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## **The experiences of India's agricultural extension system in reaching a large number of farmers with rural advisory services**

Background paper to the SDC face-to-face workshop  
"Reaching the Millions!" in Hanoi, Vietnam, March 2015

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## Summary

This desk study analyses the Indian rural advisory service (RAS) system with the goal to derive learning from its successes and challenges in reaching millions of farmers in a poverty oriented, ecological, and sustainable way. The study provides a description of the Indian RAS system, and analyses a range of private and civil society RAS providers, which are representative for ongoing RAS initiatives throughout the country.

### Cornerstones of the Indian RAS system

- 119 million farmers with in average 1.23 hectare land area
- Pluralistic RAS system that includes public RAS (in average one extensionist / 1200 farmers), a multitude of private extension schemes, 230 million members of agricultural cooperatives, and one million NGOs.
- Public RAS reaches 6% of the more than 119 million Indian farmers (Ghimire: 2014)
- In 2005, only 40% of farmers accessed agricultural information from any source, while progressive farmers and input suppliers are the major information source for small scale farmers. (Adhiguru et al. 2009)

### Key learnings from the Indian RAS system

#### *Capacity building*

- The state institution MANAGE trains and accredits private input dealers to complement the government extension system. This increases the outreach of RAS.
- Progressive farmers are the most accessed source of information for poor farmers. By building their capacities the government could, but yet does not further increase the outreach of the extension system.

#### *Mobile applications and mass media*

- Mobile applications can increase the outreach of RAS also to remote areas. Mobile applications are best accessible to poor farmers if they include voice messages.
- Radio programmes offering listeners to put questions are more appreciated than one side information provision. They increase the outreach of RAS in a relatively cheap manner.

#### *Functions of the government*

- The Agricultural Technology Management Agency (ATMA) reflects a key role of the government: It coordinates diverse RAS activities and facilitates linkages between research, extension, private sector, NGOs, and farmers in order to increase scale of private and public RAS provision.
- Monitoring and impact assessment are key functions of the government to improve effectiveness and inclusiveness of a (public) RAS system.
- The Government of India was able to increase inclusiveness of public RAS delivery by issuing respective guidelines, e.g. for participation of women in public trainings.
- It is the role of the government to provide a regulatory framework to mitigate environmental and social risks of private RAS delivery, in particular for contract farming and embedded services.
- Locally based research-extension-farmer meetings are a mechanism to feed farmer's requirements into research activities. If research is publicly financed, it is a role of the government to facilitate such meetings.

#### *Functions of the private sector and civil society*

- Both private agencies and civil society organisations complement public RAS delivery. They offer multifunctional services, which is considered an economically viable reaction to farmers' demand.
- NGOs have two functions: they provide RAS to poor farmers in remote areas without private investments, and they pilot and apply innovative, inclusive RAS approaches. This is possible due to a) their size, b) their number (one million Indian NGOs), and c) their collaboration with a range of actors and funding sources.

### Major challenges

- Lack of qualified public extensionists that are ready to work in remote areas
- Cove tailing of national research and extension plan with farmers' requirements is challenging and yet a limiting factor for effective public extension
- Public extension workers have to cover a range of services, not only for extension. Depending on state priorities, public agricultural extension delivery is neglected.
- Private investments complement the public extension system and increase scale of RAS delivery. In order to mitigate related ecological and social risks a respective policy framework and monitoring mechanism must be in place and implemented.

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## Abbreviations

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ACAPS	Private Agri-Clinics and Agri-Business Centres
ATMA	Agricultural Technology Management Agency
CAPEX	Capitalisation of Experiences
DASP	Diversified Agricultural Support Project
DoA	Department of Agriculture
FYP	Five Year Plan
GoI	Government of India
ICAR	Council of Agricultural Research
KVK	Krishi Vigyan Kendras
MoA	Ministry of Agriculture
MANAGE	National Institute of Agriculture Extension Management
NATP	National Agricultural Technology Project
NGO	Non-Governmental Organisation

## Research framework and methodology

The study at hand analyses the institutional framework of the Indian agricultural extension system. It describes the public extension system with its diverse links to private sector and civil society, and discusses extension delivery and financing methods of the selected RAS providers.

The study is part of a broader learning exercise to capitalise experiences (CAPEX) in SDC financed RAS projects and country RAS systems in Asia. The goal is to search for innovation and learning to reach a large number of farmers with RAS in a poverty oriented, ecological and sustainable way.

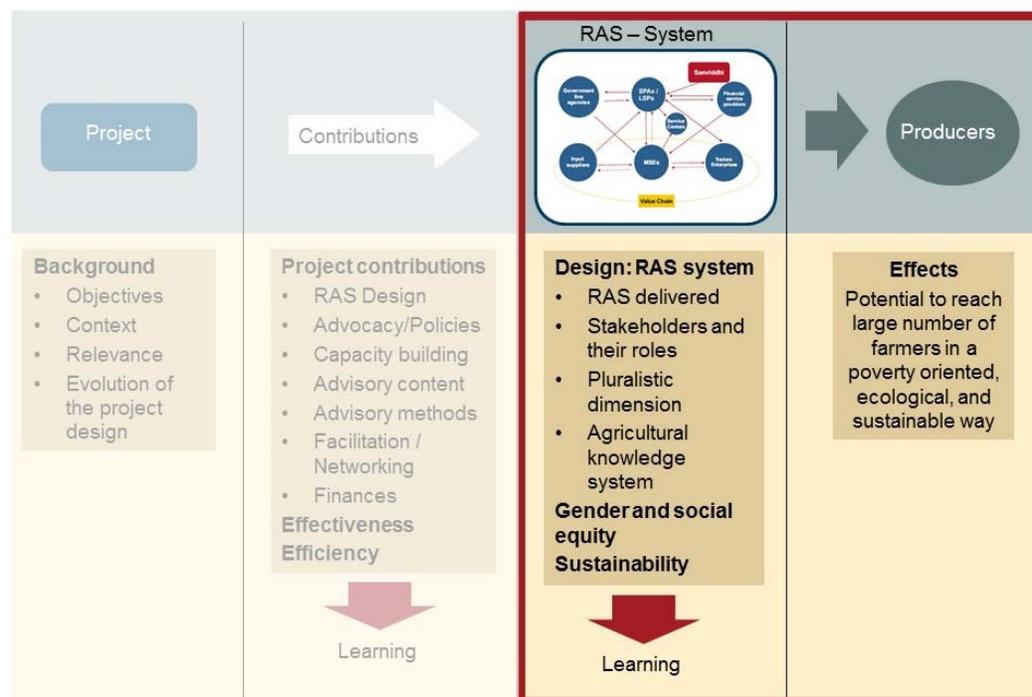
The learning exercise encompasses the following studies:

- CAPEX RAS: Public Service for Agriculture and Rural Development Programme – Vietnam
- CAPEX RAS: Sustainable Soil Management Programme – Nepal
- CAPEX RAS: Samridhi Local Service Provision – Bangladesh
- CAPEX RAS: Laos Extension for Agriculture Programme – Laos
- CAPEX RAS: Kyrgyz-Swiss Agricultural Project – Kyrgyzstan
- CAPEX RAS: Country RAS system in India
- CAPEX RAS: Country RAS system in China

All analyses are desk studies based on project reports, thematic publications, and interviews with 1-4 resource persons. The studies follow the research framework as shown below. Whereas the two country RAS studies use only the second, highlighted part of the research framework, project studies first describe the project's background and analyse the project contributions to the RAS system, their effectiveness and efficiency.

Finally, by analysing the institutional setting of diverse RAS systems and their effects on agricultural producers, all studies search for innovative approaches in public and private extension delivery to reach out to a large number of farmers in a poverty oriented, ecological and sustainable way.

### Research framework



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## 1 Agricultural context of India

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With a population of about 1.1 billion persons, India is expected to overtake China as the world's most populous country by 2030. India is the second fastest growing economy in the world, it has the world's second largest arable land base (after the U.S.), and the second largest irrigated area (after China). (Gurung: 2008) However, the country faces an increasing challenge to ensure that growth is sustainable and inclusive (FYP: 2012). Despite having a comparative advantage in producing agro-food products, India's share of international trade in agro-food products remains relatively small at 1.5 percent. (Gurung: 2008)

Regarding rural economy, India's population continues depending on agriculture as its primary source of livelihood. 83 percent of farmers operate holdings of less than two hectares, and the average holding size is 1.23 hectares. Land holdings are often fragmented and unirrigated. A large share of the population is entirely landless, although agriculture is their main source of livelihood. Landless have inadequate financial resources to purchase land and often depend on leasing in small plots on insecure terms, sometimes only for one season. Landless and poor small holders are unable to take advantage of the economies of scale, and to invest in inputs such as irrigation, quality seeds or machinery. They have limited access to formal credit. These farmers are yet often ignored by extension agencies, thus seldom receive information on new technologies or training in skill-intensive agricultural practices (FYP: 2012).

