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Prioritization of Stakeholders in Diffusion of CAU-R Series Varieties in Manipur

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ABSTRACT

This study was conducted in order to understand the importance of the identified stakeholders in terms of power and interest in the diffusion of CAU-R series high yielding varieties of Rice among the farmers of Manipur. Three valley districts namely Imphal East, Thoubal and Bishnupur were purposively selected for the study and 85 stakeholders were identified and prioritised according to “degree of power to” and “degree of interest on” in the successful dissemination of improved technology among the farming fraternity. The results of the study witnessed that the Central Agricultural University, Imphal, the Department of Agriculture, Manipur and the Ministry of Agriculture and Farmers Welfare had high power and high interest in all the three districts along with Krishi Vigyan Kendra Imphal East, Krishi Vigyan Kendra Thoubal and the Regional Rice Research Station in Imphal East and Thoubal districts respectively. The farmers and the Farmer collectives were identified with high interest and low power while the Indian Council of Agricultural Research, Regional Centre, Manipur and Krishi Vigyan Kendra, Imphal West remained with neutral power and interest in all the three districts. The Media comprising mainly of the All India Radio, Doordarshan Television and the local newspaper Sangai express has very low interest as well as power in all the three districts. Through these observations we conclude that stakeholders like farmers and farmer cooperatives who are the actual intenders of the technology with considerable level of interest should be involved into the system for effective planning, decision-making and successful functioning of the innovation system.

Highlights

- ① The public organizations dominated the stakeholder typology and the CAU had the ultimate power of decision-making and resource allocation.
- ② The CAU, SDA, MoA&F, KVK-A, KVK-TH & RRS had high interest and power while the farmers and their collectives had high interest and low power.

Keywords: Stakeholder, Diffusion, Improved Technology, Rice, Manipur

The process of diffusion and adoption of any new technology requires the collaborative effort of multiple stakeholders (Badibanga *et al.* 2013). A stakeholder is any individual with a blatant or credible interest or stake in a policy issue. Stakeholders may assume any form, size and capacity (ODA, 1995). They can be individuals, organizations, or unorganized groups. Stakeholder

Analysis (SA) is an approach to expedite institutional and policy transformation processes by being responsible for and regularly integrating the needs of those who have a ‘stake’ or an interest in the reforms under consideration (MacArthur, 1997). According to Dentoni and Peterson (2011), multi-stakeholder engagement in agri-food supply chain has become very essential to make agricultural

research globally competitive power by 2020. Considerable higher percent of the smallholder farmers in developing countries are threatened with challenges diverse in nature and to overcome them an integrated approach of multi-stakeholder involvement responsive to the farming needs is required (Martey *et al.* 2014).

Rice is the major important cereal cultivated in India since ages. It is assumed that the foothills of Eastern Himalayas i.e. North-Eastern Region (NER) of India were the place where first the indica variety of rice was domesticated. India has about 705 varieties of Rice cultivated (Thongbam *et al.* 2010). The NER comprises 7.9 per cent area under cultivation of the country and 6.23 per cent of total production (Annual Report, MoA&F, GoI, 2017).

Rice cultivation in Manipur, which is one of the most fertile sub-tropical rain-fed farming zones of Asia, is as old as 6,000 years. Geographically, the state is gifted with enormous natural resources and rice germplasm (Medhabati *et al.* 2013). However, only 7.41 per cent of the total geographical area of the state is used for cultivation of which 52.00 per cent is limited to the valley. 67per cent of the total population of the state resides in half of the total valley region and is engaged for agriculture activities. In order to feed this percent of populace there is a high pressure on land in the valley (GoM, 2015). Population has increased by 12.05 per cent during 2001-2011, whereas the state has registered negative annual growth (-0.48 per cent) in the case of area under rice during 2000-01 to 2011-12 (Singh *et al.* 2016). There is no scope of increasing the area under valley districts and therefore it is essential to increase the production of rice to feed the rapidly growing population. Introduction and adoption of High Yielding Varieties (HYVs) which are suitable to the prevailing agro-ecological situation of the region is one of the solutions to this problem.

