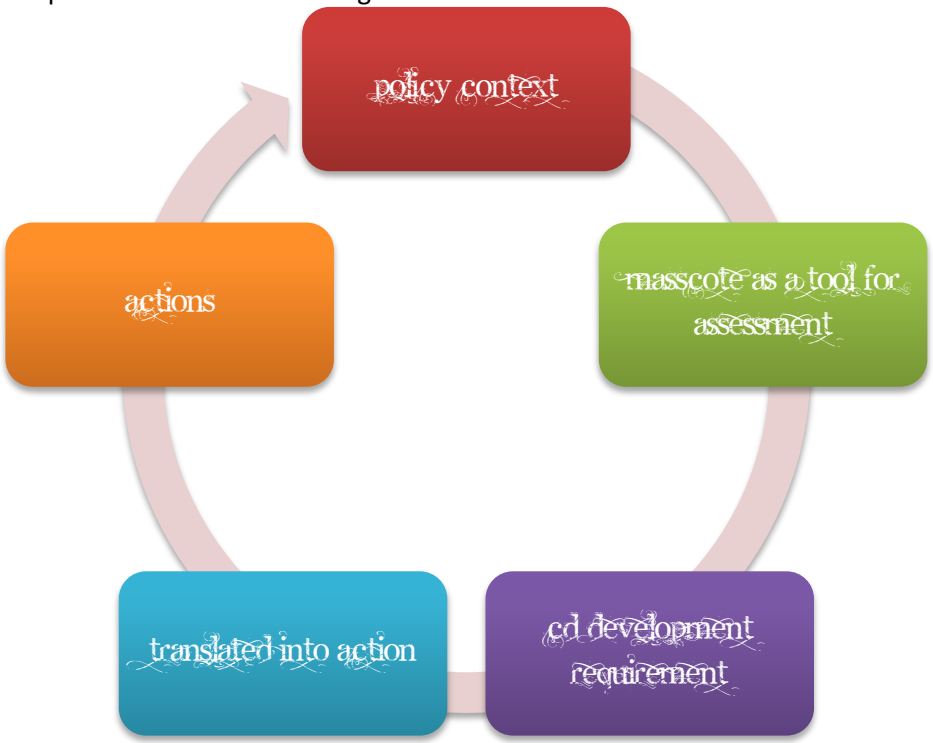
WHO	WHAT	HOW
PL	Sense of importance of sector vis-à-vis: • Impacts on Economy (micro and macro) • Poverty • Food Security • Good Governance • Legal Environment • Resource Allocation	• Exposure to international best practices/laws/policies. • Attend international and national seminar/conferences, particularly on water governance and laws
AL	Same as above plus understanding of: • Operation and management system of the sector Organizations/department • Key issues affecting performance • Human resource (policy) management issues • Institutional constraints • Financial Management • Good Governance	Same as above plus • Trainings on modernized irrigation management. - Strategic Management courses focusing on Irrigation Sector • 21st Century Human Resource Management - Smart incentives for Smart management • Frequent field level workshops involving stakeholders i.e. irrigation managers, field staff, farmers reps.
TL	Knowledge of: • Issues related to service delivery • Roles and responsibilities of irrigation managers • Inter-state sensitivities of shared rivers • Technical problems • Needs of managers vis-à-vis improving the operation and management • Legal Environment	• Short Term Training Courses • Workshops • Seminars • Conferences

Group 5 : linking capacity to action

Initial group members : Zhou Mingyao ; Yang Jingjing ; Chutinat Maliwan ; Cam Thi lan Huong
Mohammad Zainal Fatah (rapporteur) / Domitille Vallee (facilitator)



Think about the policy and local context when starting planning the capacity development to see where linkages can occur.



Setup Capacity Development at all level:

- Define need and gap for each level
- Ensure CD should be done for all stakeholders
- Meet the stakeholder needs
- Using systematic approaches

Define indicators of Outcome:

- less conflict on water allocation at farm level

- Information provide by farmers (situation and resources in the field) -→ farmers as **monitoring agents**
- Impact: increasing income level

Use multiple strategies to inform, raise awareness, and build capacity

- **INFORMATION** → internet-based tool for user
  - weather forcast, crop data (planting/harvest), water demand, water availability, GW level, canal condition, irrigation scheduling
- **TAILORED CAPACITY** → for each stakeholder to involve them in modernization.
- **ROLES and RESPONSIBILITIES**:
  1. Officer : record/document situation: water delivery,
  2. Farmers: is informed on technics to improve water use
  3. Manager: is informed on situation and need for modernization (money allocation)
  4. Extentionist/Facilitator: trained in water management and social skills
  5. Student: well prepared (capacity development strategies include in curricula)

Use a diversity of communication tools

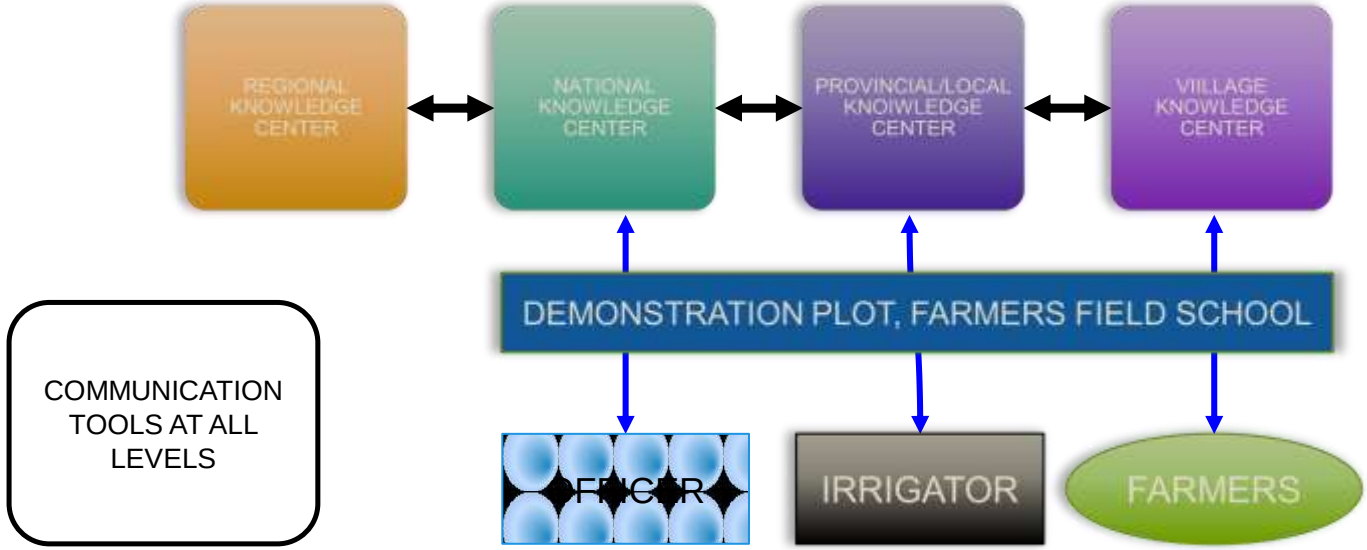
- Internet, TV, Radio, Mobile
- Information wall
- Libraries
- Guidelines, manual