India also faces challenges of exclusion and inequitable access due to multiple deprivations of class, caste and gender – all of which require innovative approaches and solutions, and looking beyond the conventional way of doing things (FYP: 2012). Agricultural extension is key for the future development of the agricultural sector: today one-fourth of the yield gap for maize is due to knowledge deficits (Ferroni: 2011).

In the last few years, India have witnessed the diversification of agriculture towards high value commodities such as fruits, vegetables and livestock products at a fast pace. High value commodities account for a large share of the total value of agricultural production in a number of districts in India. Further, urbanisation has resulted in the rapid expansion of supermarkets retailing agricultural goods. Raising demand for food items and relatively slower growth of supply has resulted in frequent spikes in food shortages. "The need for a second green revolution is being recognised more than ever before" (Government of India, 2011).

This growing pressure on agricultural productivity to increase India's food security led to an increased recognition of the importance of agricultural extension. Not only the government of India, which is still the main service provider of the country, but also private sector and civil society, such as NGOs and non-profit organisations have a growing interest to involve in agricultural extension. The present Indian agricultural extension system is one of the largest extension system in the world, highly pluralistic and dynamic.

## 2 Agricultural subsidies, Policies and Programmes of the Government of India

This chapter provides an overview of the policies and programmes that characterise the institutional framework of extension activities in India. They tackle the public as well as the private extension service provision.

### 2.1 India's Agricultural Policies

After independence, India pursued a policy of food self-sufficiency in rice and wheat. Trade was strictly regulated through high tariff rates and quota restrictions. During the 1960s and 1970s, high yielding rice and wheat varieties were adopted. At the same time, India expanded irrigated areas, promoted increased use of chemical fertilizers and pesticides, and improved access to institutional credits. Together, these initiatives increased agricultural production and made India self-sufficient in national food grain production. Production gains from Green Revolution technologies continued through the mid-1980s and then decreased. During the 1980s, the input subsidies that the Government of India (GoI) has put in place also began to strain government budgets. Except for the removal of export controls, the series of reforms since 1991 did not lead to fundamental changes in India's agricultural sector. The main policy goals remain:

- to attain food self-sufficiency,
- to ensure remunerative prices to farmers,
- to maintain stable prices for consumers.

To meet these goals, India developed a number of policy instruments, such as minimum support prices<sup>1</sup>, food subsidies for consumers, regulated trade, and input subsidies for producers. (Gurung: 2008)

### 2.2 India's five-year plans

India's 10<sup>th</sup> to 12<sup>th</sup> five-year plans (2002-2017) emphasize innovation in agricultural extension as key to increase agricultural growth by reducing yield gaps in agriculture. Accordingly, the five-year plans stress the need to strengthen agricultural extension in India (Glendenning: 2010). Further, the 12<sup>th</sup> five-year plan recognises that innovation is the engine for a national growth that benefit also the poor, and has declared 2010 - 2020 as the 'Decade of Innovation', which applies also for agriculture (FYP: 2012).

### 2.3 Agricultural extension reform initiatives

Since 1990, a range of agricultural extension reforms were initiated to improve the extension system that was considered inefficient and ineffective. The reforms focused on supply side interventions, which can be summarised as follows (Raabe: 2008):

1. **Decentralisation reform programmes** aimed at putting into action the 73rd Constitutional Amendment, which foresees a transfer of fiscal and administrative decision-making authority from the central state to the local level. Two exemplary decentralisation reform programmes are the Diversified Agricultural Support Project (DASP) and the National Agricultural Technology Project (NATP) – both were initially supported by the World Bank. The overall goal was to render the public extension system more demand driven by decentralising and finances and planning of extension activities:
  - **The NATP programme** encouraged involvement of private sector through competitive grants programmes supporting private RAS activities. Under NATP, **the Agricultural Technology**

<sup>1</sup> According to the WTO, food subsidy provided by the Indian government for paddy during 2010-11 worked out to be around 6 per cent of the total output of the commodity in value terms. Source: [http://economictimes.indiatimes.com/articleshow/42288827.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](http://economictimes.indiatimes.com/articleshow/42288827.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst)

**Management Agency (ATMA)** was established to coordinate extension and research stakeholders in order to improve research - extension - farmer linkages. (Raabe: 2008). ATMA got considerably diluted later during 2005-2010. But again got into track from 2010 with new guidelines. It is mostly if not 100% public financed. Since 2012, the Government has started a new mission called National Mission on Agricultural Extension and Technology (NMAET) and it has a Sub-Mission on Agricultural Extension through which ATMA is funded. (Sulaiman: 2015)

- In comparison, **the DASP scheme** planned to encourage private-sector participation by reducing the role of the government as input supply provider and by facilitating the leasing or sale of government facilities/farms to private-sector firms. Further, the reform aimed at a phasing out government subsidies for inputs and other services, which allowed for better business conditions for the private sector. Both initiatives aimed at stimulating a vertical integration of smallholder agriculture with input suppliers and agro-processors. To this end, the programme facilitated the availability of credits for smallholders. (Sulaiman: 2015)
2. **Support private sector involvement in agricultural extension.** Both the DASP and NATP initiatives emphasized the importance of private-sector involvement in the area of technology development and technology dissemination. Recent government programmes also work towards more private sector participation. However, yet most of these government initiatives focus on public sector only. (Sulaiman: 2015)
  3. **Support participation of civil society:** The DASP and NATP schemes planned to institutionalise partnerships between public institutions and civil society in order to enhance the knowledge base and thus the quality of extension services. This was initiated mainly through contracting-out arrangements. (Raabe: 2008). Same as with private sector involvement, these linkages remained relatively limited (Sulaiman: 2015).  
**Capacity building:** The DASP scheme supported state agricultural universities, the State Institute for Rural Development, and the National Institute of Agriculture Extension Management, called MANAGE, in providing training of extension workers. These institutions offer professional skill training of extension staff across the line departments and the agricultural science centres (Krishi Vigyan Kendras).
  4. The NATP sought to improve the intensity, efficiency, and effectiveness of the public agricultural research system by strengthening the capacity of scientists to develop new, productivity-improving technologies that improve the performance of production systems. To this end, the NATP sponsored competitive grant programmes for collaborative agro-ecological research. (Raabe: 2008)

Although these reform initiatives have been piloted and scaled up across the country, implementation bottlenecks have emerged because of limited qualified manpower, insufficient technical and financial support, and a weak framework and coordination for public-private partnerships (Ferroni: 2011). Recognising these bottlenecks, the Government has considerably increased ATMA's funding over the last two years (Sulaiman: 2015).

### 3 Stakeholders of the country RAS system

This chapter analyses the stakeholders of the Indian country RAS system. It starts with a description of the public extension system, then gives an overview of selected private agencies, and concludes with a discussion about the involvement of civil society organisations. The tables below provide a) an overview of the major stakeholders and their interactions, and b) information about each stakeholder's relevance regarding to information provision to farmers.

