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IMPROVING AGRICULTURAL RESEARCH COORDINATION AT SUBNATIONAL LEVEL IN INDONESIA: AN ASSESSMENT OF OPPORTUNITIES FOR STRENGTHENING PROVINCIAL TECHNOLOGY COMMISSION

Haji Saediman

Department of Agribusiness, Faculty of Agriculture, Halu Oleo University, Kampus Bumi Tridarma, Kendari, Indonesia.

ABSTRACT

The study aimed to better-understand (1) the performance of the PTC (Provincial Technology Commission), and (2) issues affecting, and ways of strengthening PTC to better align AIATs (Assessment Institute for Agricultural Technology) programs and activities with provincial needs and priorities. The study was conducted through assessment of and discussions with PTC members in some provinces during the period of 2007-2014. The study results showed the PTCs have not been able to adequately fulfil their mandate because of problems with: membership, perception and understanding of the PTC's mandate, financial resources, the focus of many AIAT research activities on nationally-initiated programs, coordination between provincial and district governments, and timing of PTC meetings. To improve the effectiveness of the PTC, the following measures are suggested: improve the representativeness of stakeholders in its membership, identify and enable a more active role for the Technical Team, ensure budget support for participation of the appropriate Dinas offices, renew/review regularly the Governor's decree, document recommendations of each PTC meeting and disseminate to all key stakeholders, improve AIATs' collaboration with all PTC stakeholders, build the capacity of AIATs to enable effective knowledge exchange, and monitor the effectiveness of the PTC in bringing about better delivery of impact.

Keywords: Provincial Technology Commission, AIAT, research coordination, agricultural technology, assessment.

INTRODUCTION

Indonesian Agency for Agricultural Research and Development (IAARD) is one of the largest agricultural research institutions in the developing world and over the years has made significant contributions to support Indonesian agricultural and rural development. Its tangible products in terms of high yielding varieties, integrated cropping systems, post-harvest technologies, vaccines, agricultural machinery and policy recommendations at different levels, among other key supporting elements for agricultural developments and the achievement of food security, are substantive in scope and impact (IAARD, 2011; Trigo, 2010). The main tasks of IAARD in national agricultural innovation system are (a) to create or produce advanced and strategic agricultural technology

and innovation, (b) to adapt such technology and innovation to become user- and location specific, and (c) provide basic information of such technology and innovation (Badan, 2004). The first above-mentioned IAARD task is undertaken through researches done at various research centers and institutes, whereas the second and the third tasks are accomplished through assessment and information transfer activities conducted at province-based Assessment Institute for Agricultural Technology (AIAT). Extension, advocacy, and facilitation activities in order for the innovation to be widely adopted by farmers and other end-users should be done by province and district level offices of agriculture and of extension. In other word, the role of IAARD in the innovation system rests mostly in the generating subsystem, while in the delivery and receiving subsystems is limited (Musyafak & Ibrahim, 2005). The main duty of AIATs is to provide recommendations on locally-adapted agricultural

* Corresponding Author:

Email: saediman@yahoo.com

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technologies, which are resulted from evaluation of research outputs supplied by research centers and institutes. AIATs are then expected to convey locally adapted technologies to provincial and district level offices of agriculture and of extension. To fulfil this effectively, they need to coordinate with key relevant stakeholders at provincial level, especially the different Dinases. An institution established in each province as a coordination forum for AIAT and stakeholders is called Provincial Agricultural Technology Commission (hereafter called as PTC) whose role is to ensure broad and on-going representation of stakeholders in prioritising R&D needs and in discussing the outcome of technology assessment. An active PTC is needed to better align AIAT activities with provincial programs and priorities.

In recent years, there has been concern that the speed and level of utilization of innovation produced by IAARD has been slow and even stagnant (Musyafak and Ibrahim, 2005; Irawan, 2004). While many IAARD technology packages are not reaching the farmers, the farmers and industry are of opinion that its technologies are not completely appropriate or relevant to their needs (IAARD, 2011; Indraningsih *et al.*, 2014; World Bank, 2008). This implies that the issue of technology application is not only related to the bottleneck in delivering and receiving subsystems as argued by Musyafak & Ibrahim (2005), but also to the lack of participatory decision making on research priority setting and packaging (World Bank, 2008; Trigo, 2010). With respect to the latter, IAARD through AIATs actually can better respond to technology needs and innovation demand from a whole range of provincial stakeholders through PTCs. However, there has been concern in the functioning and performance of the PTCs as priority-setting, monitoring and evaluation mechanism.

The objectives of this study were (i) to understand the present status and functioning of PTC, (ii) to gauge the perception of membership of the performance of the PTC and the issues affecting its performance, and (iii) to identify ways of strengthening the PTC as a forum for coordinating research and assessment activities at the province level.

METHODOLOGY

This paper was prepared mainly from the results of assessment of PTC conducted from December 2007 to April 2008 as part of ACIAR-SADI subprogram. The

assessment was done in the four provinces in Eastern Indonesia: Southeast Sulawesi, South Sulawesi, East Nusa Tenggara, and West Nusa Tenggara. Information from the assessment in 2007-2008 was supplemented and updated with information obtained during field visits to AIATs in the provinces of West Java, North Sumatera, and West Sumatera in June 2011. In order to update the previous findings, semi-structured interviews were held with staff at AIAT, Dinas for Agriculture, and Extension Coordination Agency in Southeast Sulawesi province in June 2014.