Mobilize knowledge centers at different levels : clear roles and responsibilities

- Development of MANUAL/GUIDELINES for irrigator, facilitator, and famers
- National Knowledge Center (Nat KC) → trained/mobilized FACILITATOR to the field
- KC provide not only farming and irrigation information → market oriented farmer and trader
  - Crops price, crops production, technology availability,

Create a network of knowledge exchange cross institutions and individuals

- KNOWLEDGE CENTER



Where to start

- Where to start: RAP → needs/gap assessment
- Roadmap to reach the IMPACT in the grounds and key steps

- Funding arrangement

Requirements

- FUNDING:→ link to project on modernization
- FACILITIES
- INSTITUTIONAL SETUP

GROUP 6: GENERATING AND SHARING KNOWLEDGE FROM THE FIELD

I. **Changing incentives for organizations and individuals**

- Individuals level
    - Provide allowances/travel grant/uniform (dress code)
    - Explain benefit of use of data/information
    - Include part of technical performance evaluation - promotion to high level
    - Provide vehicles/ cycles/ mobile phones
    - Provide computers/laptops/internet
    - Provide simple data sheet to farmers

- Organization level
    - Provide fund (organization) to collaborate with other partners
    - Training for data collection (advanced methods)
    - Competition among WUAs and provide prizes (vehicles, machinery, tools…)
    - Enroll in the collaboration with other rehabilitation projects
    - Provide technical study tour

II. **Organize/share the knowledge**

- How to organize the knowledge
    - Computer (storage)
    - Internet
        - Website

        - Linkage with local government officer
    - Database format to all the data/information

- Hot to share knowledge
    - Field trip (policy makers/managers/farmers
    - Workshop/seminars
    - E-discussion
        - Website
        - Social network – official (FB, line…)
    - Centre of excellence (as organization)
    - Database of solution/case-studies
    - Bulletins, leaflets (in local language)
    - Mass media (TV, radio)
    - Experts consultations
    - Learning alliance
    - Full cropping season demonstration of proven technologies on farmers field

III. **Users as capacity developers**

- Dissemination of knowledge by farmers to farmers
- WUAs as a model of capacity developers for other WUAs
- Invite as speakers in workshop/seminar
- Invite as guest lectures
- Documentation of success stories and use them as guideline
- Case studies
- Farmers field school/ field trip/meeting in field

Group 7 Monitoring and evaluation of the process and impacts of capacity development

(Facilitator: Ines BEERNAERTS)

Individuals

Monitoring :

How do we measure changes in individual capacities?

How would certification of individuals (e.g. participants, practioners and trainer of practioners) affect the changes (e.g. behavior)? +

- Increased knowledge (including indigenous) of new practices/technologies/approaches
- Higher an diversified experience, with better understanding of the constraints and possible actions
- Improved skill levels (including participatory training skills for trainer of practioners and communication skills to peers and other stakeholders)
- Better attitude / confidence+, increased motivation +
- Act with more responsibility -Clearer understanding of job requirements (clear job description)
- Increased degree of dedication towards the host Organization

Impact:

Improved overall performance +: fulfillment of pre-defined tasks (can be measured by doing a capacity needs assessment, task analysis, performance appraisal)

Data sources: KAP survey to staff (LM2 – Tool 13)

Remark: Capacity development (particularly, a task analysis) could be carried out as a last step MASSCOTE in order to inventory, classify and break-up the tasks and identify the kind of knowledge, skills and attitude required for the tasks.

Organizations

Monitoring :

How do we measure changes in organizational capabilities?

How would accreditation of institutions affect the changes (e.g. institutional capabilities)?

- Hosting organizations and people's organizations improve their capacity to formulate and implement actions on irrigation modernization.Adequate budget and human resources allocated to support actions
- Organizational mandate, priorities and objectives improved
    - Increased relevance of the mandate (change in the structure of the organization). For instance, appointment of a new officer (e.g. Climate change) to adopt a more pro-active climate risk-based disaster management approach or appointment of a gender officer to mainstream gender in the mandate of the organization (provide equal rights & opportunities). ++

- Increased outreach and targeting of the service providers (e.g.number of people reached, number of women and vulnerable households receiving services, geographical coverage)

Planning processes improved
Work plans/irrigation modernization plans developed

Internal organization, coordination, management and teamwork improved

- Quality and efficiency of team work improved
- Reduced staff turnover (incentives/reward mechanisms for individuals) and lower average age of staff
- Continuous transmission of knowledge within the Organization

Increased access to information and improved knowledge sharing between organizations

- Membership in networks / number of partnership agreements ++
- Increased credibility of the Organization+

Impact:

- Increased effectiveness of the Organization: linked to the mandate / productivity (quantity, quality, time and cost). E.g. Increased number, type and quality of training events / advisory services (carried out / provided by certified trainers of practioners)++
- Data sources**:** Interviews with staff of the hosting organizations; report of the organizations

Evaluation -How do we measure impact of capacity development?

Relevance:
Alignment with strategies, policies and priorities of the irrigation sector (i.e. direct contribution to its development objectives)
Satisfaction of the needs of individuals (e.g. current and future tasks) and organizations (e.g. mandate and functions)

Efficiency:
Achievement of a set of expected outputs within time and budget. Ex: workshop.