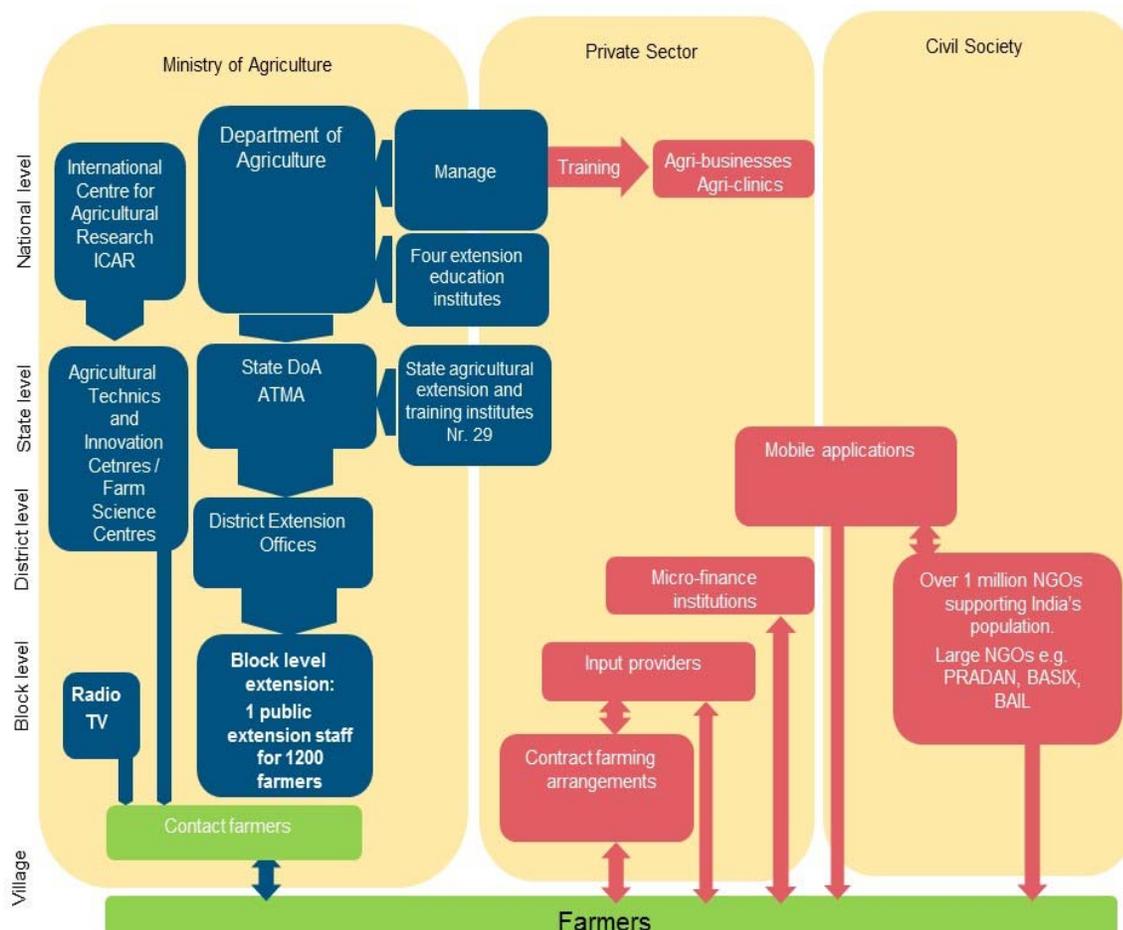


Figure 1: Overview of the country RAS system: blue = public institutions / green = farmers / red = private agencies and civil society organisations / yellow = categories of actors (Ministry of agriculture/private sector/civil society). (Author's own figure)

The following table bases on 51,770 farm household samples and indicates the relevance of the diverse stakeholders regarding to information transfer to farmers:

- The table shows that only 40% of the farmers access agricultural information from any source. 60% of the assessed farmers indicated that they did not access any agricultural information at all.
- The table shows that small scale farmers basically access less information than large scale farmers (38.2% compared to 53.6%)
- The relevance of diverse information source is as follows:
  1. Main source of information is **mass media**: About 30% of farmers access agricultural information from mass media (TV, newspaper, radio)
  2. Second important source of information are **private sector agencies** (input and output dealers, credit institutions), which provide information to 17.4% of assessed farmers. They are relatively more relevant for large scale farmers than for small scale farmers.

3. **Experienced / progressive farmers** provide information to 16.8% of assessed farmers, and are the most important source of information for small scale farmers.
4. **Public extension workers** provide information to 8.6% of assessed farmers.
5. **Civil society organisations (cooperatives and NGOs)** cater to 4.2% of farmers.

Sources	Farm Size			All India
	Small	Medium	Large	
Any source	38.2	51	53.6	40.5
Other progressive farmers	16	20.2	20.8	16.8
Input dealers	12.6	14.8	18.3	13.2
Radio	12.4	16.4	16.8	13.1
TV	7.7	15.3	22.4	9.4
Newspaper	6	10.3	15.9	7
Extension workers	4.8	9.8	12.4	5.8
Primary cooperative societies	3	6.2	8	3.6
Output buyers/food processors	2.1	3.6	3.4	2.3
Government demonstrations	1.7	3.4	4.6	2.1
Village fairs	2	2.4	2.38	2
Credit agencies	1.6	2.8	3.4	1.9
Others	1.6	2.1	2	1.7
Participation in training programs	0.7	1.9	2.3	0.9
Krishi Vigyan Kendras	0.6	1	1.7	0.7
Para-technicians/private agencies/NGOs	0.5	1	0.8	0.6
Farmers' study tours	0.2	0.3	0.6	0.2

*Table 1 Access to information from different sources across farm-sizes in India (percent). (Adhiguru et al. (2009), based on 51,770 samples assessed by the National Sample Survey Organisation (NSSO (2005).)*

### 3.1 The public extension system

The central department of agriculture was established after the Orissa famine in 1866. In 1905, the government of India passed a legislative order to have an agriculture director in each state to advise farmers on how to improve agricultural practices. As a planned effort during the early post-independence period, India began a community development program in 1952, followed by the national extension service in 1953. These programs educated farmers to take up improved farming methods across the country (Ghimire: 2014). Up to the 1960s and 70s, the Department of Agriculture was the main agricultural extension agency. In the early 1990s, national support has dried out and states have been left to fund their extension machinery, which has led to a considerable weakening of public sector extension system (Sulaiman: 2012). Instead, the last three decades have witnessed an increasing involvement of private sector, NGOs, community based organisations, as well as modern communication technologies.

Despite its abundant network for agricultural extension reaching from the MoA at the central level to KVKs at the local level, the present public extension system in India serves only 6% of the more than 119 million of farmers in India (Ghimire: 2014; Ferroni & Zhou: 2011).

#### Public extension providers

Today, public extension is implemented at state level through **the line agencies of the Department of Agriculture (DoA)**. Each state organises extension differently with varying programme foci (Glendenning: 2010). The majority of the state DoA operate at the district and block levels (Sulaiman: 2012). In terms of number of staff, public extension by the state DoA dominate extension provision in India. (Glendenning: 2010) In 2011, the DoA was faced with a lack of staff ready to work as extensionists: "Data from 27 states indicate that 36% of the posts are vacant in the DoA. Out of the 143,863 positions in DoA, 52,575 posts are vacant, and 91,288 posts are occupied" (Chandragowda, 2011 in Sulaiman: 2012). Latest figures on vacancies are not available (Sulaiman: 2015).

The resulting ratio of staff to farmers varies widely across the country (1:300 in Kerala, 1:2,000 in Rajasthan) as does the capacity of frontline extension staff: only 20 percent of the staff has graduated from university (Sulaiman and Holt 2002). A latest study indicates that in average, one public extensionists caters 1200 farmers (Sulaiman: 2015). Because of low operational budgets (85-97% of expenditures going to salaries), field visits took place irregularly. This is expected to change in close future with several initiatives putting resources into extension (e.g. ATMA) (Sulaiman: 2015)

Generally, public extensionists focus on the implementation of government programmes linked to subsidised inputs. (Sulaiman: 2012)

To reach out to broader populations, the MoA launched the **Mass Media Support to Agriculture Extension “Kisan Vani”** in 2004. The purpose of the programme is to inform farmers about daily market rates, weather forecasts, and specific farm activities in their area. India Radio (AIR) broadcasts the programme daily in the morning, noon, and evening. The programme has been complemented with the phone-in-programmes “Ask the Expert”, which rendered radio more interactive and locally relevant. Other programmes are broadcasted through television. Examples are:

- “*Doordarshan*,” the government television channel, currently reaches 92 percent of the Indian population and broadcasts information on agriculture.
- The DD National programme telecasts the 30-minute agricultural programme *Krishi Darshan*, in Hindi, six days a week. It covers various aspects of agriculture and related activities such as horticulture, animal husbandry, dairy and rural life.
- *Kendra’s produce* is a 30-minute, locally relevant programme in local language, and broadcast 5 days a week. (Sulaiman: 2012)

Also in 2004, the MoA initiated the “Kisan Call Centre” (KCC) scheme to provide information to farmers in their local language. Farmers could call the nation-wide toll-free number of 1800-180-1551, where the calls were picked up by agricultural graduates in 25 KCCs located across the country. From 2004 to 2010, almost 5 million calls have reached the KCCs. (Chandragowda, 2010, in Sulaiman 2012), but no assessment have been done about the effects of these calls. Currently, lack of adequate experience of fresh graduates and difficulties in contacting concerned experts staff considerable constrain the quality of KCCs (Sulaiman et al 2011a).