Study design: This study adopted a qualitative research approach. This approach was chosen as the study questions were qualitative ones and the study wanted to understand the perception and perspectives of respondents about the PTC functioning and performance, and observe the process of PTC meetings in depth (Brikci & Green, 2007). The qualitative methodology enabled more flexibility so that respondents had the opportunity to respond more elaborately and in greater detailed whereas the researcher had the opportunity to respond immediately to what respondents had said. Deductive thematic analysis was used: questions were asked based on the results of preliminary investigation and the themes identified from the data were fit into the preconceived analytical frame (Boyatzis, 1998). This approach was considered appropriate because the researcher had already had specific questions made on the basis of preliminary investigation, to identify the main themes or categories to group the data and then look for similarities and differences.

Respondents: Membership of the PTC consists of the head of provincial level relevant Dinases, deans at province-based universities, farmers' associations, chambers of trade and commerce, the head of the Provincial Research Agency, etc. Most of them are ex-officio members (appointed because of their position). For the assessment in 2007-2008, population of the study was all 96 members of PTCs in the provinces of Southeast Sulawesi, South Sulawesi, West Nusa Tenggara and East Nusa Tenggara. A total of 30 members of the PTCs in the four provinces were purposively selected as respondents (Table 1) based on the significance of their position in the PTC and their availability. This number of respondents was determined to be adequate to answer the research questions.

Table 1. Study Respondents in Each Province During PTC Assessment in 2007-2008.

Province	PTC Members	Respondents	Respondents' Institute/Organization
Southeast Sulawesi	12	8	AIAT; Provincial Research Board; Fac. of Agriculture UHO; Provincial Development Planning Agency; Dinas for Estate Crops and Horticulture; Dinas for Cooperatives and SME Development; Provincial Research Agency; Dinas for Agriculture
South Sulawesi	31	6	AIAT; Provincial R&D Agency; Provincial Development Planning Agency; Dinas for Agriculture; Research Institute UNHAS; Fac of Agriculture UNHAS
West Nusa Tenggara	28	8	AIAT; Provincial Development Planning Agency; Dinas for Livestock; Faculty of Agriculture UNRAM; Faculty of Animal Husbandry UNRAM; Research Centre UNRAM; Provincial Research Board; Dinas for Agriculture
East Nusa Tenggara	25	8	AIAT; Provincial Development Planning Agency; Dinas for Agriculture; Dinas for Estate Crops; Nusa Cendana University (Fac. of Agriculture; Fac. of Livestock Sciences; Research Centre); Provincial Research Board

For the assessment in June 2014 in Southeast Sulawesi province, the interviewees were two researchers at AIAT, two staff at Dinas for Agriculture, and two staff at Extension Coordination Agency.

Data collection

Interviews: For the assessment in 2007-2008, data was collected by means of qualitative in-depth interviews. The interviews were semi-structured and lasted 1- to 1.5 hours. They were based on an interview guide which was thematically organised. The respondents were asked about the PTC activities, performance of PTC, factors affecting PTC performance, and proposed ways of revitalizing it. Open-ended responses were allowed and probing was extensively used to uncover as much

information as possible. All interviews were conducted in Indonesian at the office of the respondents. The data were grouped into several themes, which again were divided into relevant sub-issues.

For the assessment in 2014, the same procedures were employed. However, for the interviews with staff at Extension Coordination Agency the interview questions were slightly modified to also cover the coordination of PTC activities and those of Extension Commission.

Direct observation: The researcher had the opportunity to attend PTC meetings in each of the four study provinces (Table 2). This direct observation was useful to understand fully the dynamics of the PTC meeting including its process, participants, and program.

Table 2. PTC Meeting Attended by Researcher during 2008-2010.

Province	PTC Meeting Attended by Researcher
Southeast Sulawesi	25 Nov 2008; 25 May 2010
South Sulawesi	24 Dec 2008; 19 May 2010
West Nusa Tenggara	30 Oct 2008; 22 Apr 2009; 29 Apr 2010
East Nusa Tenggara	28 Oct 2008; 12-13 Mar 2009; 12 May 2010

Focus Group Discussions: During the visits to AIATs in the provinces of West Java, North Sumatera, and West Sumatera in June 2011, the researcher held discussions with the staff at each AIAT. The discussions provided information about the general status and performance of PTCs in the respective provinces, including the issues the PTCs were facing and the likely solutions to the issues. The discussions had served as a venue to validate the findings in the PTC assessment conducted before in the four provinces in Eastern Indonesia.

Data analysis: In view of the open ended nature of the study questions and semi-structured data collection methods, the data were analyzed qualitatively using deductive thematic analysis. With this method, a structure or predetermined framework was used to analyse the data. In order to maximize the validity of findings, the researcher used triangulations method through deliberately seeking evidence from a wide range of sources and comparing findings from those different sources.

RESULTS AND DISCUSSION

Provincial Research Coordinating Institutions: Balitbangda, Dewan Riset Daerah (DRD), and the PTC are the three institutions involved in coordinating research at the province level.

The Provincial Research and Development Agency (Balitbangda): The legal foundation for the establishment of Balitbangda in each province is Law No 18/2002 regarding the National System for Research, Development, and Application of Science and Technology. The law states that the function of the provincial government is to develop the motivation, provide stimulation and facilities, and create a conducive environment for the development and synergy of institutions, resources, and networking of science and technology in its respective area. To implement this function, the provincial government may develop policy instruments in the form of budget support, resources and facilities, provision of incentives, research activities, and establishment of institutions. In this regard, science and technology institutions can be both research and development (R&D) institutions and institutions supporting the provincial government. An R&D institution that emerged in response to this law, and whose existence is confirmed in Law No 32/2004 regarding Regional Administration, is the Provincial Research and Development Agency (Badan Penelitian dan Pengembangan Daerah, or Balitbangda).