The Central Agricultural University, Imphal has developed a series of CAU High yielding Rice varieties under the name CAU-R varieties viz., CAU-R1 (Tamphaphou), CAU-R2 (Maniphou), CAU-R3 (Mangalphou) and CAU-R4 (Eenotphou). The CAU-R1 is a cross between Leimaphou and BR1. It is a short duration crop of 125-130 days duration adapted to rainfed wetland fields of Manipur valley. The variety is known for its high yield of 5-6 tons/ha compared to other high yielding

varieties of rice and resistant to blast bacterial leaf blight and rice gall midge. The variety was released in 1999 and notified in 2009 and is a promising variety to boost the production and productivity of rice in Manipur. The highest yield of CAU-R1 was recorded as 8.8t/ha during *kharif* 2009 and 12.3t/ha during *kharif* 2014-15 by farmers who secured awards during crop competitions conducted by the Department of Agriculture, Government of Manipur (CAU Farm Magazine, Vol 7, No.4). The variety has been disseminated to the farmers of North Eastern States specifically Manipur for testing their acceptance and adoption and was reported that significantly large number of farmers in the valley districts of Manipur have adopted the variety with high level of satisfaction.

The need of more convergence among the various stakeholders involved in the production of the food systems have led to a number of recent studies in agricultural sciences related to stakeholders. The objective of the study was to identify and analyse the important stakeholders involved in diffusion of the CAU-R series more specifically CAU-R1.

MATERIALS AND METHODS

Research Design

The research design employed for the study was a descriptive and inferential research design which implies to observe and understand who, what, how and why of the system.

Sampling method

The sampling method used was purposive sampling and snowball sampling method to identify the stakeholders.

Method of data collection

Data was collected using a pre-tested structured interview schedule as primary tool and group discussions and key informant technique as secondary tool when required. The respondents were selected based on complete enumeration technique. The total numbers of respondents were 19 institutional stakeholders and 66 farmer stakeholders, totalling to 85. The data presented in this study pertains to three valley districts viz, Thoubal, Imphal East and Bishnupur where there

is more concentration of CAU R1 rice growers. The stakeholders were plotted on the ‘power to’ and ‘interest in’ map by taking the mean score of the key personnel from the CAU, Imphal involved in the diffusion of CAU-R series on a 10 point continuum. Based on the mean scores the stakeholders are categorised into four categories as High Power-High Interest, High Power- Low Interest, Low Power-Low Interest, Low Power-High Interest respectively.

RESULTS AND DISCUSSION

(I) Stakeholder Identification

The important stakeholders of the CAU-R series varieties were identified through the concerned authority of the Central Agricultural University, Imphal. Thereafter, other stakeholders were identified through snowball sampling technique from the earlier identified ones. Institutional stakeholders were 19 including public/ government organizations, media and non-governmental organizations. Farmer stakeholders included the farmers who actually understood who a stakeholder is and responded properly numbering to 66 from the three districts. According to Russo and Tencati (2009) stakeholders come in various forms such as formal, informal and differing sizes. Barzola *et*

al. (2019) recognized “typologies” as the group of stakeholders similar to one another in governance mechanisms and type of innovations. In this study, typology of stakeholders implies the governing agency and governance mechanism. A brief description of the identified stakeholders in terms of their typology, description, their roles and possible impact on the diffusion of the CAU-R varieties is explained in Table 1. It was observed that majority of the stakeholders identified are Public sector/ Government organisations The other category of stakeholders is the media, the farmer collectives and the civil society organizations. The stakeholders under the public domain governed by the public authorities are classified into sub-categories based on the nature of activities carried out as Policy makers, Academic Institutes, Research Institutes and Extension organizations.