**The Agricultural Technology Management Agency (ATMA)** is a result of the above-mentioned decentralisation reform in public extension. The ATMA is a district coordinating agency entrusted with the role to bring together different agencies involved in agricultural extension at district level. The district ATMA includes members of the line departments, KVKs, farmers and NGOs. In consultation with farmers, the ATMA identifies local research and extension priorities and develops local problem-solving plans. After the World Bank phased out its contributions to ATMA in 2005-06, government funds were specifically allocated for ATMA to implement activities. 90% of ATMA is funded by the Central Government, 10% by the states.

*Learning: ATMA reflects a new role of public extension institutions: It coordinates diverse RAS activities and facilitates linkages between research, extension, private sector, NGOs and farmers. To reach high effectiveness, ATMA needed strong guidance from Gol and donors.*

Today, ATMA is operational in 603 districts (out of 676 Indian districts in 2014) in 28 states of India. Provision of separate staff for ATMA has brought improved attention to ATMA, which is now expected to strengthen the Indian extension system (Sulaiman: 2012).

**The Indian Council for Agricultural Research (ICAR)** is operational under the MoA and coordinates, guides, and manages research and education in agriculture. ICAR initiated two major public service initiatives:

- **Krishi Vigyan Kendras (Farm Science Centre)** are the institutionalised link between research and extension. They operate at district level and are funded by the ICAR, universities, NGOs and the state line department of agriculture. Their mandate includes promotion of locally adapted technologies through on-farm trials, demonstrations and training. In 2015, 641 KVKs are operational throughout the country, and the number is expected to increase to 751 (AESA: 2015). The effectiveness of KVKs vary considerably. Accordingly, Gowda (2012) describes KVKs as highly effective, whereas Sulaiman (2012) looks at them more sceptical: “The effective reach of KVKs in most cases is marginal mainly due to its inadequate linkages with other development agencies. Staff shortage, limited operational funding and a narrow mandate has also led to sub-optimal utilization of KVKs”

- **Agricultural Technology and Information Centres (ATICs)** are other institutions founded by ICAR with the purpose to link research with extensionists. ATICs are considered a window to the state agricultural universities to present technologies, research, and advice. Jointly with the state agricultural universities, ATICs support the state DoA with technological backstopping and advisory support.

**Effects** of the public extension system: In spite of the growing recognition of the importance of agricultural extension and increased investments into India government extension programs, extension services of the national agricultural research system have a very limited outreach: 60 percent of farmers did not access any source of information on modern technology in 2003. Of those having sourced information, over 16 % received it from nearby progressive farmers, 13% from input dealers and 13% through radio. In general, advice was often perceived as of low practical relevance. (Glendenning: 2010).

### Public capacity building institutions

Capacity building for extension workers is organised at state level, which is comparable with national level in other Asian countries (31 out of 36 Indian states have between one and almost 200 million inhabitants):

- The **National Institute for Agricultural Extension Management (MANAGE)** supports capacity development of extension professionals at the national level,
- **four Extension Education Institutes** are operational at the regional level,
- every state has a **State Agricultural Management Extension and Training Institute (SAMETI)**, whose mandate is to strengthen the capacity of mid-level and frontline extension staff (Glendenning: 2010)

Senior and mid-level extension staff are trained by the National Institute of Agricultural Extension Management (MANAGE, and its four Extension Education Institutes (EETs). Information from the district and block extension staff to the village levels is transmitted through contact farmers or para-extension workers (Glendenning: 2010).

**Effects:** The quality of service provision by these contract farmers / farmer friends and para-extension workers has not been assessed. It is thus not clear, what services they offer and how motivated they are. (Sulaiman: 2015)

*Learning: The (state) government recognises the importance of capacity building: Capacity building for extension workers of the public and private sector is institutionalised and financed with public finances. The system is organised at state level.*

*Learning: Capacity building of contact farmers is not institutionalised, although contact farmers are considered a key link in the agricultural knowledge system.*

## 3.2 Private actors in the Indian extension system

Private sector involvement in extension is advancing rapidly. A range of companies are involved in agricultural extension, including seed and input companies, distributors and agro-dealers, food processors and retailers, and mobile operators. The GoI recognises this growing importance of private extension providers and supports several programmes to enhance private sector involvement in agricultural extension. As result, embedded services, public private partnerships and contract farming arrangements are increasingly important vehicles for agricultural extension (Ferroni et al.: 2011).

## Public initiatives to foster private sector involvement in agricultural extension

**Private Agri-Clinics and Agri-Business Centres (ACABCs)** provide embedded services to farmers through technically trained agricultural graduates at the village level, known as “agripreneurs.” ACABCs are privately managed and operate in various parts of the country with the goal:

- to supplement the efforts of government extension system;
- to provide expert services and advice to farmers
- to provide inputs and farm equipment to farmers
- to provide gainful employment to agricultural graduates in the agricultural sector.

*Learning: Affirmative government action is needed, if private sector should complement the public extension system in an ecological and poverty-oriented way.*

To support the establishment of such private ACABC, the National Bank for Agriculture and Rural Development and the public institution MANAGE offer a two-month training in agri-business development for graduates of the agricultural university. The training takes place in extension institutions of the public or private sector. The entire training fee is borne by the Government of India. After the training, the graduates are expected to set up Agri-Clinics and Agri-Business Centres based on bank finances, whereas the central government provides 25 percent of the cost as a subsidy. In addition, the states have adopted the approach and add their own additional subsidies for Agri-Clinic implementation. (Manage: 2014; FYP: 2012)

**Outreach:** “Until 2012, 27,752 graduates have been trained leading to the establishment of 9863 ACABCs in various parts of the country” (ACABC: 2012 in Sulaiman: 2012). Farmers who have availed services from these centres have benefited by way of increased productivity. However, graduates still face problems to availing bank finances, such as high rates of interest, limited interest of the bank to invest, and the need for collaterals (Sulaiman: 2012).

**Diploma course on agricultural extension for input dealers:** MANAGE has started a diploma course for private input providers. The diploma covers four modules: agronomy, extension and communication methods, individual and business development, and laws related to seeds, fertilizers, agrochemicals and consumer protection. A list of trained input dealers by district is available on the MANAGE website. The Diploma Course on Agricultural Extension for input dealers is imparted through distance education mode with the goal to qualify private, local agricultural input dealer to provide advice on local crop production and protection technologies (Manage, 2012; Ferroni et al. (2011)).

*Learning: In order to increase the outreach of the extension system, a state institution accredits and trains private input dealers to complement the government extension system.*

**Outreach:** The programme is currently implemented in Andhra Pradesh, Tamil Nadu and Maharashtra. So far, 2164 input dealers have been trained and certified under this scheme, and the Government is trying to increase this number (MANAGE, 2012).

## Embedded services

There are an estimated 282,000 input dealers in India. They have every interest to offer quality services to their farmer clients. Although MANAGE offers the above mentioned diploma course for input dealers, so far, only a minor fraction of all input dealers have been trained (Ferroni et al.: 2011).