Being an R&D institution, Balitbangda is a key actor (pelaku) in the implementation of R&D activities. Its main duties are to coordinate the drafting of policy and implementation of R&D, to coordinate the use of R&D activities for the purpose of provincial planning, and to conduct researches on some priority areas. It has budget for research activities, which it might conduct itself or collaborate with other implementing organisations such as universities and NGOs. The main weakness of Balitbangda is related to the availability of human resources and facilities. As a new institution that deals with research activities, it has been facing lack of qualified human resources who can support the attainment of its responsibilities. All of their staff come from a few different provincial institutions and do not have a research background. Because of this problem, Balitbangda gets support from the Provincial Research Board in the implementation of its activities. In conducting research, Balitbangda collaborates with

provincial implementing organisations such as universities, consultancy companies, and NGOs.

The Provincial Research Board (DRD): Law No 18/2002 also stated that the implementation of the provincial government's function described above requires the formulation of priority and policy frameworks in the form of strategic policy or planning for the development of science and technology in the province. To support the formulation of these priority and policy frameworks for research, development, and application of science and technology, provincial governments have established Dewan Riset Daerah (Provincial Research Boards) whose membership should come from all elements of the research and technology institutions in the province. A strategic policy for research and technology development in each province is needed in order for all stakeholders to understand the direction, priorities and policy frameworks in the fields of research and technology development.

In the Indonesian context, this means that while Balitbangda is a structural institution in the provincial administration, DRD is not. Balitbangda is a R&D institution and DRD is a supporting institution. Supporting institution here means an institution whose activities are related to the provision of support to the implementation of activities for utilisation, advancement, and ownership of science and technology. In practice, however, DRD activities are usually attached to Balitbangda. In addition, DRD supports the provincial government in coordinating research activities with other provinces, and represents the concerned province on the National Research Board.

Both DRD and Balitbangda are intended to strengthen the realisation of regional decentralisation in research and technology development. As well as empowering research and development organisations in the province, DRD provides input to the government on matters such as: (1) mapping provincial needs for science and technology, (2) formulating the directions of research and technology development in line with the potential of the province, (3) deciding on the main priorities for research and technology development and (4) monitoring and evaluation of provincial policies on research and technology development. In practice, DRD membership comes from provincial universities, provincial government organisations and BPTP. Membership structure usually consists of the head, vice head, secretary, and members. There is also secretariat

which is located at Balitbangda and is often led by the secretary of Balitbangda. Depending on the province, members might be divided into some commissions. For example, in South Sulawesi, there are four commissions namely improvement of quality of human life, improvement of regional economy, improvement of quality of social and community life, and empowerment of governmental and social institutions.

The Provincial Technology Commission: To support the attainment of a more efficient and integrated process in the preparation and application of agricultural technologies, the Minister of Agriculture issued Regulation No. 03/2005 defining Guidelines for Preparation and Application of Agricultural Technologies. According to this regulation, institutions involved in research and application of agricultural technologies consist of structural institutions and non-structural institutions. It also stipulates four stages in the mechanism for technology preparation and application, consisting of research, assessment, development, and application stages (Figure 1). The PTC is a non-structural institution established to improve integration between policy and implementation relating to agricultural research and technology development programs in the province.

It is a coordination forum established by gubernatorial decree, with membership coming from Bappeda, Balitbangda, Provincial Secretariat Office, AIAT and Agriculture-related Dinases. It is headed by either Bappeda or Balitbangda with the AIAT acting as the secretary. The designation of Bappeda or Balitbangda as the institution to lead the forum is related to their roles in coordinating the development planning (for Bappeda) and research activities (for Balitbangda), thus facilitating the alignment of AIAT activities with provincial program and priorities. In addition, from the AIAT perspective, Bappeda or Balitbangda leadership is important for the smooth functioning of the forum given the higher echelon¹ level of its membership. Despite slight variations from province to province, the PTC essentially has four duties and responsibilities namely: (1) deciding on strategic policies regarding preparation and

implementation of agricultural technology in the province, (2) providing directives and recommendations in agricultural technology assessment activities, (3) coordinating assessment and implementation of agricultural technology according to the needs of farmers, private sector, and other users in the area, and (4) providing recommendations and feedback toward the process of preparation and implementation of agricultural technologies.

Figure 1 shows that both AIAT and the PTC are in the technology assessment stage. AIAT conducts adaptive research (assessment) by examining the technology or research results produced at central research institutes to produce location-specific technology. The detailed relationship of AIAT and the PTC according to the regulation can be described as follows:

- a. Together with AIAT, the PTC helps identify technology and research results produced at central research institutes that will be tested further for local adaptation, taking into account agricultural program development in the area.
- b. AIAT tests the adaptability, multi-location, and farming system of the identified technology or research results. The result is location-specific technology recommendations, which are then reported to the PTC.
- c. The PTC gives recommendations to the technology development organisations to conduct technology development activities related to the location-specific technology recommendations from AIAT.
- d. From that point, process then enters the technology development stage, which produces development models and location-specific technology packages. The main actors in this stage are R&D organisations at the province level, but the PTC can be involved in the formulation of policy recommendations to both provincial and district government to utilise the development models and technology packages. The process then enters the final stage of technology application.