Policy Makers

The Ministry of Agriculture and Farmers Welfare, Government of India and the Department of Agriculture, Government of Manipur constitute the policy makers. The Academic institutes include those institutes or organizations whose primary objective was imparting education while secondary objective was conducting research and extension

Table 1: Stakeholder in the diffusion of CAU-R varieties

Sl. No.	Stakeholder	Description	Role	Interest in the initiative	Likely impact of initiative on interest
	Ministry of Agriculture and Farmers Welfare, Govt. of India	It is an apex body for all policy related issues regarding agriculture and farmers welfare in the country	<ul style="list-style-type: none"> ♦ Policy formulation and Implementation ♦ Funding ♦ Facilitator ♦ M&E 	Increased crop production	(+)
				Food Security	(+)
				Sustainable Agriculture	(+)
				Livelihood of the farmers	(+)
	Department of Agriculture, Govt of Manipur	Responsible for all the agricultural activities in the state. Certified seed production by the state seed certification agencies and the National Seed Corporation. Conducts annual crop competitions and awards farmers with highest yield. This motivates the farmers to adopt HYVs.	<ul style="list-style-type: none"> ♦ Policy formulation & implementation ♦ Research ♦ M&E, ♦ Funding ♦ Input Supplier ♦ ToT, ♦ Publicity ♦ Facilitator and ♦ Coordinator ♦ Market linkages 	Overall state production and productivity	(+)
				Promote use of HYVs across the state	(+)
				Transfer of technology	(+)
				Policy Implication	(+)

(Cont...)

Central Agricultural University, Imphal	Premier academic institute involved in agricultural education, research and extension in the north eastern hill region of the country. CAU-R series were developed by scientists of CAU and the university has a key role in popularising the varieties among the farmers of the region	<ul style="list-style-type: none"> ♦ Policy formulation & implementation, ♦ Research, ♦ Developer, ♦ M&E, ♦ Funding, ♦ Input Supplier, ♦ ToT, ♦ Publicity, ♦ Facilitator and Coordinator, ♦ Market linkages 	University Mandate	(+)
			Increased production and productivity of the region	(+)
			Recognition&Awards	(+)
			Livelihood of the farmers	(+)
			Sustainable Agriculture	(+)
			Combating effect of climate change on Rice	(+)
Pandit Deen Dayal Upadhyay Institute of Agriculture Sciences, Bishnupur	The primary objective is to impart agricultural education at Graduation and Post-Graduation level.	<ul style="list-style-type: none"> ♦ Transfer of Technology, Facilitator and Coordinator 	Livelihood of the farmers	(+)
			Transfer of Technology	(+)
			Better inter-organization relation	(+)
			Sustainable Agriculture	(+/-)
Indian Council of Agricultural Research, RC-Manipur	Coordinating and conducting region specific research in Manipur	<ul style="list-style-type: none"> ♦ No role specific to CAU-R series varieties as the organization has developed their own HYVs in Rice known as RCM series and popularization of these is their primary goal. 	Promotion of HYVs released by ICAR	(-)
			Livelihood of farmers	(+)
			Increased Yield	(+)
			Organization mandate	(-)
			Recognition and Rewards	(-)
Rice Research Station, Wangbal, Thoubal	The primary objective is conducting experiments and research, demonstration of improved techniques of cultivation of rice and multiplication of improved and high yielding varieties of the crop.	<ul style="list-style-type: none"> ♦ Research, ♦ Transfer of Technology, ♦ Facilitator and Coordinator 	Improved research on rice	(+)
			Develop new varieties	(+)
			Transfer of technology	(+/-)
			Recognition	(+)
KVK Thoubal	The only KVK in the state hosted by the Department of Agriculture, Manipur. It was sanctioned by the ICAR in the year 2005. Active role in popularization and diffusion of CAU-R series varieties in Thoubal district.	<ul style="list-style-type: none"> ♦ Input suppliers, ♦ Research, ♦ Transfer of Technology, Facilitator, Coordinator 	Transfer of technology	(+)
			Organization mandate	(+)
			Livelihood of farmers	(+)
			Trainings	(+)
			Capacity Building	(+)
KVK Imphal East	This KVK is hosted by the KVK hosted by the Central Agricultural University, Imphal. It was sanctioned by the ICAR in the year 2005. The primary objective is to transfer technology and conduct vocational trainings to the farmers. Key player among the KVKs in popularization and diffusion of CAU-R series varieties in Imphal East district.	<ul style="list-style-type: none"> ♦ Developer, ♦ Input suppliers, ♦ Research, ♦ Transfer of Technology, ♦ Facilitator and Coordinator 	Transfer of technology	(+)
			Organization mandate	(+)
			Livelihood of farmers	(+)
			Trainings	(+)
			Capacity Building	(+)
KVK Bishnupur	This KVK, sanctioned in 2003 is hosted by the NGO Utlou Co-op Society Limited.	<ul style="list-style-type: none"> ♦ Input suppliers, ♦ Research, ♦ Transfer of Technology, Facilitator and Coordinator 	Transfer of technology	(+)
			Livelihood of farmers	(+)
			Trainings	(+)
			Capacity building	(+)