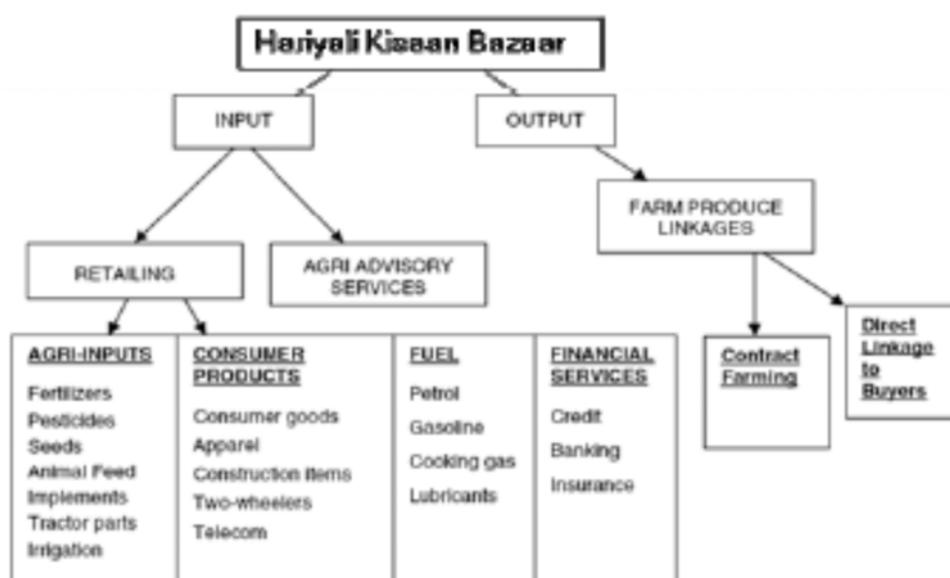
Another way for input dealers to get training is to collaborate with one of the large private input sales and extension provision schemes. There is a number of such schemes existing in India today, e.g.:

- **The Hariyali Kisaan Bazaar** is run by the DCM Shriram Consolidated Ltd. and offers a comprehensive package of agri-inputs, extension, credit, and produce, fuel, mobile phones – all under one roof. *Hariyali Kisaan Bazaar* operates more than marketing 300 rural retail stores across eight states following the model depicted in Figure 2. Each rural store caters to 15,000 or more farmers (Ferroni et al.: 2011). This system collapsed in 2013-14 because DCM Group shut the operations completely due mainly due to less footfall and huge losses. (Sulaiman: 2015)

- *Tata Kisan Sansar* centres by Tata Chemicals Ltd. offers extension such as soil testing, remote diagnostics, house brands for seeds, cattle feed, pesticides and sprayers. There are currently 32 hubs catering to 681 *Tata Kisan Sansars* covering approximately 2.7 million farmers in some 22,000 villages across 88 districts in different parts of the country (Ferroni et al.: 2011).
- *Godrej Agrovet* is a chain of rural outlets offering agricultural equipment, technical services, soil and water testing, veterinary, financial services, and pharmaceuticals. The Agrovet chain employs about 1600 workers and operates 27 service centres across the country, each serving some 20,000 farmers. (Afaqs: 2015).

*Learning: Most of the private input and service providers offer multifunctional services. This is an economically viable reaction to farmers' demand.*

*Learning: Private initiatives operate as long as they are economically viable and else withdraw their activities: a number of large private initiatives already withdraw from extension.*



– *Figure 2: Hariyali Business Model (Bell et al. (2007) in Ferroni et al. (2011))*

Effects: These large input providers offer comprehensive services including inputs, credits and marketing activities. Glendenning et al. (2010) states that the impact of these services is yet widely unassessed. Sulaiman et al. (2005) analysed such schemes with focus on *Mahindra Krishi Vihar* and offer the following results:

- farmers are willing to pay for an integrated set of services that gives them access to quality inputs;
- farmers working with a private extension service provider can substantially increase their yields and farm income;
- the increases are attributable to field-specific technical advice on application of the right inputs at the right stage of crop growth;
- *Mahindra Krishi Vihar* has been able to develop a sustainable and profitable business selling extension services related to both production technology and linkages to markets;
- the apparent success of the *Mahindra Krishi Vihar* model is in some measure due its flexible 'learning by doing' approach; and
- a private extension approach of this type focuses mainly on medium and larger-scale farmers.
- Despite good experiences, eventually the model failed and the company withdrew from extension provision. (Sulaiman et al.: 2005).

While writing the study at hand it became evident that the number of such private schemes is highly fluctuating: they are established fast, but also withdraw from their activities in case they don't remain economically viable. That's why the study can't provide figures about the current outreach.

## Public private partnerships (PPP)

Although public private partnerships for extension are abound, literature and studies about their effects are still limited. Ferroni & Zhou (2011) provide the following example:

The agro-chemical business Danuka group has worked since 2001 with the Government of Madhya Pradesh and with MANAGE. The topics for the PPP include soil testing, seed treatment, quality seed provision, diagnosis of pests and diseases, safe and effective crop protection, farmer organisation and market research. Through this partnership agricultural extension has been largely privatised in the region. Productivity has been increased to the point that the national productivity council awarded the district with the best productivity award in 2004 (Ferroni & Zhou: 2011).

Another example are the 100 PPPs projects that have been launched so far in the frame of the national Small Business Innovative Research Initiative and the Biotechnology Industry Partnership Programme. These PPPs resulted in six Indian patents and the development of 16 technologies in agriculture such as GM crops including insect-resistant chickpea, rice, or drought-tolerant groundnut, sunflower and mustard (FYP: 2012).

*Learning: Public private partnerships in extension in India led to a privatisation of extension. The role of the state is financing research and mandating private service providers.*

## Contract farming schemes

The role of contract farming is growing in Indian agriculture. There are only fragmented information about contract farming arrangement and it is not possible to indicate the total land area under contract schemes. However, contract farming is seen as the major way how aggregators and processors of products impart extension advice, and its importance is growing, in particular for middle and large scale farmers (Ferroni et al.: 2011). Experience of these arrangements has been generally mixed. Sinh (2005) states that “in order to make contract farming an effective development tool, strong mechanisms must be in place to monitor contracts and ensure that growers — the more vulnerable partners — are not exploited”.

The literature on contract farming is large and varies in its opinions. An IFPRI study on contract farming for poultry production in Andhra Pradesh claims that

- contract production is more efficient than non-contract production
- the efficiency surplus is largely appropriated by the processor
- contract growers gain from contracting not in terms of higher returns but in terms of lower risk and higher expected returns.
- contract farming is useful institutional arrangement for the supply of credit, insurance and technology to farmers
- contract growers chosen by the processor have poor prospects compared to independent growers.
- Thanks to improved production inputs and access to credits (offered by the contract company), these relatively poor contract growers achieve incomes comparable to that of independent growers (Ramaswami et al.: 2006).

The following table provides an overview of some exemplary contract farming arrangements (Ferroni and Zhou: 2011)

*Learning: Contract farming is a promising scheme to deliver effective extension to farmer in an economically viable way. To avoid negative effects of contracts on poor farmers, a policy framework to mitigate ecological and social risks, as well as a monitoring mechanism must be in place. It is in the public interest (Gov, donor) to support such framework.*

*Table 2): Overview of selected contract farming schemes (adapted from Ferroni and Zhou: 2011)*

Company	Outreach	Company's offer	Farmers' offer
Hindustan Lever Ltd., Rallis and ICICI	Madhya Pradesh, 2000 suppliers (Barth (2006))	<ul style="list-style-type: none"> <li>- Rallis: provides agri-inputs and know-how for free</li> <li>- ICICI: provides credit to farmers, weather index based insurance product</li> <li>- HLL: assures output markets and a floor price</li> <li>- Organisation of produce bulking</li> </ul>	Defined quantity of wheat at a predefined price
PepsiCo	Nine states, 30,000 farmers in 2012 <sup>2</sup>	<ul style="list-style-type: none"> <li>- technology transfer through trained extension personnel,</li> <li>- agricultural implements free of charge,</li> <li>- quality farm inputs on credit</li> <li>- PepsiCo receives an agreed quantity of quality produce from farmers at a pre-defined price</li> </ul>	Defined quantity of tomato, basmati rice, chillies, groundnuts at a predefined price
Adani Agrifresh	Himachal Pradesh, 4000 farmers	<ul style="list-style-type: none"> <li>- post-harvest practices, cold chain support,</li> <li>- assured prices (generally 5 percent above the market price), announced on a weekly basis for different grades of apples</li> </ul>	Apples for Delhi market
FieldFresh Foods Private Ltd	Maharashtra and Punjab, 3500 farmers	<ul style="list-style-type: none"> <li>- guarantee to purchase produce grown within a specified quality range</li> <li>- predefined prices for given quality specifications</li> <li>- Detailed production protocols</li> <li>- Training on adequate input use</li> <li>- Lead farmers recruit and mentor farmers, manage demonstration plots, provide advisory services and post-harvest support.</li> </ul>	Farmers deliver baby-corn to Fieldfresh

A large number of such private initiatives are operating. The reason for the growing importance of contract farming arrangement is seen in the fact that companies face significant challenges to access agricultural produce of a high number of small farms. As mentioned above, the benefits of these arrangements for farmers discussed controversy: On the one hand, farmers benefit from access to inputs and credits, assured markets, possibly reduced risks and learning on how to comply with (international) standards and norms. On the other hand, farmers face increased dependency of the company, have to understand and deal with contracts elaborated and proposed by the company, and not seldom sell their produce to lower prices than the market price.