Effectiveness:
Appropriateness of methods/approaches used to change competencies of individuals (mindset) and organization capabilities (mandate)

Sustainability:
Ownership, leadership, partnership, demand creation

Data sources: interviews/focus group discussions, satisfaction surveys to assess the strategic importance (relevance, efficiency, effectiveness, sustainability) of the CD support provided, which should form integrated parts of the satisfaction score (0 to 100 %). Example : Report on satisfaction assessment of capacity development on irrigation in Kyrgyzstan (FAOSEC).

Enabling environment

Expected changes in the enabling environment which may influence, sustain, enable or disable the use of certified individual competencies and accredited organizational include : policies, vision, budget sector allocation (national) and other external resources allocation.
Remark: SMART indicators could still be further developed

Annex 5: Working group session (4) work plans for FAO and proposed centres of excellence

1- Governance Network / (FAO) secretariat

Next Steps:

- Revised Concept Note
  - Overall governance set up
  - TORs and modalities for CoE
  - M&E of the secretariat and the whole process
- Feedback from partners and CoE
- Creation of space for interaction
  - web-based, social media
  - At the start FAO will take the lead and provide this space. Later on partner(s) could take over and manage it
- Communication with the potential donors and Governments
  - Manila during ADB water week in March 2013
  - Asia Pacific Water Summit in May 2013
  - World Irrigation Forum in September 2013
- World Irrigation Forum, September 2013
  - Progress monitoring
  - Communication
- Develop Accreditation and Certification Criteria

- For CoE
- For programmes and courses offered by CoE
- Individuals

- Business Plans
  - Minimum 5 years, preferably 10 years
  - Freemium for premium – sell premium for funding internal free services
- Funding
  - Start immediately with what is available, then seek more
  - FAO has proposed this initiative to be included in the strategic plan of the next biennium (2014-2015)
  - FAO has plans to find additional money for 2013
- Expand to other regions and countries

Specific Activities:

- MASSCOTE 2.0
  - Build prototype – by July/August 2013
  - Test prototype – August-October 2013

    Involve CoE and experts
- Certification process of the individuals on MASSCOTE
  - Identify experts
  - Training of experts
  - Set-up committee for certification
  - Set Standards

    Iterative process
    Back-up support – International, Regional, National
- Dissemination of the tools and methodologies and preparation of training material
  - 20-30 minutes movie on different MASSCOTE steps – translated in different languages. Iran volunteers.
  - Standard training packages on MASSCOTE Steps, etc.

2- India-Karnataka -Roadmap of the Center of Excellence in South Asia

Theme: IWRM

Location: Karnataka, India

Status: Already established by government as independent organization with allocated financial resources for: 1) Infrastructure development [15 MUS$] and 2) For program costs (local) [3MUS$].

For 2013:

1. Mobilization of national experts
2. MASSCOTE in two irrigation systems (Gondi and Vijaynagar Channels and Tunga Bhardra Left Bank Canal [TBLBC]) for irrigation modernization (June / Sept)
3. Mobilization of international experts
4. Initiate river basin planning in K-8 sub-basin
5. Explore options for data information system
6. Await accreditations standards from FAO – discuss and agree
7. Certification of individuals
8. Accreditation as FAO reference center
9. Discuss with e-water for partnership

Note: there is also a project led by IHE delft related to accreditation of capacity development on IWRM.

3- Malaysia- Centre of Excellence for Irrigation Modernisation for Rice Production

Theme: modernization of rice production

YEAR		2013												2014											
ACTIVITY		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
1	Cabinet Approval																								
2	Establishment of CoE																								
3	Identification of Training Modules																								
4	Strengthening of Training Modules by experts																								
5	Identification of Target Groups																								

6	Identification of Trainers																								
7	Development of Training Programmes																								
8	RAP and MASSCOTE i. Kerian Irrigation Scheme ii. KADA																								
9	Training of Trainers on MASSCOTE																								
10	Training of Trainers on Irrigation Modernisation																								
11	Evaluation of Training Programmes																								
12	Certification and Accreditation of Trainers																								
13	Certification and Accreditation of CoE																								

A. Potential National Partners (initial list)	**Focus Area**
i. Department of Irrigation and Drainage Malaysia	Integrated Water Resources Management Integrated River Basin Management
ii. Department of Agriculture Malaysia	
iii. Muda Agricultural Development Authority (MADA)	Operation and Maintenance of Irrigation Schemes
iv. National Hydraulic Research Institute of Malaysia (NAHRIM)	Climate Change Adaptation and Mitigation
v. Malaysian Agricultural Research and Development Institute (MARDI)	
vi. Institutes of Higher Learning	
vii. National Agriculture Training Centre. Ministry of Agriculture and Agro-Based Industry	
B. Potential Regional Partners (initial list)	**Focus Area**
i. IWMI	
ii. IRRI	
iii. AIT	
iv. Royal Irrigation Department, Thailand	
v. Ministry of Public Works, Indonesia	

	C. Experts/Modules Needed (initial list)	**Source**
i.	Irrigation Modernisation	FAO,
ii.	Water Saving Technology	Wuhan university, IRRI, IHE,
iii.	Green Agriculture	IHE,
iv.	Water Accounting	IRRI, IWMI, AIT
v.	Risk Management in Agriculture	
vi.	Participatory Irrigation Managaement (PIM)	IWMI
vii.	Numerical Modelling for Irrigation Water Management	eWater CRC

4-China – Roadmap on the establishment and functioning of Centers of Excellence

Three centers are proposed as centers of excellence.

1- **IWHR: Institute**
2- **WHU: Academic**
3- **JMK: Scheme level**

Year	Actions
2013	✧ Propose subjects and expertise which can be offered ✧ Submit to the Gov. and Regional Secretariat for review and approval ✧ Confirmation of subjects and expertise and processing of formal certification
2014	✧ Preparation of operation plan for each centre ✧ Preparation of modules, methodologies and training materials in line with the confirmed subjects and expertise for the purpose of domestic and regional training, technical services ✧ Negotiate and sign training/service agreements with national and regional clients ✧ Mobilize resources from clients, government and donors ✧ Establish national and regional demonstration system and Farmers Field Schools for Water user associations training Station at JMK
2015	✧ Implementation of regional and national training/service agreements ✧ Building partnership with other regional and national centers ✧ Establishment of a joint web-based platform

5-Central asia

Road map – Central Asia

Main activities

1. A series of training workshops carried out for 16 professionals on irrigation modernization in Tajikistan (12 participants from Tajikistan, 2 participants from Kyrgyzstan and two participants from Uzbekistan) in order 1. to support the implementation of the water sector reform in the country and the development of the field programme on irrigation modernization in Tajikistan and 2. to train future potential trainers on irrigation modernization from key institutions of the sub-region.