(Cont...)

KVK Imphal West	It is the oldest KVK in the state sanctioned in 1979. It is hosted by the ICAR-NEH, RC Manipur. The primary objective is to transfer technology and conduct vocational trainings to the farmers.	<ul style="list-style-type: none"> No role specific to CAU-R series varieties 	Transfer of technology	(+)
			Livelihood of farmers	(+)
			Popularization of ICAR released HYVs	(-)
			Recognition and Rewards	(-)
All India Radio	They serve as means of communication between the scientific community and the farming fraternity	<ul style="list-style-type: none"> Publicity, Facilitator and communication channels between farmers and other stakeholders 	Promotional activities	(+0)
			Facilitate technical support	(+0)
			Provide Market information	(+0)
Television (DoordarshanKisan)	They serve as means of communication between the scientific community and the farming fraternity	<ul style="list-style-type: none"> Publicity, facilitator and communication channels between farmers and other stakeholders 	Video Broadcast of agricultural technologies	(+0)
			Aid in Skill enhancement	(+0)
			Generate interest in adopting new HYVs	(+0)
			Feedback coordination between farmers and stakeholders	(+0)
Newspaper (Sangai Express)	Local newspaper widely circulated in the state	<ul style="list-style-type: none"> Publicity and facilitator 	Promotional activities	(+0)
			Information updates on availability of inputs	(+0)
Farmers	The farmers are those who practise farming as their primary occupation.	<ul style="list-style-type: none"> Cultivator 	High yield	(+)
			Technical and Market information	(+/-)
			Conservation of local rice varieties	(-)
			Increased income and livelihood	(+)
Progressive Farmer Club	The FBO is located at Nungbrung village, Imphal East district. The organization aims at providing assistance to the fellow farmers regarding best agricultural practices and techniques of improving the production.	<ul style="list-style-type: none"> Input suppliers, Transfer of Technology, Facilitator and Coordinator 	Farmer support	(+)
			Input Provider	(+)
			Mediators for channelling subsidized inputs	(+)
			Promote SMART Agricultural practices	(+)
			Seed Production through partnership	(+)
			Capacity Building	(+)
Langei Producer Company Limited – Yairipok Yambam	The FBO is located at Nungbrung village, Imphal East district. The organization aims at providing assistance to the fellow farmers regarding best agricultural practices and techniques of improving the production.	<ul style="list-style-type: none"> Input suppliers, Transfer of Technology, Facilitator and Coordinator 	Farmer support	(+)
			Input Provider	(+)
			Mediators for channelling subsidized inputs	(+)
			Promote SMART Agricultural practices	(+)
			Seed Production through partnership	(+)
			Capacity Building	(+)
Evergreen Vegetable Centre	The FBO is located at Yairipok Yambem, bordering village of Imphal East and Thoubal district. This organization is also associated with the CAU in the Participatory Seed Production Innovation system for CAU-R series varieties	<ul style="list-style-type: none"> Input suppliers, Transfer of Technology, Facilitator and Coordinator 	Increased vegetable production	(-)
			Marketing of vegetables	(-)
			Sustainable Agriculture	(+)
			Diversified farmer income	(+)

(Cont...)