Whether farmers are able to use contract farming arrangement to their benefit, depends on farmers' capacities and power to influence contract elaboration and implementation, and need to be analysed separately.

### 3.3 NGOs and social entrepreneurs

The Non-Profit Sector in India presents an estimate of 1.2 million NGOs in India, most of them are small organisations in rural areas. They are thought to engage about 20 million persons (Pria et al.: 2012). Regarding to agricultural extension, NGOs are considered an important sources of information for small farmers in India (Ferroni & Zhou: 2011).

Their sizes range from very small local entities to large multistate organisations, whereas most of them access external donor funds. Typically, their social commitment is high, and many NGOs dedicate themselves to forming self-help groups or farmer-based organisations. However, their number is insufficient to cover all farmers seeking advice, they yet remain a complement to the relatively larger public extension system. Examples for large NGOs or rather social entrepreneurs are Basix, PRADAN and BAIF. They operate in numerous states (Figure 3), have been active for many years, and work according to established approaches

*Learning: In India, NGOs play a considerable role for introducing innovative and inclusive approaches into the RAS system. The pluralistic sources of finances allow these NGOs to offer a range of services on a relatively large scale.*

<sup>2</sup> Source: <http://www.potatopro.com/news/2012/30000-indian-farmers-farming-pepsico-next-year>

and methods. Although the subsequent figures might give the impression, that these NGOs work everywhere, their outreach is limited to selected blocks and districts (Sulaiman: 2015)

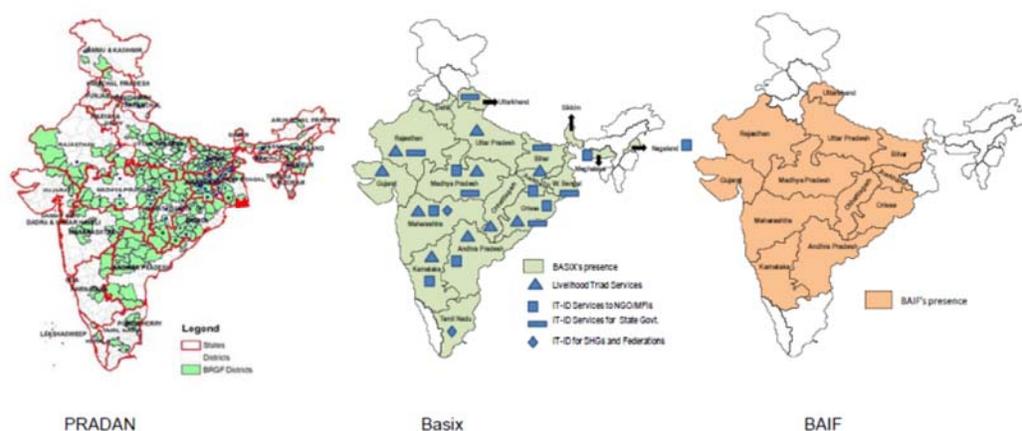


Figure 3: Operational Areas of Pradan, Basix and Baif (Ferroni & Zhou: 2011)

**Basix** is a microfinance institution with more than 3.5 million customers, of whom over 90 percent are rural poor households. Basix operates in 17 states, 223 districts and covers over 39,000 villages. It employs over 10,000 staff of which 80 percent work in small towns and villages. (Basix: 2015; Ferroni & Zhou: 2011) Basix provides business development and extension services, and financial products for farmers under one umbrella. It operates across eight crops as well as dairy production. (Basix: 2015)

**BAIF** is a development research foundation working in agriculture and livestock development. BAIF employs over 3000 staff, operates about 750 centres and reaches out to 2.5 million farmers that are mostly organised in cooperatives.

**Pradan** works across eight states of India through 41 teams of which each comprises ten professionals. PRADAN reaches out to about 200,000 families in over 4000 villages in 2013-14. PRADAN collaborates with a range of institutions such as government agencies, banks, market institutions, panchayats, or research bodies. (Pradan: 2014)

**Effects:** Ferroni & Zhou (2012) consider these huge NGOs as spearheads for needs and demand-driven extension. They together are expected to reach a considerable number of farmers, organise farmer and women groups and have a keen eye for innovations and markets. As a matter of fact, their outreach and activities depend on funding from public sector and donors, which is expected to be available, as long as poverty, natural disasters and inequality exist in Indian rural areas.

However, Swanson (2011) criticises that with expanded donor focus on agriculture, entrepreneurial NGOs may hire away the best public agricultural extension advisors, since these emerging new agricultural NGOs successfully compete for and carry out donor-driven extension projects.

### 3.4 Cooperatives

The cooperative sector in India has a long history, has currently estimated 230 million members, and is significantly involved in agricultural production support: Cooperatives offer the largest credit network and advance more credits in the Indian agricultural sector than commercial banks. Further, cooperatives command over 35% of the national markets for fertilizers and in the production of sugar and cotton, cooperatives have a share of 58%, respectively 60%.

Cooperatives process, market and distribute 50% of the edible oil and the country's largest producer of milk is the Dairy cooperative. The rapid growth of the cooperative sector has evoked a supportive climate for the development of new cooperatives and thus the opportunity for diversification. Cooperatives are thus considered "to have immense potential to deliver goods and services in areas where both the state and the private sector have failed." (Sociology Guide: 2015) Despite cooperatives' high potential to reach out to farmers, the above

*Learning: The large network of cooperatives have a great potential to reach out to farmers and to link them to markets.*

shown Table 1 on the relevance of diverse RAS stakeholders indicates that cooperatives and NGOs together deliver agricultural information to only 4.2% of the assessed farmers. Thus, compared to other RAS stakeholders, cooperatives have yet a limited outreach to farmers.

### 3.5 Mobile applications

Mobile applications for agricultural extension are growing, but still have a great potential to be further developed and spread. India's extension system includes several providers of mobile applications for agriculture including non-profit organisations and commercial agencies. Despite the range of service providers operating in the country, the number of farmers using mobile applications remains limited. Reasons are seen in limited access to internet, still not fully covered mobile telephone access, but mainly illiteracy and lack of voice based applications (Ferroni & Zhou: 2011).

The following table gives an overview of some major mobile application providers. The table is based on information given by Ferroni & Zhou (2011).

#### Learning:

- Voice messages are crucial to reach out to poor farmers.
- Phone applications have a higher outreach than internet applications.
- Interactive radio programmes where farmers can reply by mobile phones are a simple service that is attractive to farmers.

Service provider	Technical data	Services	Outreach
<b>Avaaj Otalo</b> (non-profit)	<ul style="list-style-type: none"> <li>– Voice based system</li> <li>– Services accessible on simple phones</li> <li>– Toll-free number (sponsored by the Development Support Centre and donors)</li> </ul>	<ul style="list-style-type: none"> <li>– Access to past radio broadcasts</li> <li>– Announcement board</li> <li>– Discussion forum</li> <li>– Expert advice</li> </ul>	Gujarat: in total 3500 users (farmers)
<b>Digital Green</b> (non-profit; Bill and Melinda Gates foundation & Deshpande Foundation) In partnership with large organisations (Pradan, BAIF, Gov. Institutions)	<ul style="list-style-type: none"> <li>– Digital video</li> <li>– Not cell phone driven</li> <li>– Accessible through digital library</li> <li>– Offline operation possible</li> </ul>	<ul style="list-style-type: none"> <li>– 1200 videos on agricultural techniques</li> </ul>	42'000 users
Nokia Life Tools (commercial)	<ul style="list-style-type: none"> <li>– Paid services on low-cost Nokia phones</li> <li>– Services available in 10 languages in two categories</li> <li>– Basic: Rs 30/month</li> <li>– Premium: Rs 60/month</li> </ul>	<ul style="list-style-type: none"> <li>– commodity prices for crops chosen by producers</li> <li>– seed and other input prices in local markets</li> <li>– weather forecast</li> <li>– agricultural and animal husbandry tips and techniques</li> </ul>	No outreach figures available
IFFCO Kisan Sanchar Limited (Bharti Airtel and Indian Farmers Fertilizer Cooperative Ltd) (Commercial)	<ul style="list-style-type: none"> <li>– Phone application</li> <li>– free voice messages</li> <li>– in 10 languages</li> <li>– helpline queries: 1RS/minute</li> <li>– One-time activation fee</li> </ul>	<ul style="list-style-type: none"> <li>– 5 voice messages daily: information on market prices, farming and animal husbandry techniques, fertilizer,</li> <li>– weather forecasts</li> <li>– 24h helpline</li> </ul>	Three million activated SIM cards 700,000 farmers were active in 2010 Good ratings in a quality assessment
Kisan Call Centres (DoA, MoA) (public service)	<ul style="list-style-type: none"> <li>– In 22 languages</li> <li>– Toll-free calls</li> </ul>	<ul style="list-style-type: none"> <li>– Weather forecast</li> <li>– Information on credit sources, quality inputs, crop insurances, fertiliser application, pest management</li> </ul>	About five million calls answered by Kisan Call Centres from 2004-2005 (Chandragowda, 2010, in Sulaiman 2012)
Reuters Market Light (commercial sms service)	<ul style="list-style-type: none"> <li>– SMS service</li> <li>– Low end phones</li> </ul>	<ul style="list-style-type: none"> <li>News on agricultural policies</li> <li>Market information for 1400 market places and 440 crops</li> <li>Advice for each stage of the farming cycle</li> <li>Weather forecast in 2800 locations</li> </ul>	1.4 million farmers in 18 states of India; 5-25% income increase of users