- Detailed road map and budget drafted in March 2013
- List of potential national centres of excellence compiled for Kyrgyzstan, Tajikistan and Uzbekistan in March 2013. Action: SEC/HQ
- One irrigation system selected in the South of Tajikistan (based on a set of selection criteria) in March /April 2013. Action: MWRLR/HQ.
-
- Participants selected in March/April 2013. Action: SEC
- One week training workshop on the performance assessment of irrigation systems ('Rapid appraisal procedure') in May 2013. Action: SEC/HQ/FAOTAJ Budget: 19,000 USD
- One week training workshop on MASSCOTE in June 2013. Action: SEC/HQ/FAOTAJ. Budget: 19,000 USD
- If budget permits, one week training workshop on MASSMUS in September 2013 (if additional resources can be mobilized). Action: SEC/HQ/FAOTAJ

2. A 'Central Asia Learning Initiative on Irrigation Modernization' launched to develop national capacity on irrigation modernization in Tajikistan, Kyrgyzstan and Uzbekistan

- Questionnaire on capacity development finalized in Russian in April 2013. Action: SEC/HQ
- Survey (capacity needs assessment) carried out and learning objectives defined in April 2013. Action: SEC/HQ
- Potential national centres of excellence (2 min – 3 max) selected in May 2013. Action: SEC/HQ
- Concept note 'Learning initiative on irrigation modernization for Central Asia' submitted, endorsed by all key partners and resources mobilized in June 2013. Action: SEC/HQ

3. Awareness of Central Asian decision-makers raised on irrigation modernization

- Workshop proceedings provided to SIC-ICWC in March 2013. Action: HQ
- ICWC members briefed on on-going regional initiative on irrigation modernization in Asia-Pacific (next ICWC meeting) in April 2013. Action: SIC-ICWC/SEC

Other activities

4. Training modules on drainage / salinity management (e.g. MASSCOTE, AQUACROP and FFS) developed and field tested within Central Asia in partnership with ICBA in 2013/2014. Specific activities will be further discussed and defined during the launching of the Regional Soil Partnership for Eurasia in Moscow in May 2013. Action: FAOSEC
5. Thesis from IHE-Delft students carried out in the framework of FAO projects on irrigation modernization during the summer period. Action: FAOSEC
6. Exchange of experience on irrigation modernization with China (field visits in Western China). Action: FAOSEC/FAORAF

5-Vietnam – Roadmap for the Center of Excellence

Introduction of Vietnam Academy for Water Resources (VAWR)

Overview

Vietnam Academy for Water Resources (VAWR) is one of the Vietnam' leading Institutions in water resources science and technology, it is special ranked in accordance with the Decision 594/QD-TTg's Prime Minister on May 10 2007. Established in 1959, after more than 50 years of construction and development, the Academy now wearing a new appearance with modern facilities and scientific workforce, strong technology with over 1,500 staff of which: 28 professors, associate professors, 01 Science Doctors, 65 Ph.D, 267 masters and more than 1000 Engineers, Bachelors. The Academy also owns modern laboratories in key areas of country.

During its history of development, in any circumstance, the Academy has always actively and importantly contributed to the country' socio-economic development course. In the early years of economic recovery, the Academy proposed research projects on construction and upgrading of North Hung Hai Irrigation system, Do Luong dam and North Nghe An irrigation scheme, Day dam, Van Coc dam, Thac Bac hydropower. These hydraulic structures were large size, complex technique at that time. After the country unification, the researchers of the Academy implemented land reclamation for acid, salty soil, they also involved in building a number of hydraulic structures on the soft ground, which contributed to the largest granary of the country as it is today - the Red River and Mekong Delta.

In recent years, scientific research results of the Academy have proved in erosion prevention, river and sea bank protection, disaster reduction, salinity intrusion, environmental protection, irrigation modernization, irrigation systems operation, hydro power and climate change adaptation. Many new technology have been applied and brought their outstanding outcomes such as: Pier lifting barrage, movable ferry-style dam, rubber dam, soil cement pile, beams technology, water saving technology, SCADA, hydraulic pump, physical model, spillway, decision support system (DSS) in water resources management, policy and institution in in irrigation management… Also, since 1979 VAWR has been assigned by the Government to provide training for PhD with 7 specializations and services for MSc and short courses. The Center for Training and International Cooperation (CTIC) has been assigned as the focal point for training coordination, management and international cooperation.

With the current position and potential, VAWR does not cease to develop to deserve a leading research institution of science and technology in water resources of the region, towards catching up with developed countries in the world in 2030.

The Academy appreciates support and cooperation of organizations and individuals inside and outside the country with the desire to maintain and develop the relationship on the principle of "cooperation for development and mutual benefit".

Functions and Mandates

Functions:

- Science research
- Technology transfer
- Post graduate training
- International cooperation
- Consultancy services and construction on hydraulic, hydropower and environment.

Mandates

- **Provide advices** MARD in term of national strategy, programs, plans, technology and management of irrigation, hydropower, environment, prevention and mitigation of natural disasters and adapt to climate change.
- **Provide scientific foundation** for planning socio-economic development throughout the country and territories; institutional development policies, economic and technical norms on water, environment, construction, management, operation of irrigation structures, equipment, hydropower.
- **Research and advanced technology transfer** serving production, national security and defense, disaster reduction and climate change adaptation.
- **International Cooperation and Training** high-level human resources and
- **Produce**, doing business and import and export in accordance with the national law.