Chingarel Wangma Loukol Lup	The FBO is located at Khurai village Imphal East district and was primarily established regarding irrigation facilities in the village	♦ No role specific to CAU-R series varieties	Improved irrigation facilities	+/0
			Improved Crop yield	(+)
			Better Market Price	(+)
			Capacity Building	(+)
Utlou Joint Farming cum Pisciculture Co-op Society Limited	The major objective of the organization is the upliftment of the rural society, optimum utilization of local resources	♦ Transfer of Technology, Facilitator, Coordinator	More focus on fishing activities	(-)
			Rice cum fish cultivation	(+/0)
			Transfer of technology	(+)
			Livelihood and social status of farmers	(+)
Meira Paibi	♦ Meira Paibi is a women based organisation functioning all over Manipur. The major objective is promoting women's participation in economic, social and political spheres of daily life.	♦ No role specific to CAU-R series varieties	Women torchbearers	(0)
			Societal Peace	(0)
			Capacity Building	(+/0)
			Food Security	(+)
			Improved livelihood	(+)

Legend: (+) = positive; (-) = negative; (?) = not known; (+/-) = positive but can be negative; (?/+) = not known but will be positive if implemented; (?/-) = not known but will be negative if implemented.

activities. The stakeholders under this category were the Central Agricultural University (CAU), and the Pandit Deen Dayal Upadhyay Institute of Agriculture Sciences, Bishnupur (Shaijumon, 2014). The Research organizations included the Indian Council of Agricultural Research (ICAR) for NEH Region, Manipur Centre and the Regional Rice Research Station, Thoubal. The extension organizations included the Krishi Vigyan Kendras whose primary objective was to transfer technology and conduct vocational trainings to the farmers (Medhi *et al.* 2017). The Mass Media included the All India Radio, Doordarshan Kendra Imphal and the local newspaper The Sangai Express. The media plays a very important and crucial role in agricultural development of a region by promoting awareness and broadcasting news on latest and advanced technologies in agriculture (Halakatti *et al.* 2019).

Farmers and farmer based collectives

The farmers and farmer based collectives were identified as major stakeholders whose primary objective was to work for the socio-economic development of the farmers and the rural society. Often we fail to realise them as important stakeholders and overlook their perspective and opinions due to which many innovations though very useful have failed to be adopted by the farmers (Wennink *et al.* 2007). In the present study six farmer based organizations were identified in the three districts.

Civil society organizations

Under the Civil society organizations, Meira Paibi a women based organisation functioning all over Manipur has been identified as an important stakeholder. They are also known as “Women Torchbearers” and “guardians of civil society”. (Aribam 2016).

(II) Timeline of Stakeholders in Diffusion of CAU-R series varieties

The importance of timeline is to identify which stakeholder has entered into the innovation system, at what stage and how their presence has influenced the system. Also the credibility and performance of the stakeholder can be accessed from the period of experience of the stakeholder in the society. In the present study timeline of all the stakeholders has been represented in the Fig. 1.

From the Fig. 1, it can be inferred that the stakeholders on the line were the active stakeholders involved directly in the popularisation and diffusion of CAU-R series varieties in Manipur. They were the CAU and KVK, Imphal East that initiated the programme in 2009 followed by farmers who were distributed with seeds of the CAU-R1 in 2009. In the year 2010, the Department of Agriculture, Manipur and KVK, Thoubal started participating in the popularization and diffusion of CAU-R1 variety. Apart from these, were the farmers and the Progressive Farmers Club, Imphal East took up the participatory seed production programme of CAU.

The All India Radio and the Doordarshan Television channel were contacted in 2010 for advertising about the CAU-R1 variety among the farmers.

