

Empowering Farmers through Innovative Extension Systems

Agriculture must liberate India from the twin scourges of hunger and poverty while ensuring sustainability of natural resources. It must also address effectively the concerns of malnutrition among children and empowerment of women; being important SDGs. To ensure these, needs and aspirations of resource-poor smallholder farmers must be addressed through innovation-led, accelerated and sustainable agricultural growth. Historically, adoption of high-yielding dwarf varieties of wheat and rice during the Green Revolution era addressed both hunger and poverty. Of late, however, the yield gaps in agriculture, and income divide, in the farm and non-farm sectors have widened, primarily due to gaps in knowledge and skills and lack of timely access to improved technologies. Outscaling of appropriate technologies to reach farmers has emerged as a complex issue. Why farmers are not able to access or adopt new technologies are the major issues that create problems for the development officials and scientists alike. Further, growing challenges of natural resource degradation, escalating input costs, market volatility and, above all, the effects of global climate change contribute to declines in yield as well as farm income, thus making agriculture both non-profitable and unattractive. Thus, it is crucial to ensure inclusive growth in agriculture through innovative and synergistic approaches for achieving sustainable food and nutritional security. Therefore, 'agriculture research for development (AR4D)' requires a paradigm shift to

'agricultural research and innovation for development (ARI4D)' (TAAS, 2015).

Changing Paradigm in Extension

Agricultural extension in India and elsewhere consistently requires transformation. The current transitional phase also needs a 'renewed interest' and 'policy attention'. Public extension systems played a vital role during the Green Revolution but were confined mainly to the irrigated areas. This success was also due to a holy alliance among researchers, extension specialists, farmers and policy makers. At that time, the technology dissemination approach remained top-down, focusing on individual farmers. The current scenario of Indian agriculture is confronted with multifaceted challenges arising out of inefficient management of natural resources (soils, water, agrobiodiversity). All these have led to a decline in factor productivity and farm profitability. Apparently, this complexity cannot be overcome by routine transfer of technologies; rather, efforts would be needed towards translational research, requiring outscaling of innovations through 'outside the box' extension systems. Also, conscious deployment of rural youth, women and progressive farmers would help in a speedy transfer of technology and the needed impact on the livelihood of smallholder farmers. Farmers' welfare needs to be ensured through a 'farmer first' approach to benefit

equally producers and consumers. Further, in view of diverse demands for new innovation, new products, new information and new extension services, there is a need to shift from a top-down to a bottom-up approach, involving farmers' participation at the grassroots level, while ensuring confidence-building among farming communities to take risks and adopt more scientific and resilient agriculture. In the process, knowledge sharing on good agricultural practices, without dissemination loss, and incentives for critical inputs become highly critical to achieve future development successes in the agricultural sector. At the same time, partnerships among key stakeholders become vital for promoting agricultural growth. In the process, care is also needed to overcome complacency that has crept into the public extension system. Hence, this necessitates greater vibrancy in the NARES; requiring active involvement of stakeholders (farmers, NGOs, private sector, scientists and policy makers) and a shift in the extension approach towards outscaling of innovations for greater impact on smallholder farmers through higher productivity and income (TAAS, 2015).

In this context, the extension approach has to focus on farming communities rather than on the individual farming household approach. With the increasing challenges of addressing land degradation, soil quality and water-use efficiency, the NRM-related innovations, unlike the adoption of HYVs, showing immediate impact on crop productivity, need much more lead time to translate and assess impact on farmers' fields. This obviously throws a new institutional challenge for needed reforms in the existing extension system, which mostly depend on public organizations; and the role of the private sector becomes highly relevant, especially for involving rural youth, including women, in agricultural extension.

Involving Youth in Agriculture

Empowering youth through vocational training and building a cadre of 'technology agents' to provide technical backstopping as well as custom-hire services to smallholder farmers would go a long way in linking research with extension, and thereby accelerating agricultural growth. There is also a need to link 'land with lab', 'village with institute' and 'scientists with

society' to ensure faster adoption of efficient resource-utilization technologies, which would benefit producers and consumers. In the transformation process, the agricultural technology agents need to become job creators and not job seekers and provide best technologies as well as quality inputs on farmers' doorsteps. Another strategy could be to establish 'agri-clinics', where technology agents can join hands to ensure a single-window system of advisory services to farmers (YPARD, 2012).

