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A Critical Review and SWOT Analysis of Important Extension Agencies in India for Improving Extension Management

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ABSTRACT

The agricultural extension system in India has the daunting task of serving about 146.45 million farm families. Public extension systems comprising KVKs, ATMA, State Line Departments, SAUs and ICAR Institutes have been playing a pivotal role in extending extension services; of late, private players like input companies, credit and insurance firms, Corporate Social Responsibility units, NGOs, farmers' associations (FBOs/FPOs) and commodity boards (Rubber, Coffee, *etc*.) have made a significant impact in this area. Despite such a vast network of public and private extension agencies, there is a wide gap in service delivery and extension education interventions. All these extension agencies have their strength and weaknesses but also hold promising dynamism for future challenges. As agricultural extension will be a very important determinant of future agricultural growth, the assessment of SWOT analysis of different extension agencies engaged in delivering extension services in India is imperative.

Key words: Critical review, Extension agencies, Extension system, SWOT analysis.

India had more than 146 million land holdings during 2015-16, out of which about 86 per cent were small and marginal farmers having a land holding of less than 2 ha (DAC and FW 2020). The number of land holdings has been continuously increasing during 2010-11 and 2015-16 compared to 2005-06, while marginal farmers were the only category where the proportion of farmers constantly increased (Table 1). Although agricultural extension in India has evolved over time while facing and combating various challenges (Dubey *et al.* 2011), ensuring farmers' welfare through technological backstopping and extension advisories is a gigantic task because of farmers' huge number and immense diversity in crops and activities undertaken in our country. India has a unique National Agricultural Research and Extension System (NARES) to address farmers' specific needs. A functional depiction of NARES (Fig 1) reflects a very strong dependence of the extension system on the research system for technological backstopping.

Various extension agencies exist and complement each other in the extension system in India to make it able to work efficiently. Krishi Vigyan Kendras (KVKs), ICAR Institutes, State/ Central/ Private Agricultural Universities (SAUs), Agricultural Technology Management Agency (ATMA) along with all state line departments, private companies, farmers' groups, Non-Governmental Organisations (NGOs) and input sellers are the major extension agencies in India. All these extension agencies have their strengths and weaknesses in handling the agricultural extension program. In order to have a right selection of an extension agency for a particular activity and target group, an insight into the strengths and weaknesses of these extension agencies, along with an analysis of their respective opportunities and threats, is very important. This article reviews 69 studies published between 2001 and 2022 on the strengths, weaknesses, opportunities and threats (SWOT) of different extension agencies operational in India.

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KVKs

India has a vast network of 731 KVKs across the country (ICAR 2022a). The majority are hosted by SAUs, followed by NGOs, ICAR institutes and Central Agricultural Universities for technology assessment, demonstration and capacity development. Taking into consideration their vibrancy and pro-activeness in efficiently disseminating technological inputs to the farmers, the role of agricultural extension for KVKs was gradually broadened. KVKs, as the mainstream agricultural extension, have their areas of

Table 1: Proportion of land-holdings under different farm categories over the time.

Category of farmers	Percentage of land holdings during		
	2005-06	2010-11	2015-16
Marginal	64.80	67.10	68.45
Small	18.50	17.90	17.62
Sub-total	**83.30**	**85.00**	**86.07**
Semi-Medium	10.90	10.00	9.55
Medium	4.90	4.20	3.80
Large	0.80	0.70	0.57
Total holdings (millions)	129.22	138.35	146.45

Data source: DAC and FW (2020).