In 2013, the Langei Producer Company Limited and the farmers associated with the organization started cultivating the CAU-R1 variety in their village. During the year 2015, the KVK Bishnupur in collaboration with the CAU has organized a programme for awareness and popularization of CAU-R varieties among the farmers of Bishnupur district. The stakeholders off the line in green colour are the ones who are not involved in the system but have varying degrees of interest in the innovation system and can be considered as important actors for the future extension activities. They are the Regional Rice Research Station, Thoubal, Utlou Joint Farming cum Pisciculture Co-op Society Limited, ICAR-RC Manipur, KVK Imphal West, Sangai Express (Local newspaper), Meira Paibi, Chingarel Wangma Loukol Lup, Evergreen Vegetable Centre and Pandit Deen Dayal Upadhyay Institute of Agricultural Sciences, Bishnupur.

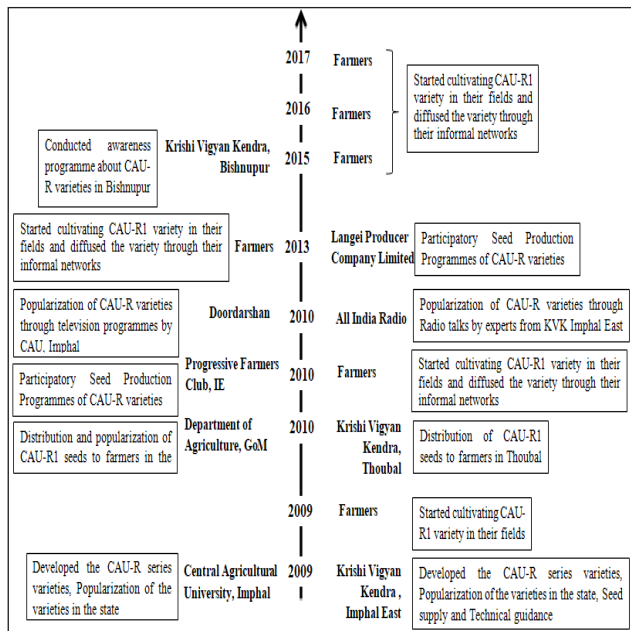


Fig. 1: Timeline representing the stakeholders

(III) Stakeholder Power and Interest Analysis

The power and interests of the stakeholders were documented while data collection. Power of the

Table 2: Stakeholders interest in diffusion of CAU-R series varieties

Common Interests	Stakeholders
Increased agricultural production and productivity of the State	<ul style="list-style-type: none"> ♦ Ministry of Agriculture and Farmers Welfare, Department of Agriculture, Government of Manipur, ♦ Central Agricultural University, Imphal ♦ ICAR-NEH, RC Manipur ♦ KVKs (Imphal East, Thoubal and Bishnupur)
Develop High Yielding Varieties of Rice	<ul style="list-style-type: none"> ♦ Department of Agriculture, Government of Manipur, ♦ Central Agricultural University, Imphal ♦ ICAR-NEH, RC Manipur ♦ KVKs (Imphal East, Thoubal and Bishnupur) ♦ Regional Rice Research Station
Socio-economic condition of the farmers	<ul style="list-style-type: none"> ♦ Department of Agriculture, Government of Manipur, ♦ Central Agricultural University, Imphal ♦ ICAR-NEH, RC Manipur ♦ KVKs (Imphal East, Thoubal and Bishnupur) ♦ Farmers ♦ Farmer based organizations
Popularization of advanced and improved technologies	<ul style="list-style-type: none"> ♦ Department of Agriculture, Government of Manipur, ♦ Central Agricultural University, Imphal ♦ ICAR-NEH, RC Manipur ♦ KVKs (Imphal East, Thoubal and Bishnupur) ♦ All India Radio, Imphal ♦ Doordarshan Television, Imphal ♦ Sangai Newspaper

(Cont...)