Lately, in the changing socioeconomic environment, there has been steady improvement in the use of ICT, rural infrastructure and literacy standards in farming communities. Public sector institutions such as the central and state government departments of agriculture, horticulture, livestock, including fisheries; the central and SAUs; a network of Krishi Vigyan Kendras (KVKs); and the Agricultural Technology Management Agency (ATMA) are empowering farmers. But efficient agro-advisory in the wake of increasing demand for quality agricultural knowledge, together with input support, can be best delivered through pluralistic agricultural extension, i.e. a mix of public-private sector participation. Emergence of private sector institutions such as corporate organizations, community-based organizations, farmer associations, farmer cooperatives, self-help groups, watershed and water-user associations, farmer-producer companies, NGOs; input providers for seeds, nutrients and pesticides; and service providers for small tools and implements; para-professionals (Kisan Mitras etc.); input producers; the private corporate sector; fertilizer companies; marketing firms; and processing enterprises should be encouraged to bring in much-needed complementarities in providing agro-knowledge advice to farmers (Saravanan, 2010; Singh *et al.*, 2011; YPARD, 2012).

Empowering progressive farmers is also a must. Their farm-led innovations can be recognized and promoted for further scaling and refinement to make them efficient, cost-effective and adapted to local situations. Also, information acquisition by smallholders from other progressive farmers is invariably more effective. The information demand by farmers is often changing as they intend to make farming more diversified and resilient. Thus, a demand-driven extension approach around integrated farming

systems should be addressed while promoting secondary and speciality agriculture.

Also, there is a need for convergence among different government-sponsored programmes. Accordingly, concerns for collaboration, convergence and synergy need to be addressed along with issues of optimizing institutional arrangements of prevailing pluralistic agricultural extension and farm advisory.

New Institutional Mechanisms

Institutional reforms (extension and non-market) emphasize stakeholder participation and have the potential to improve efficiency and effectiveness of extension efforts. They emphasize how agricultural extension cannot operate in isolation but as part of a broader information system, the agricultural knowledge system (AKS), which comprises three pillars: research, extension and agricultural higher education. The three pillars involve complementary investments that should be planned and sequenced as a system rather than separate entities. Success is only possible with strong cross-institutional linkages between AKS systems and their clientele. Agricultural extension needs to expand its focus on non-farm micro-enterprise development initiatives as a way of improving livelihoods, because most rural people depend upon multiple sources of income. Agricultural extension services should go beyond providing technical support, and provide market extension and advice on the importance of farmers organizing into farmers' associations. Approaches to extension should change in response to the changes in the global environment through participatory learning and action (PLA), including participatory rural appraisal (PRA), rapid rural appraisal (RRA), participatory learning methods (PALM), participatory action research (PAR) and farming systems research (FSR). There are four basic themes: (i) collaboration through participation; (ii) acquisition of knowledge; (iii) social change; and (iv) empowerment of participants. Action researchers are responsible for developing a learning environment that challenges the status quo and for generating better alternatives to improve their future. The CRASP definition of action research has

been used: *critical collaborative enquiry by reflective practitioners, who are accountable in making the results of their enquiry public, self-evaluative of their practice, and engaged in participative problem-solving and continuing professional development* (Rasheed, 2012; *The Hans India*, 2017).

ICT for Knowledge Dissemination

Farming and ICT seem to be the most distantly placed knowledge sets; farming being the most primitive and basic and IT being the most advanced and modern. However, ICT plays a significant role for the betterment of farming. The information related to policies and programmes of government, schemes for farmers, institutions through which these schemes are implemented, new innovations in agriculture, good agricultural practices, institutions providing new agricultural inputs (high-yielding seeds, new fertilizers) and training in new techniques are disseminated to farmers through the use of information technology to ensure inclusiveness and to avoid a digital divide. Access to price information, agriculture information, national and international markets, increasing production efficiency and creating a 'conducive policy environment' are the beneficial outcomes of eAgriculture, which enhance the quality of life of farmers. The management of soil, water, seed, fertilizers, pests, harvest and post-harvest is the important component of eAgriculture where technology aids farmers with better information and alternatives. It uses a host of technologies like remote sensing, computer simulation, assessment of speed and direction of wind, soil-quality assays, crop yield predictions and marketing using IT. In India, there have been several initiatives by state and central governments to meet various challenges facing the agriculture sector in the country. The eAgriculture is part of Mission Mode Project, which has been included in the NeGP (National e-Governance Plan) in an effort to consolidate learning from the past, integrate all the diverse and disparate efforts currently underway, and upscale them to cover the entire country (eAgriculture, 2012; Uphoff, 2012; Singh *et al.*, 2015; Karubanga *et al.*, 2016; Mamur *et al.*, 2016; *The Hans India*,