In 2008 Ministry of Agriculture issued Regulation No. 20/2008 regarding the Guidelines for Writing and Evaluating Research Proposals in IAARD. Even though this new Regulation was not intended to replace the previous one (Regulation No. 3/2005), it contains some revisions on the research and development processes that now consist of the following four stages: (1) research stage, (2) verification stage, (3) assessment

¹ AIAT is at the echelon III level, while Bappeda and other Dinases at echelon II level. Because of this difference in echelon level, head of Bappeda or Balitbangda serves as the head of PTC whereas the had of AIAT as the secretary of the commission.

stage, and (4) dissemination stage. However, the essential part regarding the actors, their tasks and responsibilities, and how they are expected to collaborate each with other is largely the same as in the previous regulation. More importantly, under the new regulation, AIATs are required to identify the topics for their upcoming assessment and dissemination activities through PTC meetings.

AIATs are specifically required to discuss the list of technology research needed, and/or feedback on the technologies that have been disseminated to users at a meeting of the PTC. At the national level, every year there has been Link and Match Workshop involving all AIATs, Central Research Institutes, and AARD to discuss the matching of technical research being conducted with users' feedback. Thus, the new Decree reaffirms the

importance of the PTC in deciding research priorities and planning the research and assessment activities at AIATs. To support the implementation of PTC duties and responsibilities, there exists a Technical Team for Agricultural Technology Assessment. The team is established under the same governor's decree with the main task of preparing any technical aspects of the materials, topics and program to be discussed in the PTC meeting. Its membership consists mainly of second-level officers at agriculture-related Dinases.

The Technical Team is led by the Head of the AIAT, and the secretary is the Head of the Collaboration and Dissemination Section in the AIAT. However, as with the PTC, the Technical Team's in each province have been generally inactive for reasons more-or-less similar with those with the PTC.

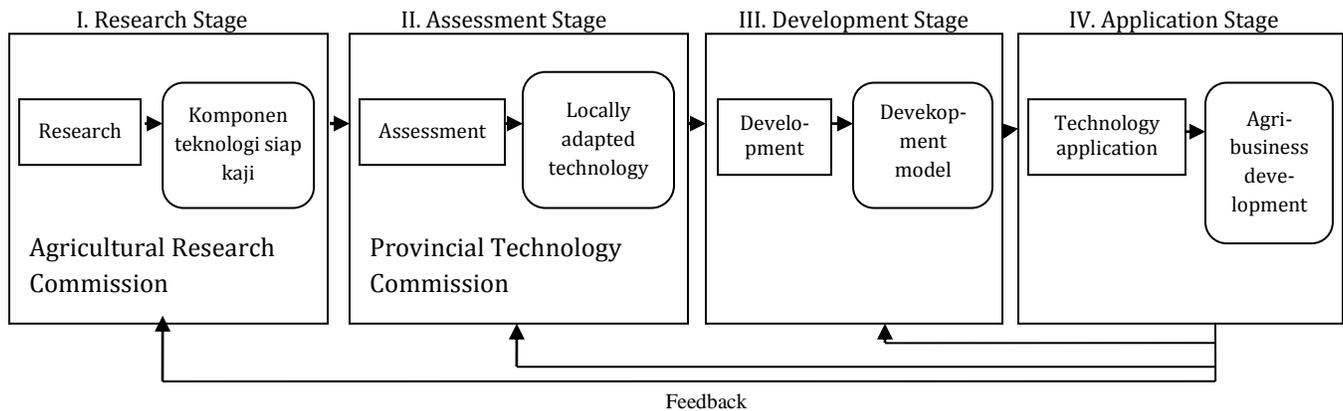


Figure 1. Stages in the preparation and application of agricultural technology.

Performance of the Provincial Technology Commissions: The performance of the PTCs can be assessed from their effectiveness, relevance, and financial viability. Effectiveness refers to the extent to which the commission is able to fulfil its mission and goals. Relevance means the ability of the PTC to align its mission and goals with the needs of its stakeholders. Financial viability is the ability of the commission to raise the funds required to meet its functional requirements in the short, medium, and long term.

Effectiveness: The first step in assessing the effectiveness of the PTC was to understand its functional purposes, the extent to which the members of the PTC understand these purposes and whether their understanding is consistent from one member to another. As no set of indicators for measuring the effectiveness of the PTC have been developed, the next step was to develop a list of indicators to guide information collection. The simple indicators that were

developed around the objectives of the PTC were (1) the number of meetings conducted in a year, (2) the number of suggestions/directions it produced related to the planning and preparation of agricultural technology assessment activities, (3) the number of recommendations made relating to the implementation of technology assessment activities, and (4) the number of PTC recommendations on the technologies to be released.

The number of meetings that each PTC has been holding in a year varied from province to province. With the exception of PTC in West Nusa Tenggara, the number of meetings in all other PTCs showed a common decreasing trend in recent years compared to the years before the implementation of regional decentralisation in 1999. Ideally PTC meetings were conducted at least twice a year, namely at the beginning and at the end of the year. With the former, AIATs can obtain feedbacks to improve their programs and activities and to keep them in line

with the needs of provincial stakeholders and end-users. With the latter, AIATs can obtain feedbacks on the results of their assessment and dissemination activities, and on the technology packages to be recommended. In practice, however, in most of the provinces PTC meetings were conducted only once a year, and even once in two or three years. AIAT argued they did not conduct particular PTC meeting, but conducted other meetings that involved key PTC members. Such meetings were conducted as part of other AIAT activities so AIAT used the meetings as socialisation and coordination forum with other stakeholders in the province.

The low number of PTC meetings means that the PTC cannot be expected to produce the set of outputs that form the essential purpose of its establishment. It is unable to provide inputs for the improvement of research planning and to provide feedback on the assessment activities that have been implemented at AIAT. Also, it no longer produces recommendations of technologies that will be released in the province.