Provide adequate and timely technical advice on inputs and diagnostic services specific to CAU-R series varieties to the farmers	<ul style="list-style-type: none"> ◆ Department of Agriculture, Government of Manipur, ◆ Central Agricultural University, Imphal ◆ KVK Imphal East ◆ KVK Thoubal
Rewards and Recognition in terms of institution ranking, best technology awards, financial grants, best innovative farmer awards etc.	<ul style="list-style-type: none"> ◆ Department of Agriculture, Government of Manipur, ◆ Central Agricultural University, Imphal ◆ KVK Imphal East ◆ KVK Thoubal ◆ Farmers

Conflicting Interests

Stakeholders (with interest)	Stakeholders (with interest)
<ul style="list-style-type: none"> ◆ ICAR and KVK, Imphal West wants to continue with the popularization of ICAR- RCM HYVs of Rice in the State 	<ul style="list-style-type: none"> ◆ CAU and KVK Imphal East want more wide spread popularization of CAU-R series varieties of Rice
<ul style="list-style-type: none"> ◆ CAU, ICAR and Department of Agriculture wants farmers to adopt HYVs 	<ul style="list-style-type: none"> ◆ Many farmers want to cultivate local varieties as the HYVs are perceived as not so tasty compared to the HYVs

stakeholders in the innovation system was assessed by power attributes describing the power to allocate or deny resources, defining others tasks and responsibilities, controlling access to knowledge or information, decision making and channelling messages to other stakeholders (Kennon *et al.* 2009). The interest of the stakeholders in the innovation system were categorised into common interest and conflictive interests. This was done to identify the stakeholder group having common interest in the diffusion of CAU-R series varieties so as to formulate strategies to strengthen their relationship while the stakeholder groups with conflictive interests were identified to understand and plan for resolving the conflicts which if not may hamper the innovation system.

The vested interest of the stakeholders was documented during the interview of the respondents and classified as common interests and conflictive interests. The common interests of the stakeholders were increased agricultural production and productivity of the state, developing high yielding varieties of rice, improve the socio-economic condition of the farmers, popularization of advanced and improved technologies among the farmers, provide adequate and timely technical advice on inputs and diagnostic services specific to CAU-R series varieties to the farmers, recognition and rewards in the form of institution rankings, best technology awards, Best farmer and Innovative Farmer Awards. The CAU, DoA, MoAF, ICAR-RC, Manipur, KVK (Thoubal, Imphal East and Bishnupur), All India Radio, Television

and Sangai newspaper were the stakeholders with common interests. However, the conflictive interests were found in between the CAU and the ICAR-RC, Manipur, reason being that the ICAR-RC, Manipur has developed series of RCM varieties of Rice and extensively popularized them among the farmers. Hence their interest in CAU-R series varieties was contradictory. Similarly a few farmers were reluctant to cultivate the HYV's of Rice owing to tastier local variety than the CAU-R series varieties.

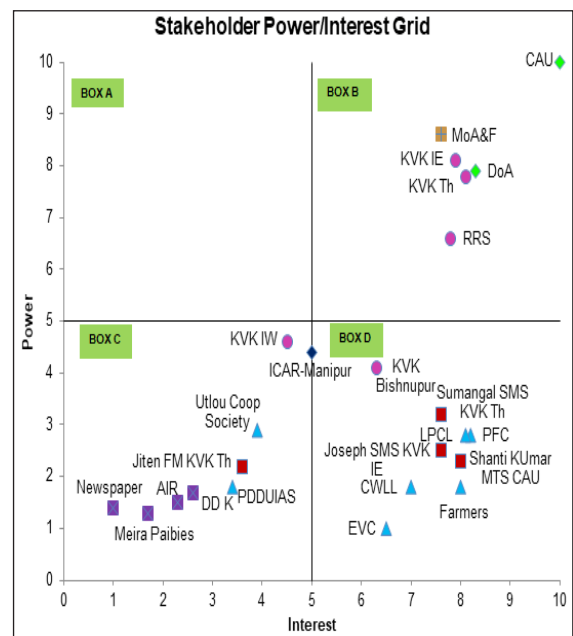


Fig. 2: Stakeholder Power/Interest Grid

On perusal with Table 4 and Fig. 2 we can distinguish the position of the stakeholders with regard to Power and Interest on a 10 point continuum.