Table 3: Exemplary service providers of mobile applications (based on information of Ferroni & Zhou (2011))

## 4 Pluralistic dimension and agricultural knowledge and innovation system

### 4.1 Pluralistic dimension

The Indian RAS system is noticeably pluralistic since there is a range of sources and providers for extension, without one dominating the system. The below actors depicted in the table below all considerably contribute to the overall extension system.

Source of finances	Service Providers					
	Public sector	Private Sector			Civil Society	
		Input supplier	Processors / traders	Private RAS providers	NGO	Farmer Cooperatives
Public	ATMA, KVK, MANAGE, Kisan Call Centre, ATMA	MANAGE diploma courses, Public input subsidies to ABACS			PRADAN	
NGO/Donors	ATMA			Mobile applications	BAIL PRADAN BASIX	
Private companies		Agribusinesses	Contract farming schemes	Agriclinics, Mobile applications	PRADAN BASIX	
Farmers / Farmers Cooperatives	Indian Dairy Cooperative					230 million members of Indian agricultural cooperatives <sup>3</sup>

Table 4: Pluralistic dimension of the Indian country extension system (adapted from Anderson and Feder (2004))

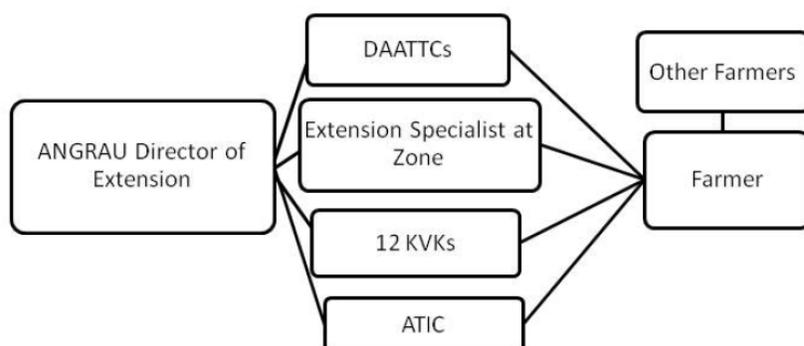
### 4.2 Agricultural knowledge and innovation system

The central autonomous Indian Council for Agricultural Research (ICAR) operates 40 Agriculture Technology Information Centres (ATICs) and 569 district-level Krishi Vigyan Kendras (KVKs), or farm science centres. Additionally, each state has a state agricultural university that provides extension and training activities. However, activities of the state universities vary from state to state. E.g. in Andhra Pradesh, the state agricultural university (ANGRAU), has organized District Agricultural Advisory Transfer of Technology Centres (DAATTCs) at the district level. Each of these centres carry out diagnostic visits to farmers on a weekly basis. Twice a year, zonal research meetings take place, with the goal that extension workers at the DAATTC, farmers, and state university scientists meet to identify research needs. Despite the zonal research meetings, only limited feedback on farmers' needs is included to the knowledge system. Reasons for that are that these meetings rarely take place, farmers' participation is low, and meetings tend to exclude farmers living away from research centres. (Glendenning: 2010)

#### Learning:

- Research-Extension-Farmer meetings as a mechanism to include farmer's information needs into research.
- Major challenge: Diverging national research and extension plan with farmers' requirements for knowledge.

<sup>3</sup> Source: Sociology Guide: 2015



Source: Authors.

Note: ANGRAU = Andhra Pradesh State Agricultural University, DAATTC = District Agricultural Advisory Transfer of Technology, KVK = Krishi Vigyan Kendra, ATIC = Agriculture Technology Information Centres.

Figure 4: Information flow in Andhra Pradesh state agricultural university (Source: Glendenning et al. 2010)

In general, staff of the DoA receive their information from various sources, including the research stations of ICAR. However, information flows from the universities and research institutes to the KVKs and other extension providers are largely linear, well known to be weak and tend to be top-down. (Glendenning: 2010) Since feedback from extension to research is limited, research agendas do not reflect extension experiences (Sulaiman and Holt 2002). Information content still reflects centralised agendas, thus focuses on crop production and rarely includes local information needs such as postharvest information and market access. This is seen as a key challenge in the state DoA. Glendenning (2010) sees a need to encompass the wider definition of extension and provide more opportunities to include farmers' feedback into the agricultural knowledge system." (Glendenning: 2010)

In addition to internally weak information flows, the knowledge use and generation of the DoA tends to be isolated from other extension actors, such as private actors, NGOs or even state government line departments, such as animal husbandry, fisheries, and forestry. (Glendenning: 2010)

Ghimire (2014) describes these weak research - extension - farmers linkages, too. Ghimire (2014) sees a role of donors to provide knowhow and expertise on how to manage the change from top down information flows to a more client oriented learning.

## 5 Effectiveness of the RAS system

Ghimire (2014) claims that the traditional agricultural extension programmes in India have not yet included a consistent impact evaluation system. The reasons are manifold and include inadequate opportunities for extension agents to improve their evaluation capacities or low attention of the government to commit time and resources for impact evaluation. That is why, impact evaluations that determine socioeconomic change in communities are still limited to donor supported projects. (Ghimire: 2014) The following information on the effectiveness of the RAS system applies thus only punctually and does not base on sufficient data.

*Learning: Monitoring and impact assessment is a state function to improve effectiveness of a country RAS system.*

### Outreach

A key issue regarding the effectiveness of the Indian RAS system is its outreach to farmers. According to Adhiguru et al. (2009), only 40% of farmers have access to information relevant to agriculture. Despite its abundant network for agricultural extension reaching from the MoA at the central level to KVKs at the local level, the public extension system in India caters to only 6% of the more than 119 million of Indian farmers (Ghimire: 2014; Ferroni & Zhou: 2011; Adhiguru et al.: 2009).

Glendemming (2011) brings in the argument that low outreach is due to low staff numbers and low operational budgets: 85–97% of expenditures going to salaries. This limits the ability of DoA staff to visit farmer fields (Sulaiman and van den Ban (2002) in Glendemming (2011)). Sulaiman and Holt (2002) found that extension workers consider remote areas to be “punishment postings”; 50% of these posts are vacant, and the capabilities of the extension workers there are questionable.

Due to the low coverage and often low quality of services, the productive potential of small farmers could yet considerably be multiplied with the right technologies, services, mentoring and access to markets. However, Ferroni & Zhou (2011) claim that this is far from happening at scale.

*Learning: Progressive farmers and input dealers are recognised as a relevant source of information for poor farmers. Building their capacities increases the outreach of the extension system.*

## Quality of extension

The quality of RAS is as crucial as its outreach. Ghimire (2014) states that in India, many small scale-farmers feel underserved and disengaged from their extension services. In particular, farmer specific information needs seem often not reflected in the extension services offered. As reason for low quality services of public extension agents, Ghimire (2014) claims that “agents in emerging countries have grown up in an environment where there is neither reward for dedicated service to farmers, nor any serious disciplinary action for sluggish performance.” In the public extension approach, farmers is at the end of the information chain with little opportunity to provide feedback. Monitoring and evaluation of staff is top-down, with little to no role for farmers. (Anderson, Feder, and Ganguly (2006) in Glendenning (2012)).

Furthermore, in India, a large number of schemes and programmes are imposed from the centre and states to district government centres. Extension staff thus tend to perform public duties not related to extension, such as election or census duties (Ferroni & Zhou: 2012).