Despite the absence or low number of PTC meetings, the AIATs seem to maintain good working relationships with provincial Dinases and universities. This was achieved through meetings, committees, personal contacts and joint research activities. For example, AIATs sometimes invite Dinases, university and other stakeholders to attend gelar teknologi (technology shows) and seminars/workshops for research proposal development and dissemination of results. The provincial government might invite the AIAT to attend a Musrenbang (Development Planning Workshop) at the district and provincial level, or seminars/workshops at the Dinases. There were also meetings in the context of a particular committee (for example, food security, extension, agribusiness development) that involved AIAT, Dinas and others. Some AIATs have even included in groups of researchers from provincial universities with the range of expertise needed to assist in the planning and implementation of research and assessment activities.

Such meetings, committees and collaboration were, however, generally focused on certain topics and did not encompass the comprehensive information on agricultural technology research planning and implementation in the province envisaged in the role of the PTC. Therefore, regardless of the intensive contacts between the AIAT and its stakeholders through the various ad-hoc means described above, the objectives of

the PTC could not be achieved so long as the PTC meetings were not held. This is important to emphasise as, to some extent, the AIATs feel that the PTC meeting may not be necessary as its members can always meet each other in various ad-hoc activities or forums.

Relevance: As a forum, the PTC must be, and must be seen to be, continually relevant to their stakeholders. Because the PTC membership comes from various agricultural Dinases and organisations, members themselves are key stakeholders in AIAT research and assessment activities in the province. So relevance here was not about how external stakeholders view the PTC, but how the members themselves view the PTC. In this respect, relevance for stakeholders was reviewed by conducting interviews with the PTC members to seek information on how satisfied they were with the ability of the PTC to align its mission and goals with the needs of its stakeholders. Key questions included (1) has the commission adapted and changed its work over time, and (2) are the missions of the commission regularly reviewed?

PTC's have been present since 1995 following the issuance of Minister of Agriculture's Regulation No. 804/1995 regarding Guidelines for Preparation and Implementation of Agricultural Technology Packages, which was revised by Minister of Agriculture regulation No. 03/2005 regarding Guidelines for Preparation and Implementation of Technology Packages. These regulations mentioned the need to have a Technology Commission at the province level, and have become the legal foundation for forming the commission at each province.

Regulation No 03/2005 was in principle issued as a response to significant changes in the research environment, especially with the execution of regional decentralisation. While the PTC was formed to cope with such changes at the province level, very few activities have been conducted to review its mission and to adapt and change its work over time. On one hand, this clearly has something to do with the relatively inactive status of the PTCs. On the other hand, the members still regard the PTC goals and missions as important for and relevant to the provincial agricultural development needs in general and technology assessment in particular. In other words, despite the low performance of the PTC in terms of fulfilling its functions and goals, most PTC members still regard the existence of the PTC as very important in contributing towards agricultural

development in their respective provinces. What is important, then, is to look for ways of revitalising the PTCs. The process of crafting PTC mission statements is also worth mentioning. The draft of the Governor's SK (appointment letter) was made by the AIAT and handed to either Bappeda or Balitbangda to get the Governor's approval. During the initial period of PTC establishment, it is understandable that AIAT alone drafted the goals and missions on the basis of Permentan, but as time goes by there is a need to review and develop the missions together with PTC members. The process of developing the mission statement could, in itself, be a useful exercise in attaining similar perceptions among members and strengthening their sense of belonging to the PTC. Through developing the mission statement, members can ensure that they are seeing the "big picture" of what the PTC can be, and how it can become a more effective forum.

Financial Viability: In all provinces, the source of funding for PTC activities is solely from the AIAT's budget. With the relative decrease of AIAT budgets over recent times, it is increasingly difficult for the AIATs to allocate a portion of their budget to support PTC activities. Furthermore, the development of an active and effective PTC is as important to the interests of each provincial government as it is to the AIATs and ICATAD (Indonesian Center for Agricultural Technology Assessment and Development).² So the challenge here is how to ensure a continued flow of funds from diverse sources, including from provincial-government budgets. While lack of budget was frequently stated as one of the reasons for not conducting PTC meetings/activities, until the time of assessment in 2008 AIAT in West Nusa Tenggara has secured funds for (and successfully conducted) PTC meetings regularly twice a year. Whether this is only a matter of prioritising the activities within the allocated budget, or due to the presence of some donor-sponsored projects that in turn contribute to the availability of funds for AIAT activities, is something worth investigating by other AIATs. In this respect, ICATAD needs to play a role in ensuring the incorporation of PTC-related activities in the budget proposals that AIATs submit each year.

Major Issues Affecting PTC Performance: Major issues identified as having affected the performance of the

Provincial Technology Commissions were as follows:

Membership: Membership of the PTC consists of the head of agricultural Dinases, deans at province-based universities, farmers' associations, chambers of trade and commerce, legislative members, the head of Bappeda, and the head of the Provincial Research Agency. They are all ex-officio members (appointed because of their position). With the frequent replacement of the heads of the Dinases and other institutions within the provincial administration, there are problems with the consistency of understanding of the PTC's roles and functions. This is especially true as the Legal Decision for establishing the PTC has not been regularly revised/reviewed. In fact, most members who were involved at the initial establishment of the PTC have been replaced or moved to other positions. As a result, many of the present members are unlikely to have seen the Legal Decision and so may not have a clear understanding of the PTC missions and goals. Perception and understanding of PTC and of its goals and missions. While the PTC was established to be a forum for coordination among various stakeholders linked to agricultural technology development, providing the opportunity for consensus on priorities for research and assessment, the degree of commitment and the sense of belonging on the part of some members is not strong. Often, provincial agencies send junior staff to represent them on the PTC and also send different people to attend different meetings resulting in a lack of continuity in commitment to the goals and mandate of the PTC. The absence of senior staff and the participation of different people in different meetings limits the ability of the PTC as a decision making forum as frequently it deals with policy issues that can only be handled by the heads of institutions. When it comes to these policy issues, participants who are second or third-level officers are usually unable to make the decisions and commitment required.