The perceptions and responses were collected from the key personnel working in the Central Agricultural University, College of Agriculture, Iroisemba, KVK Imphal East and KVK Thoubal since these are the key organizations involved fully in the popularization and diffusion of the CAU-R series varieties in Manipur. The total number of respondents considered for the Power/Interest Matrix was 14. The mean scores of the all the 14 respondents was calculated and based on these values the power/interest grid was prepared. The results revealed that the respondents perceived the CAU, the Ministry of Agriculture and Farmers Welfare and the Department of Agriculture, Government of Manipur had high degree of power and interest in all the three districts while the ICAR-NEH, RC Manipur and KVK, Imphal West have neutral power and interest reason being as stated above they have their own Rice varieties namely RCM series which they are popularising among the farmers.

Table 3: Mean Scores of the Power and Interests of the Stakeholders in diffusion of CAU-R series varieties in Manipur

Stakeholder	Power (Mean Score)	Interest (Mean Score)
MoA&F	8.6	7.6
CAU	10.0	10.0
DoA	7.9	8.3
ICAR-RC Manipur	4.4	5.0
KVK Imphal East	8.1	7.9
KVK Imphal West	4.6	4.5
AIR	1.5	2.3
DD K	1.7	2.6
Newspaper	1.4	1.0
LPCL	2.8	8.2
PFC	2.8	8.1
CWLL	1.8	7.0
Joseph SMS KVK Imphal East	2.5	7.6
Meira Paibies	1.3	1.7
Farmers	1.8	8.0
KVK Th	7.8	8.1
RRS	6.6	7.8
Sumangal SMS KVK Th	3.2	7.6
Jiten FM KVK Th	2.2	3.6
Evergreen Vegetable Centre	1.0	6.5
KVK Bishnupur	4.1	6.3

PDDUIAS	1.8	3.4
Utlou Joint Farming	2.9	3.9
Shanti Kumar MTS CAU	2.3	8.0

Table 4: Interpretation of the Stakeholder prioritization matrix

Box	Interpretation	Suggestions
Box A	High Power to influence but low interest in the innovation system	Need special initiative, by concerned authorities to safeguard their interest
Box B	High Power to influence and high interest in the innovation system	Very important category and strong relationship needs to be maintained among these stakeholders
Box C	Low Power as well as interest in the innovation system	Not so important but need to be monitored regularly and evaluated
Box D	Have high interest in the innovation system capable of bringing desirable outcomes but with limited power to take decisions	Need careful monitoring and evaluation

Also in all the three districts, the media i.e., All India Radio, Doordarshan, Newspaper and Meira Paibies had low interest and power. Farmers in all the three districts have shown high level of interest in the diffusion of CAU-R series varieties owing to its high production compared to other HYVs cultivated but their degree of power to implement or change any unfavourable regulation is highly limited. According to the suggestions given in Table 4 it is advisable to include farmers in the diffusion of CAU-R series varieties, regular monitoring of the crop performance at their fields, provision of required inputs on a timely basis, feedback of the crop and most importantly provide for market linkages to improve their economic stature. Also the Farmer based organization i.e., Progressive Farmers Club and Langei Producer Company Limited which are at present actively involved in the innovation system also need careful monitoring and their feedback given due consideration. The Krishi Vigyan Kendras in Imphal East and Thoubal are working sincerely for the innovation system while the Krishi Vigyan Kendra Bishnupur has interest but not involved full fledgedly in the innovation system. If this KVK along with its host institute Utlou Joint Farming cum Pisciculture Co-op Society Limited and Pandit Deen Dayal Upadhyay Institute of Agriculture Sciences can be considered as important stakeholders in Bishnupur district. The results were

in partial similarity with the study conducted by Ponkka (2017).

CONCLUSION

The observations and results obtained in this study reveals that among the institutional stakeholders the Central Agricultural University has the ultimate power and authority followed by the Department of Agriculture, Government of Manipur. This study will serve as a roadmap to the host institute the Central Agricultural University in engaging the important stakeholders for their future research projects. Participatory mode of research involving all the stakeholders at the relevant stages of the innovation system will give more focussed and desired results.

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