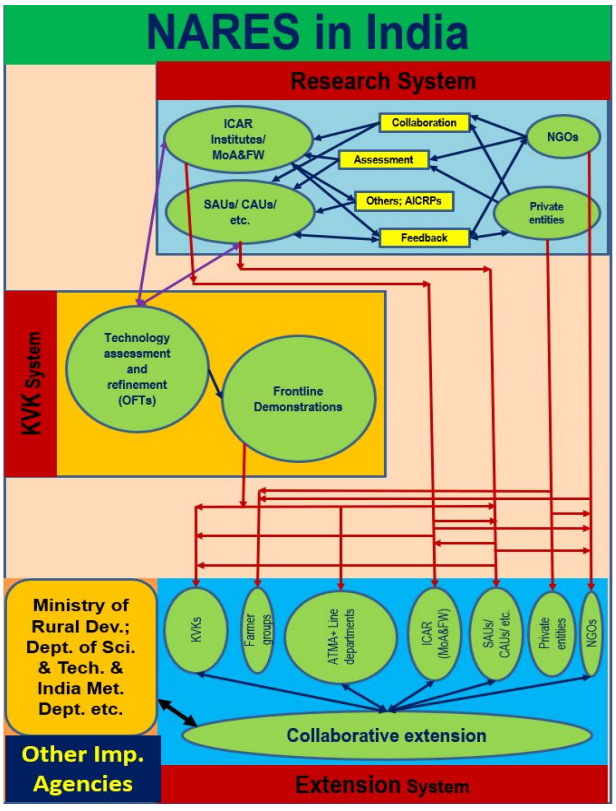

Fig 1: Functional depiction of Indian national agricultural research and extension system (NARES).

strengths and weaknesses that need to be understood thoroughly (Table 2).

Strengths

KVKs have a well-established extension program based on a long experience and rigorous monitoring and evaluation mechanism (Joshi *et al.,* 2018; Singh *et al.,* 2019d) that generates very high returns to investment for the nation (NILERD, 2015; Joshi *et al.,* 2015; Kumar *et al.,* 2019). Similarly, KVKs have a well-funded extension infrastructure for optimal functioning and outcome (Joshi *et al.,* 2018). Besides host organisations, KVKs disseminated technologies from other institutions (Mukherjee *et al.,* 2015). KVKs deal with all aspects of farming and provide holistic solutions/ technical services to the farmers. Being a public-funded extension agency, KVKs are not desperate to promote everything without looking at the interest of the farmers. It has put the private extension service and input delivery mechanism to augment their quality and provide services to the stakeholders at a competitive level. The mandates of on-farm testing and organizing frontline demonstrations, besides provisioning quality planting materials (especially seeds), have helped in the diffusion and adoption of better as well as appropriate varieties and technologies suitable for local conditions.

Weaknesses

Limited manpower in KVKs limits their ability to reach a large number of farmers (Papnai *et al.,* 2013; Singh *et al.,* 2013a). With changing global scenario, the Government of India is contemplating KVKs as a One-Stop-Shop with integrated facilities of value addition and processing, market linkages, entrepreneurship development and incubation centres for which needed manpower of specialized skills is lacking in the KVKs. Further, Papnai *et al.* (2013) also pointed out the non-availability of Subject Matter Specialists in all subjects in all KVKs, especially in fishery, animal sciences and horticulture. Increasing non-mandated activities has adversely affected the mandated activities of KVKs over the years (Kumar and Kaur, 2015). Increasing workload and less scientific recognition of the extension activities induce talented KVK scientists to shift to the research system. Rapidly increasing reporting requirements have left meagre time for the KVK staff to handle the mandated activities (Reddy *et al.,* 2018).

Table 2: SWOT analysis of KVKs as extension agency.

Strengths	Weaknesses	Opportunities	Threats
High returns to investment	Limited reach	Excellent team for a farming system approach	Low scientific recognition
Well-established extension program	Increasing non-mandated activities	Strong convergence abilities	A rapid increase in non-mandated activities
Well-funded extension infrastructure	Talent shifts to research	The best agency under abnormal circumstances	
Dissemination of Pan-India robust technologies	Time-consuming reporting	Outsourcing of services	Increasing work pressure from SAUs
Holistic/ innovative technical services	Lack of all SMSs	Network projects with additional manpower	
		Possibility of additional staff	