The perception of the agricultural Dinases towards the PTC may be related to the rationale for establishing the commission. Despite the general justification of the importance of the PTC as elaborated in the Permentan No 03/2005, many Dinases tend to think that the commission is formed to support AIAT activities in relation to its coordination with provincial stakeholders. PTC practices and procedures confirm this belief, and have led to misunderstanding of the PTC mission. Furthermore, the lower echelon level of AIATs (echelon 3) compared with

² One of the Centers in Indonesian Agency for Agricultural Research and Development, which supervises AIATs.

Dinases (echelon 2) and the fact that AIAT activities are funded under national budget might also contribute to the low priority many heads of Dinases give to the PTC meeting.

Financial Sources: Based on the SK that has become the basis for the establishment of the PTC, the source of finance for commission activities should come mainly from the AIATs. When the AIATs had enough budget, it was relatively easy to allocate some funds to support PTC activities. However, as the AIATs have been struggling with lack of funds, they have reduced or even cut altogether the funds allocated for the PTC. According to the AIATs interviewed, the lack of funds is one of the main reasons for the absence or reduced number of PTC meetings. Thus, it is important to look for ways to support the PTC through allocation of provincial budget. The nature of AIAT activities in recent years. In recent years AIATs have been heavily involved in nationally-initiated programs such as Prima Tani, FEATI, SLPTT, PUAP, and PSDS (Sarwani, 2011). These programs are more dissemination-oriented and designed to accelerate the transfer of agricultural technologies to next users and farmers. They are also intended to become a vehicle of participatory assessment to implement the new paradigm of IAARD from Research and Development to Research for Development. Despite its promising features, however, the dissemination-oriented nature of the nationally initiated programs presents some difficulties for the AIATs in relation to the PTC. The dominance of dissemination-oriented activities has directly led to a reduction in assessment activities and, therefore, a reduction in new technology options that can be recommended for wider dissemination, both of which constitute the core rationale of having the commission. It seems that the AIATs are reluctant to seek input from provincial stakeholders to incorporate into the proposals for assessment activities as it is likely that these proposals will be rejected at the national level. Furthermore, AIATs feel vulnerable if asked to present nationally-designed programs that are dissemination-oriented to the PTC members for comment. The expectation is that these programs will be strongly criticized.

This difficult position makes some AIATs reluctant to hold the PTC meeting. On one hand, they feel obliged to obtain inputs from provincial stakeholders in planning, preparation and implementation of upcoming assessment activities but, for the reasons outlined above,

they feel the PTC meeting is no longer an effective forum. Rather it can become a forum where AIAT is criticized for conducting activities that are not responsive to local and user needs. The AIATs which prefer to be on the safer side choose not to conduct meetings.

The general trend towards dissemination-oriented activities in the AIATs also affects the performance of the PTC in terms of its relevance. Reduced ability to incorporate stakeholder needs into their activities simply means reduced ability to meet stakeholder expectations and to anticipate their needs. This could further contribute to the feeling that the PTC is only a forum to discuss AIAT activities and members might fail to see the bigger advantages of having the PTC to coordinate the preparation and application of agricultural technology in the province at the assessment stage, development stage, and application stage.

The nature of coordination between provincial and district government: The regional decentralisation that has been implemented since 1999 has weakened the role of provincial governments as representatives of the national government. The present legal framework has granted new power to district governments to plan and implement more-independently their development programs. This profoundly affects the nature of the relationship between the provincial and district governments. As acknowledged by respondents from the provincial Dinases, since the implementation of regional decentralisation, coordination with district-level Dinases has become more difficult. They described the condition as being very different from that in the period before decentralization when all activities conducted in the districts or in farmers' fields could easily be coordinated from the province level.

The current challenges in coordination between the provincial and district governments have some implications for both the PTCs and the AIATs. To be effectively implemented, strategic decisions adopted at the PTC meetings need to be in accordance with District programs and priorities. Consequently, despite agreement by the PTC regarding particular activities, AIATs may still have to discuss these with (and convince) District Dinases prior to their implementation in the field. In future, implementation of AIAT research, assessment and dissemination activities in the field will require cooperation from the district government. For these reasons, AIATs might prefer to work directly with

the district rather than with the province (PTC). The PTC in NTB has endeavoured to solve this by including representatives from District government in the membership, which might also be applied in other places.

Timing of the PTC meeting: The PTCs are expected to conduct meetings twice a year. To be effective, however, they need to consider carefully the appropriate timing for the meeting. This is related to the difference of the budget planning period between the AIATs and the provincial government. For the AIATs, budget planning starts with the submission of the program matrix at the beginning of the year (February-March), while the provincial institutions commence the process in the second half of the year (August). This difference in the budget planning period is significant if the AIATs want to align their activities with that of the provincial institutions. Most respondents said that PTC meetings were more to justify what the AIAT had planned to do than to seek information from other stakeholders that the AIAT could then use to plan its activities. This is related to the timing of the meeting, which may become more important if the PTC later tries to expand its activities to cover all its objectives.