Box 26.1. eAgriculture system. (From: <https://www.intel.in>; eAgriculture video, youtube.com; Grameen Intel Social Business (www.Grameen-Intel.com) and Intel World Ahead Program (www.intel.com/worldahead).)

- eAgriculture initiatives: these bring together a wide array of local and regional stakeholders to form a mutually beneficial value chain.
- Grameen Intel and other social businesses: information and expertise, consulting services, technology and programmes to reach rural and impoverished markets.
- Governments and multilateral development agencies: programme support to enable and increase rural outreach, improve food security, create jobs and develop partnerships with local businesses and community organizations.
- Banks and other financial institutions: credit, capital and other financial instruments (crop insurance, subsidies) for entrepreneurs and farmers.
- Universities and agriculture extension systems: technology to strengthen extension systems; advice and technical support for farming communities; training and capacity-building for entrepreneurs; research and development projects designed to solve problems faced by farming communities.
- Supply chain (e.g. suppliers, commodity markets, aggregators): best-of-class products and services for farmers that improve returns to all stakeholders, including farmers.
- Technology companies: internet connectivity, hardware and software solutions that create access to new markets, value chains and business models.
- Community organizations (e.g. farmer cooperatives, rural telecentres, government- and NGO-run agriculture service centres): help entrepreneurs, provide grassroots agriculture domain and business support, and enable programmes to scale efficiently.

2017 (<http://www.thehansindia.com>)). The highlights of eAgriculture are given in [Box 26.1](#).

National Dialogue on Extension

In view of the above, a National Dialogue on 'Innovation Extension Systems for Farmers' Empowerment and Welfare' was organized jointly by TAAS and ICAR in New Delhi from 17–19 December 2015, in which 242 stakeholders participated from all over India. The discussions centred around issues such as current status and challenges, the need to revisit existing extension systems, farmers' perception and need, role of media and communication systems, empowerment and involvement of women and youth, role of NGOs and the private sector, policy and institutional reforms, and urgent need for effective coordination and convergence. Participants were unanimous in the need for renewed thrust to transform the present agricultural system to make it more meaningful, relevant and effective by involving new actors of extension such as youth and women, NGOs and progressive farmers (YPARD, 2012; TAAS, 2015). In general, the following points are important for immediate attention:

- Effective and efficient agricultural extension and advisory services are critical to achieve higher productivity, promote agricultural trade to help raise farmers' income, while achieving a national target of 4% growth in agriculture.
- The scope of agricultural extension has undergone certain fundamental changes with a growing number and diversity of extension service providers.
- The public extension system caters merely to 15%, whereas such services provided by others like the private sector, NGOs, farmers and social media are yet to be optimally organized and mainstreamed.
- A real transformation in the existing agricultural extension requires demand-driven, multi-dimensional, multi-agency, market-oriented, pluralistic and outside-the-box approaches.
- Empowerment of women and youth for agricultural extension and farmers' welfare is critical for large-scale adoption of highly scientific, resilient, productive and remunerative secondary and speciality agriculture by farming communities.
- Knowledge sharing on good agricultural practices, without dissemination loss, is indeed

critical to achieve better results in the agriculture sector; for which the role of print, social media, like radio and TV, and ICT (especially mobile phones) is considered essential.

- Innovations in agricultural extension would henceforth demand 'paid extension' services, especially when there is a scope to increase farmers' income, for which an enabling policy environment is now emerging for the private extension system through small-scale entrepreneurs as technology agents and input providers.