Opportunities

KVKs possess a multidisciplinary team for excellent technology transfer under the Farming System Approach of extension. The burning of national issues like crop residue burning has been addressed by the KVKs very efficiently (Singh *et al.,* 2018a; 2018c; 2019a; 2019b; 2019c), which provides confidence regarding their ability to handle other issues of immediate national significance. KVKs have demonstrated their strong ability to provide innovative solutions (Singh *et al.,* 2018b; Rana *et al.,* 2019b; 2019c) and execute programs of national significance such as entrepreneurship development (Shirur *et al.,* 2017; 2018; 2019), among rural youth (Rana *et al.,* 2019a) and to establish convergence with other important agencies. All major ministries having a stake in the rural areas are keen to collaborate with KVKs. Hence, the KVKs have a very strong opportunity to converge with several agencies of national significance to ensure farmers' welfare. They have also demonstrated their ability to perform during unexpected conditions like COVID-19 and similar situations can also be tackled by them in the future. Serious thinking is being given to establishing a system of outsourcing manpower and services at the KVKs to increase the quality and quantity of extension output. Recently, additional manpower has been provided to KVKs through various network projects and this trend is expected to strengthen in the future. Keeping in view the importance of KVKs, enhanced staff strength is quite likely at KVKs that will result in favourable extension output (Kokate *et al.,* 2009).

Threats

Extension activities are considered to carry a relatively low scientific impact in terms of research products and publications compared to basic/fundamental/applied research. Considering the nature and extent of extension activities, the comparative weights for such activities should be revised vis-à-vis the research activities in the promotion process otherwise, it might pose a serious threat to the long-term vibrancy of the KVK system. A rapid increase in non-mandated activities for KVKs is another threat and if it continues, the quality of output of mandated activities might be adversely affected (Sulaiman and van-den-Ban, 2003; Kumar and Kaur, 2015). Recently the host organisations have been shifting the workload of their in-house extension system to KVKs, putting the additional workload on an already loaded system.

ATMA/line departments

The Training and Visit program introduced in 1974 lost its relevance in India because of administrative, technical, operational and accountability issues (Gowda, 2012). The conception of ATMA as an arm of state Departments of Agriculture was an effort to revitalise the country's agriculture extension delivery mechanism (Gowda, 2012) and their SWOT have been thoroughly described in Table 3.

Strengths

A wider reach to farmers is an important strength of ATMA (DAC, 2010) as they run a large number of farmers' welfare schemes and have good coordination with the farming community (Swanson *et al.,* 2008; Mukherjee *et al.,* 2015; DAC, 2018). They are a strong agency for input supply, especially for small farmers (Planning Commission, 2007). The decentralization of planning and implementation creates a bottom-up extension experience at ATMA.

Weaknesses

Their tremendous time goes into general things and the quality of extension output gets compromised (Reddy *et al.,* 2006). Dependence on inadequately trained temporary manpower and lack of specialists for highly technical enterprises force farmers to approach other extension agencies (Sulaiman and Hall, 2008). Isolated working of the line departments is another weakness of this extension agency (Sulaiman and Hall, 2008). The enhanced political interference and sub-optimal participation from chairpersons (DCs) weaken this extension agency.

Opportunities

Being headed by the highest administrator in the district is an opportunity to implement district agriculture plans better. Increased options for outsourcing manpower/services can spare their time for mandated activities (Swanson *et al.,* 2008). The application of IT tools will also enhance their efficiency and output. Higher professionalism among farmers will replace supply-push-extension with demand-pull-extension, improving the quality of their service. ATMA is a strong platform for collaborations with various other extension agencies.

Threats

High quality of extension services by private/ other extension agencies may make ATMA's presence insignificant. Rapid

Table 3: SWOT analysis of ATMA/ line departments as extension agency.

Strengths	Weaknesses	Opportunities	Threats
Wider reach	Little time for extension	Chaired by DC	Better extension by others
Several welfare-schemes	Lack specialized extension-agents	Outsourcing services	Exhaustive reporting
Strong input-supply agency	Political interference	IT applications	Enhanced political interference
Farmers' large network	Isolated working of line departments	Replacement of supply-push extension	Precedence to routine-acts
Great feedback mechanism	Missing participation of DCs	A platform for collaborative programs	Sub-optimal implementation
	Dependence on temporary manpower		

enhancement in reporting/ record-keeping might further reduce their core extension output (Raabe, 2008). Enhanced political interference in ATMA's implementation might prove detrimental. Sub-optimal implementation and engrossment in routine activities might make them unimportant extension agencies (Singh, 2008).