Opportunities for Improving Coordination of Agricultural Technology Research and Assessment:

Balitbangda, DRD and the PTC are the three institutions at the provincial level that deal with research activities. As described earlier, the main duties of the three agencies are: (i) Balitbangda: to coordinate R&D activities conducted in the province, (ii) DRD: to formulate R&D policies and priorities, and (iii) PTC: to attain more effective and integrated activities for the assessment of promising agricultural technologies. Thus, the functions and roles of the three institutions complement each other.

Being the structural institution with the main duty to coordinate R&D activities at the province level, Balitbangda has to be involved in the PTC. In all provinces where Balitbangda exists, the head of Balitbangda is a key PTC member. Given its role in funding and implementing research using provincial funds, the involvement of Balitbangda in the PTC was expected to provide the opportunity for possible links between AIATs' activities and province-funded research programs. In reality, however, this depends on the commitment and vision of provincial administrations to provide budget for Balitbangda to conduct these

activities, and on the ability of AIAT to convince their provincial stakeholders about the importance of its activities. The latter is often dependent on how proactive the head of AIAT is to develop a close personal relationship with the provincial administration, and not just on the quality and potential impact of the proposed activities.

Being the institution expected to formulate R&D policies and strategies at the province level, DRD has maintained close relationships with Balitbangda. Given its strategic function, DRD needs to be involved in PTC activities and be represented by its head or the head of agricultural division. The addition of a DRD representative in the PTC membership should improve coordination between the two institutions. DRD is charged with the task of designing R&D policies, priorities and strategies, and the PTC can serve as a forum to help them facilitate this task for agricultural technology R&D. The fact that PTC membership comes from provincial Dinases also means that DRD will be able to obtain the perspectives of Dinases, especially because DRD members consist of individual researchers which do not necessarily include Dinases. In summary, the previous descriptions of tasks and functions of the PTC, Balitbangda and DRD show that the PTC is the most appropriate institution to deal with the coordination of research and assessment activities of agricultural technology in the province. In order to fulfil this efficiently and effectively, the following measures are suggested.

Review the membership of the PTC: The issues with the membership are related to the size and representation of key stakeholders. Some PTCs may have more members than they require. To facilitate easier communication and more efficient coordination processes, the number of members may have to be adjusted by defining the key stakeholders (Iqbal, 2007) needed in the PTC. Agencies which have become less relevant should be removed and newly-emerging key organisations, such as Extension Coordination Agency and Extension Commission should be added. Given the present nature of coordination between the provincial and district governments due to implementation of regional decentralisation, representative(s) from District government may need to be included in the membership.

Identify and enable a more active role for the PTC Technical Team: In all provinces, the absence of the heads of institutions in the PTC meeting was a common

concern. While members from provincial institutions can understand the busy schedule of the Head of Dinases, those from AIAT and universities tend to interpret this as a lack of commitment, interest, and seriousness on the part of Dinases for agricultural technology assessment activities. In reality, however, it is difficult to expect Heads of Dinases to attend all PTC meetings. It is not a matter of their lack of commitment, but having to prioritise the allocation of their time to a busy schedule. The ability of AIAT to find the right timing for the meeting is important. Usually, Heads of Dinases will not attend when it coincides with other meetings which are perceived to be of greater provincial significance, such as attending meetings with the provincial legislative assembly or meetings with the governor. These meetings are given higher priority because the Heads themselves must attend.

For the purpose of increasing the performance of the PTC, it is safer to assume that not all Heads of Dinases are able to attend the PTC meeting and to look for alternatives. In this regard, one possible alternative is to identify and enable a more-active role for the PTC Technical Team, which so far has not been functioning. Some measures related to this approach may include: (1) meetings of the Technical Team prior to each PTC meeting, (2) regular briefings from the Technical Teams for the heads of their organisations (and/or the representative on the PTC), and (3) consultation between AIAT and the member(s) of the Team in a less formal way, preferably involving field visits to research and assessment sites involving only the team members with skills/experience related to the particular technologies being assessed. With this approach, the PTC should still be effective and produce strategic decisions despite the absence of the Heads of Dinases.

Ensure budget support and official approval for participation of the appropriate Dinas offices: As discussed earlier, one of the main reasons for the absence (or the reduced frequency) of PTC meetings is the overall lack of funding for the AIATs. As a result they do not allocate funds for the PTC meeting in the proposed budget because they have to allocate the funds for other research and assessment activities. Given the importance of the PTC meeting, one measure that should be taken is for ICATAD to ensure that the budget for PTC activities is included in the proposed budget each year.

Another source of funds that should be explored is the provincial budget. If functioning effectively, the PTC can

provide the provincial administration with the best available advice on how to improve the productivity and profitability of agriculture. While the provincial administration cannot provide direct financial support to the AIATs, it could provide partial financial support for the functioning of the PTC. Indeed if the funding for the PTC were to be provided by both the AIAT and the provincial administration, there would be a sense of ownership and a vested interest from both parties to see that the PTC functioned effectively. Experiences with nationally initiated programs have shown that provincial and district governments can (and are willing on occasions) to provide financial support to AIAT activities.

Regularly renew/review the role and mandate of the PTC: Renewal and/or review of the key decrees and regulations that establish the role and mandate of the PTC will help improve the performance of the PTC as members will always be aware of the objectives of the PTC. This especially includes (i) the Governor's Decree for the establishment of the PTC and (ii) Ministry of Agriculture Regulation No. 03/2005 concerning the Guidelines for Preparation and Application of Agricultural Technology. During the assessment, some ex-officio members recently appointed to the commission did not know the mission of the PTC as they had never seen these key documents. Where there have been frequent changes in the provincial administration, renewal/review of these key documents will be useful for those who have just been appointed to become the head of member institutions, especially provincial Dinases. This may also avoid Dinases assuming that the PTC is an AIAT-owned institution and that their participation is limited to just giving suggestions to improve AIAT activities. Annual renewal of the Governor's Decree will also provide an opportunity for revising the makeup of the membership, should that be necessary and even revising the PTC mission and duties to reflect the changing environment. For example, with the establishment of Extension Coordination Agency³ and Extension Commission, the mission and duties of the PTCs may have to be revised. In the PTCs that were

³ In accordance with Law No. 16/2006 regarding Extension System, at the province level Extension Coordination Agencies came into being in 2007-2009. In the same or following years, provincial Extension Commission was then established.

assessed, some members were still included long after they should have been replaced.