The need to set up the Center of Excellence

Opportunities

- Serving sustainable agriculture production and food security is one of the most important targets the Government. MARD is focusing on "Agriculture Restructure: Sustainability and Added Value", in which showing that Viet Nam should keeping putting effort to maintain agriculture and rural development. It's necessary to have an adjustment towards improving value added and sustainability in order to both maintain the economic growth and meet the requirements of society and the environment. Therefore, priorities should be given to policy reform, public investment restructuring, private investment, PP development, institutional reform and State management method reform for more effective Agriculture development, deeper integration, better adaptation to the impacts of climate change and the fluctuations of global economy.

- At present, MARD is developing and submitting to government to approve National Program on "Improving exploitation efficiency of irrigation system" to ensure quality of service, sustainable agriculture development,…including following solutions: (i) Completing the institutional and policy system; (ii) improving management and organization capacity of irrigation system; (iii) Promoting research, science and technology transfer and application on irrigation system management and operation ; (iv) training to improve human resources; (v) Modernizing(complete) irrigation structures, especially for system without canals... Therefore, there is an urgent need for training to improve capacity of stakeholders: i) Management; (ii) Exploitation and operation; (iii) Water users… to meet above orientation;
- In the mater plans of irrigation development in Vietnam, there will no more new irrigation system be constructed, just focus on rehabilitate and modernize existing schemes. In the other hand, ODA funded projects from WB, ADB, JICA… in terms of irrigation system improvement is applying modernization-oriented approach such as (i) "Irrigated Agricultural improvement-WB"; (ii) "North Nghe An irrigation system restoring and upgrading -JICA"…In these projects, need for training Modernization, O&M,PIM…for stakeholders and VAWR helps to establishing the program and training plan for these projects;
- The high demand on training on irrigation management is increasing not only in Vietnam, but also in the region. With the role and the development strategy of VAWR, it is a very big potential to provide training services and irrigation modernization in particular not only in Vietnam but also in the regional countries. In the other hand, through its partners such as JICA, FAO, WB, ADB… and networks, VAWR could expand providing training to another countries in Africa for instant through bilateral cooperation programs (South-South cooperation...

Strengths

- VAWR position in the field of water resources is an advanced Vietnamese organization which is responsible for scientific research, training and international cooperation regarding irrigation system and it is upgraded to regional level through the project to establish Regional Training Center (RTC)
- Key persons from VAWR are trained in terms of Irrigation Modernization, RAP, MASSCOTE, MASSMUS…
- VAWR provided training service regarding Modernization, RAP, MASSCOTE, MASSMUS… in projects of WB, ADB…
- VAWR had a good facilities for training on modernization in Hanoi (funded by the WWB) and in the near future, with the funding from JICA, a new Training Center of VAWR will be constructed in Hoa Lac (20 km from Hanoi) with sufficient and modern facilities for training.

Weaknesses

- There are few key persons mastering Modernization. To take opportunities and meet training need, improving lecturer capacity of VAWR in this field is very urgent.
- There is not standardized document files regarding training Modernization yet.

Action plan

ACTION PLAN

Order	Activities	Year 2013												Year 2014												Year 2015											
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
I	**Setting up the Center of Exellence**																																				
1	Cabinet Approval																																				
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11	Evaluation of Training Programmes																																				
12	Certification and Accreditation of Trainers																																				
13	Certification and Accreditation of CoE																																				
II	**On-going MASSCOTE/MASSMUS applications**																																				
1	MASSCOTE for Phu Ninh irrigation system in Quang Nam province, Vietnam (WB)																																				
2	MASSCOTE for Ke Go irrigation system in Ha Tinh province, Vietnam (WB)																																				
3	MASSCOTE for Gia Binh model site, Nam Duong irrigation system in Bac Ninh province, Vietnam (ADB)																																				
III	**Plan of Training for NNA project**																																				
1	Irrigation system modernization																																				
2	RAP with MUS/LIS module																																				
3	MASSCOTE/MASSMUS																																				
4	Benchmarking																																				
5	IMC managerment planning																																				
6	Water measurement																																				
7	SCADA																																				
8	Operation and Maintenance																																				
9	PIM																																				
10	……..																																				

Potential Partner

Potential National Partners (initial list)	Focus Area
Directorate of Water Resources (under MARD)	Irrigation Management and Modernisation
Hanoi University of Water Resources	
Institute of Water Resources Planning	
Vietnam Academy for Agricultural Science	
Cologne University of Applied Sciences	Integrated Water Resources Management Land Use and Water Management
Potential Regional Partners (initial list)	**Focus Area**
IWMI	Integrated Water Resources Management
IRRI	
IWA	
AIT	
Royal Irrigation Department, Thailand	Irrigation Modernization

Modules Needed

Experts/Modules Needed (initial list)	Source
Irrigation Modernization (Tools, technique,…)	
Water Accounting	
Numerical Modeling for Irrigation Water Management	
Water Saving Technology	
Green Agriculture	
Risk Management in Agriculture	
Participatory Irrigation Management (PIM)	
Community Based Disaster Risk Management (CBDRM)	
……..	

Annex 6: Note for Discussion on Certification and accreditation process of centers of excellence and knowledge centers (Draft 25/2/2013)

Content

I Rationale

FAO member states have made land and water management as a 'key priority' since its creation. Since then FAO has moved rapidly to build up its program and to increase funding in this area, focusing on sustainable management, sound decision making based on scientific knowledge, piloting and capacity development in particular farmer field schools and irrigation modernization in the Asia-Pacific region.

In 2011, the FAO's Land and water division published its first State of Land and Water in the World (SOLAW) and raised the awareness on the increasing numbers of land and water systems lost or at risk and the threat on the sustainability of agricultural systems. The increasing uncertainty with climate change calls for flexibility and adaptability in those systems.

FAO is committed to supporting members country in improving food security and food production and therefore to support them to move towards sustainable and resilient farming systems. Agriculture water management and governance are key.

In the Asia Pacific FAO's work in the water sector is built on the following pillars: 1) at its heart is the **irrigation revitalization program**, now carried out in collaboration with academic and professional institutions as ICID, and the governments of FAO's member states. 2) That program includes development projects and policy level activities. 3) Normative tools and methods to assess and improve irrigation systems and agricultural water governance developed and tested throughout the years are in fact joint undertakings between FAO and interested parties. The MASSCOTTE family of tools is one of such technical programs that have been developed through a combination of field work and normative work. A wide range of activities is also developed in close cooperation with ICID.