SAUs

India started establishing state agricultural universities (SAUs) as early as 1960 with the inception of G.B. Pant University of Agriculture and Technology, Pantnagar (GBPUAT, 2022). India has sixty-three SAUs for generating location-specific agri-technologies and facilitating their dissemination among farmers (ICAR, 2022b). SAUs as an extension agency have their own SWOT (Table 4).

Strengths

Specialized departments and sections help the scientists acquire in-depth knowledge to generate and disseminate suitable technologies to the farmers. SAUs have used Kisan Melas very efficiently for showcasing and transferring such technologies (Singh *et al.,* 2013b). The SAUs have been seen as an important inputs-supply agency for specialized inputs (Pardey and Roseboorn, 1989).

Weaknesses

Biased promotion of SAUs's technologies might omit better technologies to the farmers' disadvantage. Strongly popularized latest varieties through mass/ social media are not supported by the adequate seed supply to meet farmers' demand in Kisan Melas, creating awkward situations (Ramaswamy and Selvraj, 2007). Generally, the scientists responsible for technology generation have limited insight into the ground realities (Reddy *et al.,* 2006). In SAUs, non-extensionists/social scientists acting as extension managers generally compromise the essence of the extension philosophy.

Opportunities

SAUs are developing two-way communication IT platforms to reach all farmers more efficiently and effectively (Planning Commission, 2007). However, the Common-Service-Centres in the Gram Panchayats already offer two-way communication through technical backup from KVKs, which SAUs might also use to improve their extension efficiency. Higher Public-Private-Partnership in agricultural extension is another strong opportunity for SAUs to effectively disseminate technologies of the private partners (Singh *et al.,* 2013a).

Threats

Score-cards used for promotion assessment having inadequate weightage for extension activities is demotivating extension scientists (Ramaswamy and Selvraj, 2007). Many SAUs have weakened their in-house extension system with excessive dependence on the KVK system. Any policy change on the administrative structure of KVKs could be a terrible development for SAUs. The emergence of specialized universities is hampering systems approach to extension and creating gaps in the process (Tamboli and Nene, 2011).

ICAR institutes

India has a large number of Research Institutes (102) and Agricultural Technology Application Research Institutes (11) in the country (ICAR, 2022c). The country-wide network of ICAR institutes was created to generate technologies for various crops and geographies, however, they had to strengthen the in-house technology dissemination system as other agencies could not transfer technologies generated by these institutes. The SWOT of ICAR institutes as an extension has been presented in Table 5.

Strengths

ICAR institutes are working on specialized commodities/ components; hence, their technical inputs are also highly precise. Close coordination in technology generation and technology dissemination teams ensures high-quality dissemination/ adoption. ICAR institutes are at an advantage in assimilating extension experiences from other states (Dash and Mishra, 2004). ICAR institutes act as excellent trainers of master-trainers for state departments.

Weaknesses

Except few institutes, they provide crop/commodity-specific answers and farmers must depend on other agencies for complete solutions (Sulaiman and van-den-Ban, 2003). The ICAR institutes have limited reach among farmers and extension agents/ personnel might face language problems resulting in inefficient extension efforts (Sulaiman and Hall, 2004). Sometimes the strongly popularised technologies, especially the varieties, are not backed-up with an adequate supply of quality seed resulting in inadequate adoption.

Table 4: SWOT analysis of SAUs as extension agency.

Strengths	Weaknesses	Opportunities	Threats
Knowledgeable staff	Might promote only own technologies	Two-way communication platforms	Promotion score-cards
Specialists of different aspects	Popularizing technologies without supply management	Better public-private-partnership	Deteriorated extension-system
Generators of technologies			Specialized universities lack a system approach
Efficiently used Kisan melas	Non-extensionist extension managers	Common-service-centres	
Inputs supply-agency for pecialized inputs	Lack of insight into field realities		

Existing score-cards for the promotion of ICAR scientists give inadequate significance to the extension activities resulting in demotivation of extensionists. Lab scientists generally have limited insight into the farmers' field realities (Reddy *et al.,* 2006).