Need to Reorient the Extension System

To overcome the multiplicity and increasing complexity of problems being faced by farmers, there is a need to adopt (TAAS, 2015) the following strategies:

- A 'farmer first' approach needs to be promoted with twin objectives. On the one hand, to better understand critical needs of farmers, and on the other, to identify options that can address these needs in a manner benefitting all involved in the agricultural value chain. To ensure this, a National Mission on Agricultural Extension needs to be established as a priority by the Ministry of Agriculture and Farmers' Welfare to plan, undertake and promote collaborative extension interventions by public, private, NGOs and progressive farmers and to give a modern extension thrust across the board, optimizing effective coordination and evolving efficient convergence mechanisms. The new national mission may also oversee coordination and convergence of various state- and district-level extension activities by the KVKs, ATMA, private sector, NGOs and progressive/innovative farmers. Initially, an annual budgetary provision of around Rs 15 billion could be made for implementing the much-needed mission-mode approach in agricultural extension.
- Multidisciplinary, inter-institutional efforts towards translational research must be accelerated with required policy and financial support, especially to outscale innovations after validation and needed refinements.

- Conscious deployment of rural youth, women, farmer professors and authorized/trained/certified input providers are to be ensured through innovative approaches, such as the formation of farmers' self-help groups, farmers' cooperatives, farmer-producer companies, farmer-to-farmer training, agri-clinics etc. to catalyse speedy technology transfer and diffusion.

Foresight Approach for a Paradigm Shift

A foresight approach to ensure a paradigm shift from top-down to bottom-up needs to be adopted to meet new demands for innovations, products, information and extension services (Singh *et al.*, 2015; TAAS, 2015), such as:

- Ensuring farmers' participation at grass-roots level and confidence-building among the farming community to take risks and adopt more scientific and resilient farming technologies. Simultaneously, provide policy incentives for critical inputs as well as farmers' participatory activities by all stakeholders and market players.
- Encouraging farming systems' extension by interdisciplinary, inter-institutional extension teams, comprising subject matter experts, as was envisioned under the earlier institution-village linkage programme (IVLP) for effective agricultural extension.
- Promote knowledge-sharing on good agricultural practices aimed at minimizing dissemination loss for services relating to inputs, technologies, insurance, processing, value addition, markets etc.
- Encouraging required partnerships among key stakeholders to promote demand-driven, multi-stakeholder-oriented agricultural extension around integrated farming systems. This should be ensured through in-built incentives to adopt innovative technologies that optimize the use of natural resources, though requiring more adoption time to assess, refine and diffuse NRM-related technologies on farmers' fields.
- Providing innovative alternate knowledge/information dissemination systems with

authentic content in farmer-friendly communication mode such as the Kisan TV channel, ICT, smart phones, print media and radio, to ensure their distant reach and effectiveness.

- Emphasizing linking farmers to market is a key step towards inclusive market-oriented development (IMOD) for smallholder farmers. Also, focusing on designing women- and youth-centric programmes for their active role in market-oriented agri-food value chains with provision of timely incentives.
- Stimulating the national agricultural extension system beyond free extension; paid extension services through agri-clinics are to be encouraged with an in-built safeguard mechanism in place.
- Private sector participation in the national agricultural extension system is to be encouraged through corporate social responsibility (CSR), and also through much-needed PPP, supported by an enabling environment.
- Emphasis shall be laid on documentation and wider dissemination of successful extension models under diverse agro-ecologies and farming situations. Similarly, lessons learnt from failures can be assessed to take corrective measures elsewhere.
- Extension research should go beyond production to post-production extension. As such, higher emphasis needs to be placed now on innovation, growth and development.
- Communication systems need to be enhanced in rural areas in order to play a more proactive role in effectively reaching farming communities through excellent linkages with agricultural universities/colleges, ICAR institutes, NGOs, private companies and other key R&D players.

A Road Map for Innovative Extension

Considering the emerging challenges before Indian agriculture – existing constraints for technology transfer and options for scaling innovations for improving productivity and good agricultural practices around integrated NRM, opportunities for agricultural diversification, secondary and speciality agriculture, and options for linking farmers to market – a new road

map for innovative extension systems is urgently needed to ensure faster scaling of innovations for greater impact. The following action points need urgent consideration:

