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University-Industry Collaboration in Dairy and Poultry Sectors of Andhra Pradesh: Status of Stakeholders' Participation

P. Mahesh[1], B. Subrahmanyeswari[2] and A.P. Patil[3]

ABSTRACT

This study examines the extent and purpose of university researchers and industry personnel participation in University Research-Industry (UR-I) linkages within the dairy, poultry, and pharmaceutical sectors of Andhra Pradesh. Sri Venkateswara Veterinary University (SVVU), Tirupati, Andhra Pradesh, India was selected as the technology-generating unit, and three sectors - dairy, poultry, and pharmaceuticals - were chosen as technology-utilizing units. Data were collected from 60 university researchers and 40 industry personnel using semi-structured interviews, coded, and analysed for percentage and frequency. Findings indicate that most university researchers (51.67%) and industry personnel (45.00%) exhibit low participation in UR-I activities, primarily due to a focus on small-scale farming and lack of awareness about university capabilities, respectively. Key activities such as trainings, research sponsorships, and joint funding were underutilized, with telephone calls and personal visits being more common. The study underscores the need for universities and industries to enhance collaboration for mutual benefits and the advancement of the livestock sector. Effective communication, regular meetings, and leveraging each other's expertise are crucial for fostering innovation and competitiveness.

Keywords: *Innovation; Livestock Sector; Participation; Research Linkages; Technology Transfer; University-Industry Collaboration; Andhra Pradesh*

INTRODUCTION

Effective linkages between research and industry are crucial for driving technological innovation and enhancing global competitiveness. Research-Industry (R-I) linkages create an environment conducive to technological advancements by connecting academia and industry (Perkmann et al., 2013a; D'Este & Patel, 2007). University-Industry Research Cooperation (UIRC) is essential for national competitiveness (Ankrah and AL-Tabbaa, 2015). The participation of university researchers and industry personnel in UR-I linkages significantly impacts innovation outcomes. Various forms of

[1]Veterinary Dispensary Pattempalem, Tadepalligudem Mandal, West Godavari Dist.- 534101, Andhra Pradesh.

[2]Department of Veterinary & AH Extension Education, NTR College of Veterinary Science, Gannavaram, Krishna (Dt), 521 102, Andhra Pradesh.

[3]Department of Veterinary & AH Extension Education, College of Veterinary & Animal Sciences, Parbhani, Maharashtra Animal & Fishery Sciences University, Nagpur, Maharashtra.

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interaction, including joint research, contract research, and scientific consulting, have been identified as crucial for successful collaborations (Aschhoff and Sofka, 2009; Vega-Jurado et al., 2008).

Indirect methods such as technology incubation centers and parks, along with traditional linkage forms like student placements and staff exchanges, also play a vital role in fostering innovation (Ouma etal., 2010; Mpehongwa, 2013). The Farmer-Industry-Research-Extension (FIRE) model highlights the importance of effective communication and feedback loops for modernizing livestock sectors (García Martínez et al., 2014). Digital platforms and networks are increasingly facilitating real-time collaboration and knowledge exchange between academia and industry, enhancing the effectiveness of UR-I linkages (Etzkowitz & Zhou, 2017; Rajalo and Vadi, 2022). In India, the Indian Council of Agricultural Research (ICAR) has promoted university-industry (UR-I) linkages through various initiatives, like implementing projects like the National Agricultural Higher Education Project (NAHEP) to improve agricultural higher education by fostering collaborations between academia and industry. This has involved organizing national-level workshops with participation from both sectors to strengthen these linkages. Such initiatives aim to enhance the quality of education, improve employability and entrepreneurial skills among students, and support the agricultural industry with innovative technologies (Rao and Agrawal, 2023).

This study aims to inventory the activities through which university researchers and industry personnel interact in the dairy and poultry sectors of Andhra Pradesh. It focuses on the extent and purpose of their participation in UR-I linkages, with the hypothesis that enhanced collaboration strategies will drive innovation and competitiveness. It also explores UR-I interactions in Andhra Pradesh's dairy and poultry sectors, aiming to enhance collaboration strategies that benefit universities, industry, and clientele through innovation and competitiveness. It also fills the gap in evaluating stakeholder participation and its role in driving innovation.