After 10 years of field testing and implementation and with a call for more efficient for sustainable water management, it is proposed to institutionalize such tools in capacity development modules of university, training academies or other higher education or research institute. This is the rational of setting up a **network of Reference Centers** that will specialize on at least one of the key thematic area of irrigation modernization of interest to FAO (i.e water saving in irrigation, crop water productivity, water accounting etc.), using FAO tools and methods and will provide accredited capacity development offer on those subjects.
To do that effectively, they will work closely with a network of **knowledge centers**, in countries, at regional and international level (including FAO and selected partners) able to act as ***accredited centers*** to certify the quality of the capacity development initiatives, support with content as well as set a system to certify individuals in delivering these knowledge products.

In order to ensure that the capacity development is of high quality and support effectively improved agriculture water management (including irrigation modernization)and its governance, it is proposed to provide :

- clear criteria for joining a network of recognized knowledge centers for agriculture water management & its governance,
- clear criteria for being selected as a FAO reference centers (selection scheme), and standards and requirements for being accredited for delivering FAO tools and products (accreditation scheme) and,
- a clear process for certification to centers and individuals (certification process).

This is the purpose of that note.

II Partnerships and communities of practice –Knowledge Centers, FAO reference centers , communities of experts & users

Knowledge centers are centers recognized for their knowledge and know how. Some of them may have developed relevant tools and methods or high quality capacity development packages important for strengthening agriculture water management, its governance, and high relevance for revitalizing irrigation. For these specific set of knowledge & know how, the centers owning it play a role of *Recognized Knowledge Centers.* Such centers would assess and verify whether or not an institution or program qualifies to use their knowledge products for capacity development modules but also on how a trained individual could use it. The knowledge centers do or would provide a set of established requirements or standards for using their knowledge and know-how (it can be part of their intellectual property policy).

FAO Reference centers are Knowledge center (existing or being created) that specifically use FAO tools/methods either for projects, for research, and/or to develop capacities (see below section about FAO reference centers).

When it is an **individual** that owns the knowledge & know-how, he/she can contribute to the design of knowledge products and the training of trainers to upscale the use of the knowledge. That individual is the one to define how his/her knowledge can and should be used (standards and requirements on intellectual property).

Knowledge centers Recognized as part of the Network /knowledge hub

The *Recognition Scheme* for knowledge Centre to be part of a " knowledge network" for agriculture water management/governance, identifies the pre-eminent knowledge offer (capacity development package or relevant existing tools/methods or being developed) of national, regional and

international importance, based on their quality and significance for the Asian and Pacific region revitalizing irrigation strategy.

The Scheme recognizes that organizations with *Recognized offers* can care for a significant part of the region capacity development needs for irrigation modernization and sets out to raise standards across the sector. Organizations holding Designated offers are expected to work towards the provision of high-quality services which deliver the fullest possible access to those capacity development modules and to take a leadership role in the sector by helping other institutions – in particular the centers of excellence based in the region- in such ways as sharing expertise, offering advice and lending objects or materials. They may play a role of accredited centers for their designated offer and should define related requirements and standards for those.

The Scheme could be launched in 2013 at the workshop on capacity development (4-6 March 2013) and will recognize designated capacity development offers held in existing centers. Note: an information note on the designation scheme will be developed after discussion at the workshop[6].

Network of knowledge centers and FAO reference centers

The objective of the network is to enable collaboration and partnership between a network of Organizations and Individuals recognized for their knowledge and know how, and complementing each other on that offer. The aim is to stimulate long term partnership and support between individual organizations with the possibility to exchange ideas, users feedbacks, organize twinning, support effectively the *Asia-Pacific Knowledge Hub on irrigation services*, etc.

The starting point for that network is to map the existing offers and make them visible (" who does what"), knowledge and capacity development packages (who can do " what" in term of capacity development offer -" what" , "how" for " whom") and then put different complementary offers in relation.

The Knowledge centers in network will be able to collaborate in capacity development package with FAO reference centers (delivering FAO tools/methods), but could also offer themselves such packages to the network and request inputs from the FAO reference centers. In addition, this could offer the opportunity to partner for online tutorials on irrigation modernization for example.

Process of application to be part of the network of knowledge offers

Any organization may apply to be part of the network of knowledge centers with the Recognition of all, or an identifiable part, of its knowledge offer for designation to support capacity development to support the strengthening of agriculture water management and its governance.

It is proposed that applications for Designated status will be considered by a Panel that could be composed of representatives from FAO, ICID and the FAO centers of excellence. That panel would meet annually during the ICID conference. The first meeting of that panel would be in September 2013 during the World Irrigation Forum.

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[6] Note on scheme for recognizing Knowledge offer will address the following aspects : aims of the Scheme, benefits to applicants, definition of a knowledge offer, who can apply, designation criteria, quality and Significance, knowledge Management and Service to the Public, the Assessment Process, the Application Process –first stage: Intention to apply and eligibility, second stage: Application for Designation-.

Organization interested are invited to apply by 30 march to ensure their application is assessed at the September 2013 meeting. The first step is to fill the online survey.

- Survey on CAPACITY DEVELOPMENT to support agriculture water management improvement https://www.research.net/s/CapacityDevelopment_AgWaterManagement
- Survey on ORGANIZATION to deliver that capacity development relevant to agriculture water management https://www.research.net/s/CapacityDevelopment_AgWater_Organization

Table 2- List of interested knowledge centers (DRAFT – to be completed)