- Establish agri-clinics, by encouraging well-trained individuals as small-scale private entrepreneurs, or by a group/club/association of progressive farmers. At least one agri-clinic/10,000–20,000 farm families needs to be established under the national mission, with funding provision of around Rs 5 million each (preferably on a 50-50 basis). Accordingly, to cover the existing 140 million farm families, 14,000 agri-clinics would be needed for which a budgetary requirement of around Rs 35 billion is to be met from the overall budget of the proposed National Mission on Agricultural Extension. Moreover, all agri-clinics may not be established in one go, and hence can be taken up in a phased manner over five years (needing around Rs 7 billion each year), based on the well-defined accreditation/recognition process.
- Induct farmer professors to facilitate farmer-to-farmer knowledge extension and skill transfer without dissemination loss, to provide vocational trainings for rural youth and farm women for 'Skill-up India' and 'Stand-up India' initiatives, build capability of *Panchayats* and ensure better support of existing institutions for technology/input delivery, credit, subsidy, insurance, value addition and marketing. To begin with, around five to ten farmer professors can be inducted in each district, for which budgetary provision of approximately Rs 500 million to 1 billion may be kept in the mission's overall budget.
- Establish a National Farmers' Innovation Fund (NFIF) of about Rs 1 billion with the support of both government and the private sector to encourage and involve progressive and innovative farmers to promote farmer-to-farmer extension and to support needed initiatives to build farmer-scientist links for outscaling innovations through testing, refinement and adoption on a large scale. It should also provide incentives and rewards in different forms to innovative farmers.

- A cabinet committee on farmers' welfare needs to be constituted to meet the aspirations of Indian farmers as well as those who are contributing to sustainable development and growth of agriculture. In particular, this committee has to ensure much-needed coordination and convergence for cohesive implementation of agriculture- and rural development-related programmes by different union ministries and government departments.
- Without further delay, concerted efforts need to be made for implementation of the recommendations of the High-Power Committee on the Management of Krishi Vigyan Kendras (KVKs), to ensure improved efficiency, effective monitoring and required relevance of farmer–science connections.
- Emphasis should be given to strengthening, coordination and modernization of KVKs rather than their further multiplication. For sector-wise strengthening of much-needed site-specific programmes/activities, there is a need to revisit the enhanced cadre strength of ten scientists/KVKs and to redeploy some subject matter specialists to take care of diversified/relevant areas such as horticulture, agroforestry, animal science, fisheries, post-harvest processing and social science.
- To establish Agricultural Technology Information Centres (ATICs) in all KVKs to promote 'land–lab' linkages and to reap benefits of research through promoting new innovations. There is a need to revisit existing ATMA-KVK convergence models and to bring in needed reforms concerning allocation of resources to meet contingent and exigency needs for training and knowledge/information sharing related to agriculture with local farmers through KVKs, and to shed redundancy and improve efficiency in all district-/local-level agricultural extension matters (Saravanan, 2010).
- To ensure expansion of scope of the proposed National Agricultural Education Project (NAEP), being funded by the World Bank and implemented by the ICAR, to address much-needed reforms in the public extension system and to strengthen capacity-development activities through informal training of private entrepreneurs to act more effectively as technology agents. The plan should be revised and implemented as the National Agricultural Education and Extension Project (NAEEP). This would trigger innovations by creative and skilled young minds for serving society and the agriculture sector with a human 'face'.
- Kisan Aayog (Farmers' Commission), on the pattern of Punjab and Haryana, needs to be established across the country in each state to facilitate the required transformation in agricultural extension, to promote both the national and local sustainable agricultural development agenda and to assist/advise the states in promoting relevant farmers' welfare-related policies and programmes based on well-defined and formally adopted state agriculture policies.
- Revamp agricultural extension-related education by initiating new courses on rural entrepreneurship, agricultural journalism, agri-business management etc., to bring innovative concepts and new economic options for rural youth. Also, there is an urgent need to teach agriculture as a subject for science students in the high schools to generate much-needed awareness of the role of agriculture in household/national food and nutritional security.

Conclusion

Extension should respond to both external and internal forces. Shifting from a traditional, top-down approach towards a more participatory approach is, therefore, the need of the hour. The challenges are technology and its transfer, and the process of problem-solving capacity-building. The extension workers must transform themselves from messengers to facilitators, for success in the changed scenario. The concept of participatory innovation development and extension is based on dialogue, farmer experimentation and strengthening of the organizational capacities of rural communities. The key steps are adopting the right kind of tools, like participatory rapid appraisal (PRA) tools, to obtain better results and introducing training programmes based on raising awareness through participatory, dialogue-based education. Newer extension methods including ICT and eAgriculture systems

have helped in providing access to information through various communication technologies including the internet, wireless networks and cell phones, through which people communicate with others across the world. Thus, there is an urgent need for a comparative analysis of different extension strategies, organizational models, institutional innovations and resource constraints and how an extension system might be transformed and strengthened through specific policy and organizational changes as well as needed investments.