METHODOLOGY

Sri Venkateswara Veterinary University (SVVU), Tirupati in Andhra Pradesh, India was selected purposively as the technology-generating unit, while three main sectors from the livestock industry - dairy, poultry, and pharmaceuticals; from the same state were selected as the technology-utilizing units. A convenience sampling procedure was followed to select 60 scientific staff i.e., 55 from academic institutions and five from research stations of Sri Venkateswara Veterinary University, Andhra Pradesh. Altogether, forty (40) industry personnel from the three industrial sectors existing in Andhra Pradesh i.e., 15 from dairy industry, 10 from poultry industry and 15 from veterinary pharmaceuticals who were involved in research relevant/technology utilization activities like production, processing, value addition, care and management, breeding, regulatory affairs and quality control and assurance affairs were selected through purposive sampling. Responses were collected using semi-structured schedules constructed for this purpose. The data collected were coded, tabulated, and analyzed based on percentage and frequency to find the purpose of participation of partners in UR-I linkage activities.

FINDINGS AND DISCUSSION

On analysing the data, it was revealed that three fourths (76.70%) of the university researchers were male, with nearly half belonging to the Professor/Principal Scientist

category. Nearly half of the researchers (48.33%) were in the middle age group and about one-third (33.33%) of the scientists had 13-22 years of job experience, and 31.67 per cent had 3-12 years of job experience. More than three-fourths (80%) of the researchers handled four or lesser projects, and the majority (63.33%) received 1-4 trainings. Nearly three-fourths of the researchers had medium levels of job satisfaction and motivation. More than half of the researchers had medium role clarity and approximately two-third (68.33%) felt they were working in a medium level of organizational climate and had medium knowledge in communication methods. Almost all the researchers had medium achievement motivation.

Most (90%) of the industry personnel were male, with more than half (57.50%) being post-graduates. A majority (60%) were in the age group of 29-44 years, and nearly half had less than 15 years of job experience. About 60 per cent of respondents received 1-5 trainings. Majority (60%) of industry personnel had medium job satisfaction, and more than three-fourths (85%) with medium levels of job motivation. Nearly two-thirds (60.00%) were with medium role clarity and felt they were working under a medium organizational climate. Most (60%) expressed medium levels of achievement motivation. Findings revealed that more than half (51.67%) of the researchers had a low extent of participation in UR-I linkage activities.

Table 1: Extent of Participation of Respondents in (UR-I) Linkage

Sl.No.	Category	Researchers (n=60)		Industry personnel (n=40)	
		F	%	F	%
1	Low	31	51.67	18	45.00
2	Medium	18	30.00	16	40.00
3	High	11	18.33	06	15.00
4	Total	60	100.00	40	100.00

In the case of industry personnel, 45 per cent had a low extent of participation in UR-I linkage activities, possibly due to lack of awareness about the university's expertise and capabilities. Additionally, the industry might own advanced equipment and research techniques compared to the universities. However, livestock industries should focus on strengthening linkages with universities to leverage human expertise for quality livestock production (Zawdie, 2010). The high adoption levels were observed for most scientific dairy practices with support from multiple veterinary institutions as per the research study by Thakur et al., (2023) an indication of the need of strengthening of linkages between different veterinary institutions working for the betterment of livestock production.

Analysis of researchers based on their extent of participation in various UR-I linkage activities (Table 1) revealed that most linkage activities were occasionally used by around 50 per cent of university researchers, indicating an interest in exploring new research areas and alternative funding avenues. However, activities like trainings, research sponsorships, joint funding, research-industry newsletters, and research publication exchange programmes were never utilized by more than three-fourth of the researchers, possibly due to lack of time and interest. Some researchers felt that research linkage with the industry could be risky, leading to minimal participation.