Center/ organization	Location	Thematic Focus	Designated Knowledge offer	Comments	Contact
eWater Source, AusAid	Australia	Water accounting	Modelling	A strong and clear Initiative framework will facilitate the provision of funding for this activity (if it is shown that the audience will be wide and impact high).	Robert Carr
I.O.T.C center	China , Beijing	Broad range of irrigation service	Water saving techniques	Lessons and techniques from the water-saving activities ongoing in China could be widely disseminated	
Wuhan University	China	Water saving	Water saving techniques		
CTIC	Vietnam				
NCER	Malaysia	Integrated water management for agriculture	Innovative Managing water techniques by economic zone		
ASCI	India, Hyderabad	Water accounting			
IIT'S	India, Delhi	Modelling			
CRIDA, Central Research Institute for Dryland Agriculture,	India, Hyderabad	Crop yield improvement	AQUACROP		
AC-IWRM	India, Karnataka,	IWRM			
BRRI, Bangladesh Rice Research Institute	Bengladesh, Gazipur		AQUACROP		
IWMI	Sri Lanka	Water management in agriculture		Research, Lead of the CRP5-canal irrigation (with FAO and other partners)	
FAO	Diverse	Irrigation modernization	MASSCOTE family of tools	Develop MASSCOTE, and redesign it (MASSCOTE 2.0)	Robina Wahaj Thierry Facon
FAO with Leuven university	Diverse	Crop yield productivity	AQUACROP	Develop AQUACROP and its improvements (boosting productivity, capturing more 'crop per drop')	Pasquale Steduto (FAO)
FAO, WHO, UNICEF,IWMI	Diverse	Waste Water	safer and more productive water reuse in agriculture	FAO, together with key UN-Water partners, is contributing to **develop capacities** of member countries for a **safer and more productive water reuse in agriculture**.	http://www.ais.unwater.org/wastewater
IHE Delft	Delft, Holland				
SEI	Stockholm, Sweden	Natural resources assessments	WEAP		
ICT	Twente, Holland				
IRC International Water and Sanitation Centre, The Netherlands	Burkina Faso, Ghana, Honduras, Nepal, Uganda	WASH Resource Centre Networks	Supporting WASH sector learning and change		http://www.irc.nl/page/68229

Center/ organization	Location	Thematic Focus	Designated Knowledge offer	Comments	Contact
IUCN	Diverse	Policy dialogue ; water accounting			
World Bank	Regional project?	Modernization	improving modernization effectiveness	Project on improving modernization effectiveness in Indonesia, Vietnam and at the regional level.	
Asian Development Bank,	Uzbekistan	Modernization		ADB has a high level of investment scheduled for irrigation modernization.	
Global Water Partnership, UNESCAP		Policy dialogue		Communities of practice and established networks utilized to conduct policy dialogues.	

Note: These centers have been asked to fill the online survey - ORGANIZATION https://www.research.net/s/CapacityDevelopment_AgWater_Organization.

III Setting FAO Reference centres for FAO tools/methods relevant to irrigation modernization and agriculture water governance

The proposed FAO Reference centers (as they aim to train specifically on FAO tools/methods) aim to offer to experts based in their country and abroad packaged training modules on relevant tools and methods to support the needed change in the way irrigation is managed. This initiative is focused on the Asia and Pacific region and therefore will focus on that region. However, the plan is to deploy this concept globally.

These centers will offer *certified training or capacity development modules on key aspects of irrigation modernization and agriculture water governance*. In particular they would be able to provide *individuals with a certification* on key FAO tools and methodologies that will guarantee their ability to implement innovative programs, and activities related to irrigation modernization.

An Accreditation scheme on FAO tools/methodologies (to be defined and established) will set, maintain and enhance the professional and ethical standards of those centres who are actively involved in capacity development related to irrigation modernization and agricultural water governance in the Asia and pacific region. That scheme will support identifying opportunities for further improvement and development. The centres participating in the Scheme will need to demonstrate their commitment to providing effective training modules for the strengthening of irrigation modernization programs and report on achievements.

These centers and their associated networks would offer information products and capacity development services –including FAO tools and methods- to a range of institutions and promote knowledge sharing and information management on agriculture water management and its governance, with a special focus on irrigation. These services aim to make information and knowledge accessible to a range of actors and support them to address sector needs.

FAO would support these Reference centers and their networks by informing and training focal persons in those centers in new tools/methods, as well as recommending them for projects capacity development activities in the region. In addition, advise will be provided on " financing" the sustainability of the activities, building partnerships with key government institutions for long term financing, as well a regional donors for targeted short term activities.

Designation of FAO reference centers

It is proposed to start with a limited number of specialized FAO reference centers in order to test and pilot a system of accreditation related to irrigation modernization, although it is acknowledged that

they are many institutions involved in irrigation training, and in the future more could be involved as FAO reference centers if they wish.
The centers selected should have the following characteristics:

1) They are eligible as a recognized knowledge reference center in Asia in areas of irrigation development and agriculture water management;
2) They are willing to take a lead in innovative capacity development and vocational training in irrigation modernization
3) They are open to innovation and accept to add new packages/modules related to irrigation modernization and agriculture water governance, in particular FAO tools and methods;
4) They accept the rules and obligations of the accreditation scheme to become a center of excellence/FAO reference center, in addition to their own status.

The following initial set of tools/methods are proposed by FAO to be included in capacity development/training packages.

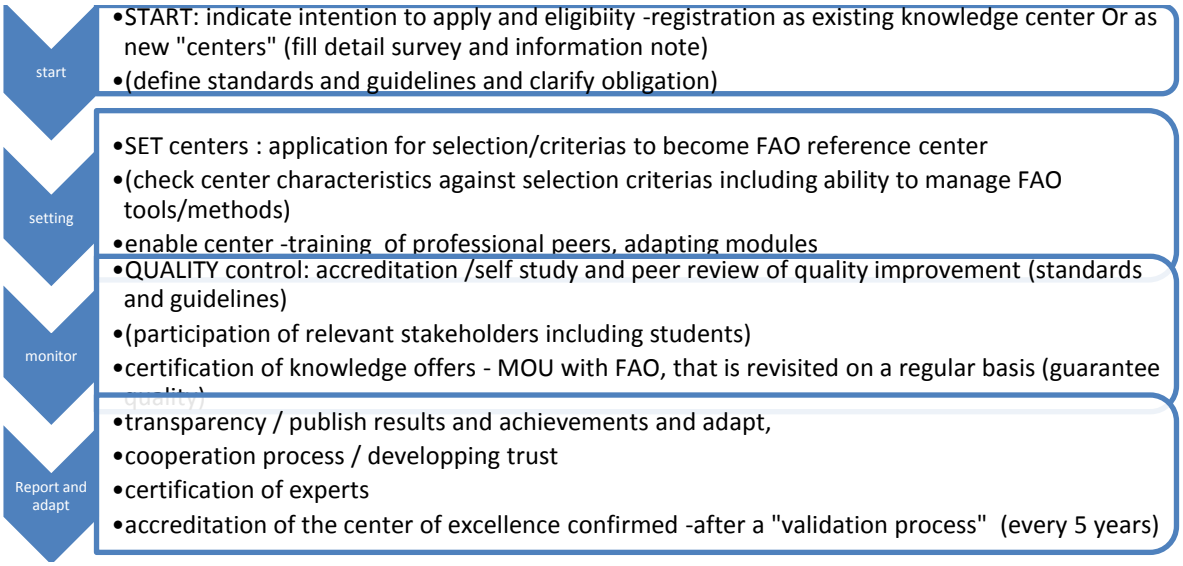
- MASCOTTE family of tools and methods (for large scale irrigation systems)
- AQUACROP
- CROPWAT
- Water accounting/water audit
- Investment framework for irrigation & strategic planning
- Farmers field schools on land and water
- …