Opportunities

Outsourcing services/ staff will help these institutes improve the management of their extension services (Dash and Mishra, 2004). Their technology generation strength will easily get collaboration from various extension agencies to better disseminate technologies (Sulaiman and Hall, 2004). Enhanced Public-Private-Partnership in future agricultural extension will be an opportunity for these institutes to generate funds by effectively disseminating technology from private research agencies (Singh *et al.,* 2013a).

Threats

Highly specialized ICAR research institutes may not have a sustainable rapport with farmers. The fast-depleting Technical Staff and the fast-increasing research activities might deteriorate the quality of extension services by ICAR institutes (Sulaiman and van-den-Ban, 2003).

Corporates

With its interest in selling a range of agri-inputs in India, the corporate sector has also contributed to the technology transfer process with its innovative methods and ICT applications. Though such efforts are sporadic in their spread, the private extension has a tremendous role to play in the future with their unique SWOTs (Table 6).

Strengths

Corporates earmark resources to achieve desired extension output among targeted farmers (Swanson, 2009). The corporates are known for pushing extension mechanisms, especially under contract farming (Singh *et al.* 2011; Pandit *et al.* 2015) and guided by the profit motive, the companies take care of almost every need of the targeted farmer (Sulaiman, 2003).

Weaknesses

The extension program of corporates is driven by the profit motive for selected crops, varieties and groups of farmers (Sulaiman and van-den-Ban, 2003). Due to vested interests, their personnel occasionally misguide farmers on the true potential of technologies of their competitors. Poor-quality companies recruit ill-trained manpower who mis-sell and over-recommend their products making false claims which inflict losses to the unsuspecting farmers (Dalwai, 2018).

Opportunities

With the rapid adoption of specialized agri-enterprises by farmers, the scope of extension by corporates will also increase (Sulaiman and Hall, 2004). The recently enacted Farm Acts will increase the scope of private extension and the reliable and good-quality private players with high credibility will seize the opportunity aptly.

Threats

With the power of social media in extension services, companies with poor standards pose a threat of enhanced misinformation and online/ offline financial frauds/cheatings if an effective regulatory protective mechanism remains absent (Dalwai, 2018).

Table 5: SWOT analysis of ICAR institutes as extension agency.

Strengths	Weaknesses	Opportunities	Threats
High-quality technical input	Lack comprehensive solutions Limited reach	Outsourcing services	Un-sustainable field rapport
Efficient technology dissemination teams	Personnel's language-problem Inadequate supply of seed material	Easy collaboration	Depleting Technical Staff
Others' experiences	Inadequate significance in ASRB score-card	Higher PPP	
Strong trainer of master-trainers	Scientists lack insight into farmers' realities		

Table 6: SWOT analysis of corporates as an extension agency.

Strengths	Weaknesses	Opportunities	Threats
Earmarked resources Ensuring specialized inputs' availability Comprehensive technical know-how Consider farmers' all needs	Target selected farmers Driven by profit-motive Occasionally misguide farmers Mis-selling by poor-quality companies Over recommended/ additional products	Scope will increase Enhance role under New-Farm-Acts Increasing Farmers' faith	Poor-quality companies might exploit social media for fraud Enhanced misinformation Absence of effective regulator

NGOs

Non-Governmental Organisations (NGOs) as an extension agencies are quite prominent in other parts of the world (Bruntrup-Seidemann, 2011; Afrad *et al.,* 2019). However, NGOs have limited areas of operation in India and they do have their specific SWOTs (Table 7).

Strengths

Motivated NGOs are passionate about changing farmers' lives as they focus on providing practical solutions and specialized inputs at the farmers' doorsteps at reasonable prices (Wahab *et al.,* 2011). Some NGOs refine and modify low-cost technologies based on the indigenous-technical knowledge, especially in locations having severe challenges and disadvantages (Glendenning *et al.,* 2010; Kumar *et al.,* 2022).