Table 2: Analysis of Partners Based on Their Extent of Participation in Various UR-I Linkage Activities

Sl. No.	Activity	Researchers			Industry Personnel		
		Regular (%)	Occasional (%)	Never (%)	Regular (%)	Occasional (%)	Never (%)
1	Personal Visits	08.33	43.33	48.34	02.50	37.50	60.00
2	Official meetings	11.67	40.00	48.33	00.00	45.00	55.00
3	Telephone calls	23.33	53.33	23.34	05.00	62.50	32.50
4	Trainings	03.33	23.33	73.34	00.00	20.00	80.00
5	Workshops	05.00	51.67	43.33	00.00	62.50	37.50
6	Seminars	03.33	60.00	36.67	00.00	50.00	50.00
7	Research Publications exchange/joint publications (national and international)	01.67	18.33	80.00	00.00	12.50	87.50
8	Sponsorships	01.67	06.67	91.66	00.00	12.50	87.50
9	Joint funding activities	01.67	03.33	95.00	00.00	07.50	92.50
10	Results verification Trials	01.67	31.67	66.66	00.00	27.50	72.50
11	R-I news letter	01.67	20.00	78.33	00.00	15.00	85.00
12	Livestock and their products Exhibitions	03.33	51.67	45.00	00.00	52.50	47.50

Linkage activities such as trainings, seminars, research publication exchange programmes, sponsorships, joint funding activities, result verification trials, R-I newsletters, and livestock & product exhibitions were regularly used by less than 5 per cent of university researchers (Table 2). In contrast, personal visits, official meetings, and telephone calls were regularly used by 8.33, 11.67, and 23.33 per cent of researchers, respectively. This positive response indicates a favourable attitude towards participating in UR-I linkages (Vega-Jurado et al., 2008).

The linkage activity 'telephone calls' has been utilized regularly by 23.33 per cent of researchers, indicating that the university could act as a consultant for enriching the industry's subject matter. It is recommended that the university intensify the commercialization of its research findings and establish linkages with

industries as research partners, apart from providing consultancy services. Official meetings saw regular participation from only 11.67 per cent of university researchers, suggesting the need for frequent official meetings to enhance mutual benefits. Only 8.33 per cent could regularly visit industries personally, possibly due to personal interest in focusing on industry needs and tapping research potentialities. More formalized personal visits could motivate researchers to obtain firsthand information about technology utilization and associated problems.

Analysis of industry personnel based on their extent of participation in various UR-I linkage activities revealed that most linkage activities were never utilized by more than half of the industry personnel, possibly due to lack of awareness of R-I linkages and their benefits. Some linkage activities, such as telephone calls, workshops, seminars, and livestock product exhibitions, were occasionally used by about 50 per cent of industry personnel. Regular use of telephone calls and personal visits as linkage activities were found among very few (5% and 2.50%) industry personnel, indicating some industries view the university as a consultant for quality and improved production standards. To achieve sustained and efficient linkages between industry and university, developing strong linkages is essential (Meyer-Krahmer and Schmoch, 1998).

Table 3: Purpose of Participation of Partners in UR-I Linkage Activities

Purpose	Researchers				Industry Personnel				Rank
	Yes		No		Yes		No		
	F	%	F	%	F	%	F	%	
Introduce and disseminate innovations	35	58.33	25	41.67	20	50.00	20	50.00	II
Discussions	40	66.67	20	33.33	24	60.00	16	40.00	I
Feedback	30	50.00	30	50.00	15	37.50	25	62.50	III

As regard to the purpose of participation of partners in UR-I linkage activities, findings from Table 3 revealed that university researchers participated in various UR-I linkage activities mainly to discuss industry problems and needs, arriving at possible research ideas, and introducing innovations to the commercial sector. About 50 per cent of researchers were interested in receiving feedback from technology users, aiding in refining and reinventing technologies to meet end-user needs. All researchers should be encouraged to participate in as many discussion forums as possible for effective technology utilization. Industry personnel responded similarly, indicating they utilize the university more as a consulting body than a research partner for enhancing production quality (Perkmann et al., 2013b).