There is an urgent need to sensitize and get agreement among actors at all levels on the need to: (i) strengthen interaction and learning between public and private service providers; (ii) involve public and private service providers; (iii) make an inventory of existing service providers; and (iv) strengthen coordination at the local level between service providers. Education reforms need to be introduced in schools and introduction of diploma education and training of input-output dealers in agriculture. There is a need for gender mainstreaming through specialized training on women extension workers, on improved practices and value addition, as well as awareness on nutritional aspects. The government should implement ICTs and e-agriculture and new extension systems on a larger scale all over the country. To popularize this service, the government should implement integrated marketing communication

using the popular print and electronic media so that more and more people are aware and take advantage of this service. It needs to be ensured that an enabling environment is in place for a pluralistic extension service system to develop. There is a need to specifically develop a sectoral or local government policy that supports public-private interaction in service delivery. There is a need to open up the public service delivery system by introducing downward accountability mechanisms and performance contracts, and involving farmer organizations in service procurement.

Agri-business development is changing from time to time and youth and gender need to be oriented accordingly. The farmer groups and organizations must be empowered to articulate demand. There is a need to develop local capacity for small-scale service providers, local small-holders and private service providers; use new extension approaches based on participatory action learning; and develop local extension management capacity, including capacity in planning, monitoring and evaluation, and downward accountability and transparency. The best practices need to be shared more widely across the programmes so that various components of the programme complement each other better. Also, there is a need to establish a feedback platform for farmers to increase accountability of extension staff.

References

- eAgriculture (2012) eAgriculture: Using Technology to Empower Farming Communities Innovative Project Creates Sustainable Agricultural Ecosystems in Rural India. Grameen Intel Social Business Ltd. Available at: https://www.intel.co.uk/content/dam/www/public/us/en/documents/corporate-information/eagriculture_program_cs.pdf (accessed 15 June 2018).
- Karubanga, G., Paul, K., Florent, O. and Haroon, S. (2016) Empowering farmers to learn and innovate through integration of video-mediated and face-to-face extension approaches: the case of rice farmers in Uganda. *Cogent Food & Agriculture* 2, 1274944.
- Mamur, R., Sheikh, M., Islam, Md R. and Md Quamruzzaman (2016) Which factors contribute most to empower farmers through e-agriculture in Bangladesh? *Springerplus* 5(1), 1742.
- Rasheed, S.V. (2012) Agricultural Extension in India: Current Status and Ways Forward. Centre for Research on Innovation and Science Policy (CRISP), Hyderabad, India. Presented in Roundtable Consultation on Agricultural Extension, Beijing, March 15–17.
- Saravanan, R. (2010) *Agricultural Knowledge Information Systems and Innovative for Technology Dissemination and Sustainable Agriculture Development*. Coudel, E., Devatour, H., Soulard, C.-T. and Hubert, B. ISDA 2010, June, Montpellier, France.
- Singh, K.M., Meena, M.S. and Jha, A.K. (2011) Agricultural Innovations in India: Experiences of ATMA Model. Paper presented in the International Conference on Innovative Approaches to Agricultural

- Knowledge Management: Global Extension Experiences. Organized by International Society of Extension Education (INSEE), 9–12 November, NAAS, New Delhi.
- Singh, K.M., Shekhar, D. and Meena, M.S. (2015) Modern extension approaches for livelihood improvement for resource poor farmers. MPRA paper 68414. Available at: <https://mpra.ub.uni-muenchen.de/68414/> (accessed 15 June 2018).
- TAAS (2015) *National Dialogue on Innovative Extension System for Farmers' Empowerment and Welfare*. Trust for Advancement of Agricultural Sciences, Pusa Campus, New Delhi.
- The Hans India* (2017) Transforming agriculture with e-technology, 22 May.
- Uphoff, N. (2012) *Empowerment of Farmers through ICT*. C Expert group meeting on Promoting Empowerment of People in Advancing Poverty Eradication, Social Integration, and Decent Work for All. United Nations, New York, 10–12 September.
- YPARD (2012) Innovative extension systems for farmers' empowerment and welfare: young professionals for agricultural development. Available at: www.ypard.net (accessed 3 September 2018).