Weaknesses

Large number of NGOs are interested only in garnering funds without corresponding delivery. Mostly the NGOs have financial and manpower constraints, so they cannot provide comprehensive solutions to the farmers (Kumar *et al.,* 2022). They generally have a limited reach.

Opportunities

Policy action channelizing Corporate-Social-Responsibility funds for the agriculture sector will create opportunities for NGOs in agricultural extension too. Moreover, NGOs focus on agriculture as an integral part of the overall environment/ health where funds flow might enhance. A higher extent of Public-Private-Partnership might create a strong opportunity for NGOs in future agricultural extension (Singh *et al.,* 2013a).

Threats

The mushrooming growth of non-performing NGOs threatens them as an important extension agency. The NGOs focusing on traditional agricultural practices strongly oppose the current scientific practices and they are likely to be used by the political parties in opposition to the government for political reasons (Chirwa *et al.,* 2005). Some NGOs might resort to activism and imparting unrest among farmers due to the compulsive nature or vested interests of the persons running such NGOs.

FBOs/FPOs

The government of India has recently laid very strong emphasis on establishing Farmers-Based-Organizations (FBOs) in general and Farmer-Producer-Organizations (FPOs) in particular to uplift farmers' socio-economics (Singh *et al.,* 2022a). National Bank for Agriculture and Rural Development (NABARD), the leading agency in establishing FPOs in India, claims the establishment of more than 6000 FPOs, including the producer companies, in the past ten years and 10000 new FPOs are being established in the future with the major responsibility on the shoulders of NABARD and Small Farmers Agribusiness Consortium (SFAC) (TCI, 2022). The abstract of the SWOT of the FBOs/ FPOs as an extension agency is presented in Table 8.

Strengths

They accurately identify needs/ solutions for their members as they belong to a closely interactive group (Trebbin and Markus, 2012). They have very well-defined objectives with a clear focus (Van Herck, 2014). The government is

Table 7: SWOT analysis of NGOs as extension agency.

Strengths	Weaknesses	Opportunities	Threats
Mission-mode working	Mostly focus on garnering funds	CSR funds mobilization	Mushrooming growth
Problems' excellent understanding	Financial/ manpower constraints	Agriculture is an important part of the environment/health	Traditional mindsets are opposing scientific practices
Inputs at farmers' doorsteps	Highly specific reach		It might be politically used
Refine/modify low-cost ITKs	Target only some components	Higher PPP	Activist NGOs might promote farmers' agitation

Table 8: SWOT analysis of FBOs/ FPOs as extension agency.

Strengths	Weaknesses	Opportunities	Threats
Accurately identify problems/ solutions	Dominant member(s) dis-empower others	Preferred flexible agency for collaboration	Failure in competitive marketing
Defined objectives; well-focussed		Expected widened/	
10000 by 2023-24	Opportunistic	sharpened role	Rapidly vanishing
Handle proficiency demanding complicated activities	leadership	Government's higher emphasis on food-processing	cooperative culture
Best farmer-to-farmer extension platform	Limited technical know-how	State-of-the-art e-commerce platform	Lacking business skills

Table 9: SWOT analysis of Input dealers as extension agency.

Strengths	Weaknesses	Opportunities	Threats
Farmers' close contact	Technically less-competent	Large number	Lacking GAP
	Might misguide farmers	Present in remote areas	implementation
	Generally, over-recommend	Efficient technology-transfer	guidelines
Convenient option	high-margins inputs	Capacity-building under DAESI	Absence of an
	Input overuse inflicts losses	-MANAGE	efficient
	to farmers/ecology	GAP awareness will upgrade them	regulator

contemplating the creation of 10000 FPOs in the country by 2023-24 (MoA and FW, 2020). They have an adequate number of experienced members in order to handle complicated and proficiency demanding activities (Salifu *et al.* 2010). They provide the best platform for income enhancement of the farmers and the farmer-to-farmer extension (Van Herck, 2014; Singh *et al.,* 2022b).