CONCLUSION

The study concludes that both university researchers and industry personnel in Andhra Pradesh's dairy, poultry, and pharmaceutical sectors exhibit low participation in University-Industry Research (UR-I) linkages, driven by limited awareness of participatory capabilities and a focus on small-scale farming. Discussions

to address industry needs rank highest as the purpose of participation, followed by introducing innovations and exchanging feedback. However, critical activities like joint funding, research sponsorships, and publication exchanges are rarely utilized, with telephone calls and personal visits dominating interactions. To enhance innovation and competitiveness, SVVU and livestock industries should prioritize structured communication, regular official engagements, and leverage university expertise beyond consultancy, fostering a robust research partnership tailored to the region's livestock potential.

REFERENCES

Ankrah, S., & AL-Tabbaa, O. (2015). Universities–industry collaboration: A systematic review. *Scandinavian Journal of Management*, *31*(3),387-408. https://doi.org/10.1016/j.scaman.2015.02.003

Aschhoff, B., & Sofka, W. (2009). Innovation on demand - Can public procurement drive market success of innovations? *Research Policy*, *38*(8),1235-1247. https://doi.org/10.1016/j.respol.2009.06.011

D'Este, P., & Patel, P. (2007). University–industry linkages in the UK: What are the factors underlying the variety of interactions with industry? *Research Policy*, *36*(9),1295-1313. https://doi.org/10.1016/j.respol.2007.05.002

Etzkowitz, H., & Zhou, C. (2017). *The Triple Helix: University-Industry-Government Innovation and Entrepreneurship* (2nd ed.). Routledge. https://doi.org/10.4324/9781315620183

García Martinez, M., Zouaghi, F., & Sanchez Garcia, M. (2017). Capturing value from alliance portfolio diversity: The mediating role of R&D human capital in high- and low-tech industries. *Technovation*, *59*, 55-67. https://doi.org/10.1016/j.technovation.2016.06.003

Meyer-Krahmer, F., & Schmoch, U. (1998). Science-based technologies: University-industry interactions in four fields. *Research Policy*, *27*(8), 835-851. https://doi.org/10.1016/S0048-7333(98)00094-8

Mpehongwa, G. (2013). Academia-industry-government linkages in Tanzania: Trends, challenges and prospects. *Global Journal of Education Research*, *1*(1), 84-91. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=79813d7ca81e968ce4dc34c6de2ea9ff64cfd67c

Ouma, E., Jagwe, J., Obare, G. A., & Abele, S. (2010). Determinants of smallholder farmers' participation in banana markets in Central Africa: The role of transaction costs. *Agricultural Economics*, *41*(2), 111-122. https://doi.org/10.1111/j.1574-0862.2009.00429.x

Perkmann, M., Neely, A., & Walsh, K. (2013). How should firms evaluate success in university–industry alliances? *Research Policy*, *40*(6), 624-637.

Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Broström, A., D'Este, P., & Sobrero, M. (2013). Academic engagement and commercialisation: A review of the literature on university–industry relations. Research Policy, *42*(2), 423-442. https://doi.org/10.1016/j.respol.2012.09.007

Rajalo, S., & Vadi, M. (2017). University-industry innovation collaboration: Reconceptualization. *Technovation*, *62-63*, 42-54. https://doi.org/10.1016/j.technovation.2017.04.003

Rao, C. S., & Agrawal, R. C. (2023). Academia-industry linkages for sustainable innovation in agriculture higher education in India. *Sustainability*, *15*(23), 16450. https://doi.org/10.3390/su152316450

Thakur, D., Ahuja, R., Sharma, M., Sambyal, M. S., Dinesh, K., & Khurana, S. K. (2024). Impact of Veterinary Institutional Access on the Adoption of Scientific Feeding Practices among Women Dairy Farmers in Himachal Pradesh, *Indian Journal of Veterinary Sciences and Biotechnology*, *20*(1), 83-86. https://www.researchgate.net/profile/Devesh-Thakur/publication/377439899

Vega-Jurado, J., Fernández-de-Lucio, I., & Huanca, R. (2007). University–industry relations in Bolivia: Implications for university transformations in Latin America. *Higher Education*, *56*, 205-220. https://doi.org/10.1007/s10734-007-9098-9.

Zawdie, G. (2010). Knowledge exchange and the third mission of universities: The implications for international academic collaboration. *Technology Analysis & Strategic Management*, *22*(8), 893-896. https://doi.org/10.1080/09537325.2010.511144