Document recommendations of each PTC meeting and disseminate to all key stakeholders: As mentioned earlier, the absence of the heads of Dinases and participation of different staff in the different PTC meetings were common issues in all four provinces. To reduce the impact of these on the performance of the PTC, it is recommended that: (i) after each PTC meeting, the main conclusions, recommendations and actions to be taken by individual members are sent to each member, (ii) prior to conducting the meeting, the agenda for the meeting as well as the minutes and main conclusions/recommendations of the previous meeting are sent to every member. While this creates extra work for the PTC secretariat it is essential that recommendations and conclusions of the PTC are documented and reviewed by the members. Since the provincial administration frequently experiences changes of key staff, the documented minutes, conclusions and recommendations are necessary to make them aware of what has been discussed, who has been participating, and what to do next.

Encourage pro-active engagement of AIAT with key PTC stakeholders: The AIATs need to actively increase their profile with the provincial institutions and administration. In simple terms, the provincial institutions and administration need to be convinced of the importance of having the AIAT in their province if the relationship between them is to be strengthened. The provincial institutions and AIAT are partners in implementing assessment and dissemination activities. As policy makers the Dinases need to communicate with researchers at AIATs and clearly articulate provincial development objectives and priorities (Annor-Frempong, 2008). The Dinases are also “next users” of the technology recommendations that result from the assessment activities. Strong linkages between AIATs and Dinases are essential if assessment and dissemination are to be effective. Demonstration of the effectiveness of AIAT assessment activities could facilitate financial and non-financial (collaborative research, in-kind materials, and supporting programs) support from the provincial administration. The PTC is the ideal forum to build a stronger relationship between AIAT and the provincial institutions.

Build the capacity of AIATs to enable effective knowledge exchange: Enabling effective knowledge

exchange via targeted extension materials and the context within which they are used is essential for the linkage between assessment and dissemination to work well. Extension materials (such as leaflets and brochures) constitute the translation of assessment outputs into easy-to-understand information for extension workers and farmers. No researchers want to have their assessment results end only in proceedings and journals or even in the form of “recommended packages.” Good quality extension materials are scarce and badly needed in both provincial and district level Dinases. One member of the Agriculture Dinas in Southeast Sulawesi described being asked by many farmers for a leaflet that he had shown in an extension forum but could not give it to them because it was the only one he had. He relied on the central institutes for provision of those kinds of leaflets. Enabling effective knowledge exchange via targeted extension materials and the context within which they are used is a role in which the AIATs have comparative advantages which will build on and strengthen the relationships in the PTC.

Monitor the effectiveness of the PTC in bringing about better delivery of impact: The PTC is expected to be a forum of coordination among key provincial stakeholders in prioritising agricultural R&D needs and for discussing the outcomes of agricultural technology assessments carried out by AIATs. This coordination role is considered effective if assessment and dissemination activities at AIATs align more with provincial program and priorities. However, this might not be enough. Better coordination of assessment and dissemination might need to be seen in the field. In other word, there is a need for the PTC to demonstrate that it is able to bring about better delivery of impacts from assessment for smallholder farmers and/or agribusiness, at least through one significant case in certain period of time. This will enable the PTC or PTC Technical Team members to go out into the field, in addition to having regular meetings. Monitoring such effectiveness of the PTC can be done internally by the PTC itself, or by some agencies in the provincial administration.

CONCLUSIONS

The study has sought to better understand the status and roles of research-coordinating institutions at the province level, with a focus on (1) the performance of the PTC, and (2) issues affecting, and ways of improving, its performance. In summary, the findings of the study are as follows:

- Seen from the effectiveness, relevance, and financial viability, the PTCs have shown poor performance. PTC meetings are not held regularly and often are not as effective as they need to be. Despite being appropriate institution to coordinate agricultural technology research and assessment activities, they were dormant in almost all provinces surveyed.
- PTCs have not been able to fulfil their mandate because of problems about: (1) membership, (2) perception and understanding of the PTC and of its missions and goals, (3) financial sources, (4) the nature of AIAT activities in recent years, and (5) the nature of coordination between provincial and district government due to the implementation of regional decentralisation, and (6) timing of the PTC meeting.
- As a result of this study, the following measures for improvement of PTC functioning are suggested: (1) improve the representativeness of stakeholders in the PTC membership (including representative(s) from district government), (2) identify and enable a more active role for the PTC Technical Team, (3) ensure budget support and official approval for participation of the appropriate Dinas offices, (4) renew the Governor's decree for the existence of the PTC and regularly review the role and mandate of the PTC, (5) document recommendations of each PTC meeting and disseminate to all key stakeholders, (6) improve the AIATs' service to, and reputation among, all relevant PTC stakeholders, (7) build the capacity of AIATs to enable effective knowledge exchange and (8) monitor the effectiveness of the PTC in bringing about better delivery of impact. The AIATs need to be encouraged to assess the merits of these measures for PTC improvement as they will directly or indirectly lead to the better functioning of the PTC and hence better targeting of AIAT research.

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