This is reflected in an assessment of Adhiguru et al. (2009) who show that other progressive farmers and input dealers are by far more relevant sources of information than government extension workers, in particular it comes to adoption of provided information. The study indicates that the adoption rate of information provided by other progressive farmers is highest compared to other source of information.

*Learning: Public extension workers have to cover a range of services, not only for extension. Depending on state priorities, public agricultural extension delivery is neglected.*

*Table 5 Efficiency of sources of information. (Adhiguru et al.2009; based on 51,770 samples assessed by NSSO: 2005)*

Sl No.	Sources	Percentage of total households			Percentage of accessing households	
		Access	Trial	Adopt	Trial	Adopt
1	Participation in training programs	0.9	0.6	0.6	66.1	64.5
2	<i>Krishi Vigyan Kendras</i>	0.7	0.5	0.5	66.9	66.2
3	Extension workers	5.8	3.8	3.6	65.4	62.5
4	TV	9.4	5.0	5.0	53.3	53.1
5	Radio	13.1	7.4	7.1	56.4	54.5
6	Newspapers	7.0	3.8	3.8	54.1	53.8
7	Village fairs	2.0	1.0	1.0	47.2	48.0
8	Govt. demonstrations	2.1	1.2	1.2	59.2	60.4
9	Input dealers	13.2	10.7	10.8	81.5	81.7
10	Other progressive farmers	16.8	13.9	14.3	82.8	85.1
11	Farmers' study tours	0.2	0.1	0.1	48.8	52.3
12	Para-technician/private agency/NGOs	0.6	0.3	0.3	55.5	56.6
13	Primary cooperative societies	3.6	2.5	2.5	70.0	68.4
14	Output buyers/food processors	2.3	1.6	1.5	67.6	62.8
15	Credit agencies	1.9	1.0	0.9	51.4	49.0
16	Others	1.7	1.1	1.2	67.5	68.6

## Inclusiveness

The Indian five-year development plan (2012) pronounces that balance of power in rural India is heavily weighed against the landless and the poor. It claims that without massive mobilisation of the rural poor a deepening of democratic governance in rural activities will not take place (FYP: 2012). These constraints are further compounded for tribal and women farmers. Since more men than women move out of agriculture, there is a shift towards a feminisation of agriculture. These women farmers typically have little access to land, agricultural inputs and other services. (FYP: 2012)

Generally, Adhiguru et al. (2009) found that public extension provision, and information provision through newspaper, TV, and input dealers are particularly biased towards large scale farmers (see Table 1).

Regarding public extension services, there are new approaches to render the public extension system more inclusive. A revision of the ATMA system foresees farmer-to-farmer extension, strives to increase the number of focal points from three to five in every block, and provides guidelines to reach a 50% participation of small and marginal farmers in learning events (Glendenning: 2010). Further, the ATMA guidelines insist that 30% beneficiaries of ATMA programmes have to be women (Sulaiman: 2015). However, only effective monitoring and evaluation of these components of ATMA will encourage real outreach of extension to the poor segment of the farming community. (Glendenning: 2010)

Adhiguru et al. (2009) indicates that for small scale farmers, 'other progressive farmers' and radio broadcasts are the most popular sources of information. This is explained with the relatively higher cost of information acquisition from other sources, and with a potential bias of private agencies towards large scale farmers.

Complementary, due to the broad access to radio by rural population, radio broadcasts appear to be one of the important source of information for small scale farmers, too (Adhiguru et al.: 2009).

Civil society organisations, in particular NGOs are expected to have a specific focus on small scale farmers or female farmers. In the above-mentioned study this group plays with around 4% of farmers provided with information a limited role when it comes to the outreach to farmers. (Adhiguru et al. 2009)

*Learning: Role of the government to coordinate and to reinforce public interests: GoI jointly with donors issues guidelines to strengthen inclusiveness of the extension system.*

## 6 Conclusions: Innovation and learning from the Chinese RAS system

### Learning regarding the role of the state

Looking at the Indian RAS system one can derive several learnings regarding the role of the state in a country extension system.

- ATMA **coordinates RAS activities** including those of private and civil society institutions. It facilitates linkages between research, extension, private sector, NGOs and farmers. By recognising all actors as relevant parts of the extension system, ATMA as coordination unit has the potential to increase the pluralism and outreach of the RAS system.
- Another role the government is reflected in the government programme to **build capacities and accreditate private input providers**, here in the form of a certificate course for input suppliers. With such certificate course, the GoI supports pluralistic service provision and increases the RAS system's potential to reach out to a greater number of farmers.
- **Strengthen inclusiveness of the RAS system**: The MoA issues guidelines that representation of poor in ATMA trainings must be 50%, and representation of women 30%. Such guidelines are found to increase the inclusiveness of the system. In order to have an impact, it was shown that **guidelines must be well monitored**. Where monitoring efforts lack, the system in general risks to be less inclusive.
- **Support public private partnerships by** mandating private service providers to jump in where public service provision is weak, or to finance research programmes. Experiences in India show that yet mainly private interests drive these partnerships. Hence, in order to use PPPs for public interests such as poverty reduction or ecologically sustainable agriculture, the influence of the state need to be reinforced.
- **The role of the state in contract farming** is generally weak in India. Contract farming is a promising scheme to deliver services to farmer in an economically sustainable way. However, to avoid negative effects of contracts on poor farmers or on the environment, **a monitoring and farmer supporting mechanism must be in place**. It is here, where the government (or donors) may jump in.

### Learning regarding the agricultural knowledge and innovation systems

Ideally extension needs to be linked to the other actors in the Agricultural Innovation System. In India, knowledge transfer is still one-sided from research to extension and yet, no feedback mechanism between farmers, extension workers and research institutions has been institutionalised. This increases the risk that public extension services do not meet farmers' needs, which accounts for the often mentioned low quality services. The reason for such one-sided information provision, respectively the weak linkages between the diverse actors is seen in the **overall difficulty to dovetail national extension and research plans with local needs**.

### Learning regarding capacity building for extension workers

Generally, capacity building for private and public extension workers is institutionalised and financed by the GoI. This education system for extension is decentralised to the state level, which is comparable with the national level of smaller countries. It was found that experienced farmers or input suppliers often build the last mile in the Indian extension system. Thus, by building capacities of input providers, the GoI make use of a relevant opportunity to improve the outreach and quality of the extension system.

Capacity development of experienced farmers would have the same effect. Yet, experienced farmers are not included into the public capacity building system, although such activity could considerably increase the outreach and inclusiveness of the extension system.

### Pluralistic dimension of the RAS system

By establishing ATMA as a coordinating entity for extension services, the government affirmatively supports pluralistic extension service delivery. This particularly successful in regions where private agencies have an interest to involve in RAS and where public extension workers are available. In remote areas or areas with low

agricultural potential, neither the government (lack of extension workers) nor the private sector is sufficiently represented. There, publicly financed civil society organisations or public extension institutions are the single RAS providers. The pluralistic dimension of a RAS system usually depends on the scale of observation and decreases with the observed area. Particularly in remote areas with less agricultural potential affirmative government action to support pluralistic service delivery, or public finances for RAS are required.

### **Multifunctional services – key for economic viability of service provision and demand orientation**

The private sector as well as civil society organisations consider holistic services as a meaningful approach to RAS – either from an economic point of view, or/and from a demand orientation perspective:

Most of the private service providers recognised that multifunctional or holistic service delivery have a potential to become economically viable in areas with a certain agricultural potential. Most of them offer combined services in selected areas.

Also NGOs strive to offer multifunctional services; their goal is to best react on farmers' demands. The large NGOs operating in India play a considerable role for piloting innovative and inclusive approaches of holistic RAS delivery, such as combined financial and advisory services. This is possibly because they collaborate and receive funds from various institutions, which endows them to offer a diversity of services supported by these multitude of partners.

### **Mobile applications with voice messages contribute to an increased outreach of RAS to poor producers**

India with its diversity of mobile services shows that mobile applications have then a considerable potential to reach out to a large number of farmers. The inclusion of voice messages significantly enhances the use of these applications by poor farmers. Further, India shows that farmers are eager to access not only current, but also past radio programme. The opportunity to reply broadcasts allows farmers to listen the broadcasts when they are at home, and to repeat relevant contents if necessary. Finally yet importantly, the experience of India shows that if interactive services are available (services that offer producers an opportunity to put questions to experts or other producers), they are used and appreciated by a large number of farmers.

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## 7 References

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