ORGANIZATIONS - Process of accreditation for FAO Reference centers

Most of the centers interested to become FAO Reference centers would first need to be a recognized knowledge center to be eligible to become a FAO reference center. In some cases, " new centers of excellence" are created by countries as a key requirement for the implementations of the irrigation strategy (i.e Malaysia), and they also intend to equip them for FAO tools and methodologies as MASSCOTE. These new centers will also be considered for FAO reference centers.

The accreditation process proposed will be a voluntary mechanism that aim to check quality with both an internal and external review process. The requirements and standards will vary according to the knowledge offer(s) – (i.e MASCOTTE family of tools/methods have different requirements than AQUACROP for example ; they require field experience and repetition of the " training" a certain number of times). The following graphs summarized the accreditation process proposed, and also recommend to have a validation process on a regular basis to ensure that the quality level remains.

Graph 1: process of accreditation for existing knowledge centers and new " centers" to become FAO reference centers



Note: Elements being currently developed at FAO

1. An Information on the application procedure is being developed .
2. The requirements and standards required for the center of excellence to deliver training on FAO tools/methods are also in development –upcoming workshop in Nanjing (4-6 March 2013).

INDIVIDUALS - Process of certification of trainers and individuals on FAO tools and methodologies

In addition to the accreditation for organizations, another level of certification is required for the individuals themselves who will perform the trainings on FAO tools/methods but also those who will use the tools in the field (for example for MASSCOTE) as quality of implementation is key.

The following certifications should be defined for individuals for two main roles.

- Certification for trainers: A Training Qualification for Professional for those wishing to use their centre of excellence degrees to establish credibility and train others.
- Certification of professionals -A high performance accreditation : The specialist route to accreditation for those individuals providing irrigation modernization science services to high performance irrigation programmes and projects. The route will include certification from relevant centres of excellence on the participation at specific training modules but also the demonstration of practical experience.

The certification is given the basis of evidences of involvements as well as a final examination by a panel of experts and written exam. A high performance accreditation is validated only for 5 years, and needs to be revalidated by taking a new advanced training to update knowledge.

That certification will vary with the tool. For example, in the case of the implementation of the MASSCOTE family of tools, it is suggested that a professional to get a *high performance accreditation* should Demonstrate that the professional:

- knows the content of all the MASSCOTE modules, including the one on gender assessment, and new development and updates. This will be certified by accredited Organizations that deliver advanced training on MASSCOTE family of tools.
- Participated in at least 3 rapid appraisal with MASSCOTE or MASSMUS or MASSPRESS assessment. This again should be certified by the accredited Organization.

- Led a MASSCOTE assessment team for at least one of field level implementation successfully. This will need to be certified by a certifying body (i.e FAO), that would have participated in it.
- Documented the " MASSCOTE" exercise implemented if leading it and contributed to the community of practice on that tool.

Annex - Definitions

About Capacity development

Capacity development for FAO[7] is the process whereby individuals, organizations and society as a whole unleash, strengthen, create, adapt, and maintain capacity over time. It is an endogenous process that involves not only technical aspects but also social, political aspects. (A fundamental condition for a country to reach its developmental goal lies in its capacities at individual and organizational levels, and in the enabling environment) each of these three dimensions – individual, organizational and enabling environment – works interdependently with the others and influences the overall impact of a capacity development intervention.

It is therefore key to understand the capacities of a country in those three dimensions:
1) **Enabling environment** - it is the context in which individuals and organizations put their capabilities into action, and where capacity development processes take place. It includes the institutional set-up in a country, its implicit and explicit rules, its power structures and the policy and legal environment in which organizations and individuals function.
2) **Organizations** - defined as groups of individuals bound by some common purpose to achieve objectives. Organizational capacity refers to the collective capacity of its members to achieve their organisation's goal.
3) **Individuals -** capacities are developed at the individual level that lead to changes in skills, behaviors and attitude among a wide range of actors such as farmers, producers, policy makers, administrators and staff of organizations.

NOTE : Organization can be formal, informal, public, private, including non-governmental organizations (NGOS, CBOs) and civil society organizations (CSOs)

About certification, accreditation

Certification is defined as a formal procedure by which an accredited or authorized person or agency assesses and verifies (and attests in writing by issuing a certificate) the attributes, characteristics, quality, qualification, or status of individuals or organizations, goods or services, procedures or processes, or events or situations, in accordance with established requirements or standards. (business dictionary http://www.businessdictionary.com/definition/certification.html#ixzz2HGJqkuzQ)

Accreditation is a process in which certification of competency, authority, or credibility is presented. Organizations that issue credentials or certify third parties against official standards are themselves formally accredited by accreditation bodies (such as UKAS- http://en.wikipedia.org/wiki/UKAS); hence they are sometimes known as "accredited certification bodies"[8].The accreditation process

[7] FAO capacity development, enhancing FAO's practices for supporting capacity development of member countries. LM1 learning module 1 .

[8] USDA ISO Guide 65 Program Accreditation for Certification Bodies, U.S. Department of Agriculture, Agricultural Marketing Service, August 9, 2007

ensures that their certification practices are acceptable, typically meaning that they are competent to test and certify third parties, behave ethically and employ suitable quality assurance.

Quality assessment can be through 3 ways : 1) accreditation, 2) assessment, 3) audit as well as a combination of the three. The accreditation is an evaluation to whether or not an institution or program qualifies to for a certain status.

Annex 7 : List of participants (workshop on capacity Development)

Country	Name	Position	Organization	E-mail
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