Weaknesses

Dominant member(s) in FBOs/ FPOs take control of decision-making and financial affairs disempowering other members (Chirwa *et al.,* 2005; Singh *et al.,* 2022c). Acts of selfish/ dishonest leadership demotivate other members, seriously compromising the vibrancy of the group (Carney, 1994). The group members lack the technical know-how for all aspects of specialized farming activities.

Opportunities

FBOs/ FPOs are the first choice of major extension agencies for collaborative programs due to their flexibility (Birner and Anderson, 2007). The government of India has a higher focus on agricultural/rural development for enhancing farmers' income through various programs where these groups can play a decisive role (Birner and Anderson, 2007). These groups being very strong in food processing/ value addition, are expected to be specialized sources of technical dissemination (World Bank, 2008). The government's facilitation to provide a state-of-the-art e-commerce platform for direct marketing of products manufactured by these groups may prove to be a strong boost for the sustainability and growth of these groups (Hazell *et al.,* 2010; Rana *et al.,* 2022).

Threats

Inability to find a proper market might restrict these groups from upscaling or continuing their businesses (Barrett, 2008). The rapidly vanishing cooperative culture among people and lack of business skills among the majority of the farmers might pose serious threats for them as innovative marketing is essential here (Markelova *et al.,* 2009).

Agricultural inputs sellers

There are 2.82 lakh agricultural input dealers in India who are one of the most important agencies providing technical information on farming to the farmers (DAC, 2014). The input sellers/dealers also constitute an important extension agency in India, having their own SWOT (Table 9).

Strengths

The proximity of agricultural inputs sellers/dealers to farmers and the very strong inter-dependence between them creates a huge potential for extension through this agency, which has not been adequately documented and appreciated (Reddy *et al.,* 2019).

Weaknesses

The extension delivery by this agency is generally based on technically less competent and ill-trained persons who don't understand the nuances and scientific basis of agriculture (Singh *et al.,* 2016). They are likely to give wrong advice and recommend high-margin and unnecessary inputs leading to serious overuse of pesticides and fertilisers, resulting in economic losses to farmers and seriously damaging the environment and ecology (Bhushan *et al.,* 2013).

Opportunities

Large number of inputs-sellers as extension agents are present even in the remotest parts and constitute a potent resource for technology transfer (Reddy *et al.,* 2019). The diploma program in Agricultural Extension Services for Input Dealers (DAESI) by MANAGE aims at capacity building (Kumar *et al.,* 2020). Adoption of good agriculture practices will make input sellers/ dealers change too.

Threats

The failure to design guidelines and to implement good practices for the input sellers by the regulator might lead to higher exploitation of farmers by mis-selling/ overselling in the future (DAC, 2014).

CONCLUSION

Multiple extension agencies are working in India to provide extension services on a highly diverse set of agricultural activities and crop enterprises to a large number of small and poor farmers. All these agencies have their respective strong and weak points along with future potentials and vulnerabilities when implementing extension programs in the field. Some agencies like ATMA and the state line departments can reach the entire farming community in the country but face difficulties in handling highly specific technical expertise on speciality enterprises. Similarly, SAUs and ICAR institutes have a high-quality technical knowledge base but do not have the needed network to reach all the

farmers in the country. KVKs are known for providing extension services on all aspects of farming, but they have limited staff to reach only a small portion of the farming population. Corporates offer extension services to the farmers but have a highly focused approach and don't attend to the non-focused farmers. Likewise, NGOs have a strong advantage of grassroots presence and also assessing the problems and needs of the targeted farming community, but their resources allow them only to reach a very small proportion of the farmers. FBOs and FPOs are very strong in farmer-to-farmer extension with highly precise solutions to the well-understood problems of their closely interactive group members. However, they are generally restricted to the group members and have to seek the assistance of other extension agencies to get solutions on all aspects of farming. All these agencies do have their respective future opportunities and potential threats. An in-depth understanding of the SWOT of all these extension agencies is imperative for designing flawless extension programs for the brighter future of agriculture in India. The article can significantly improve extension management in the future.

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Conflict of interest

On behalf of all the authors I confirm and state that the authors have no conflict of interest.

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