Linking Livestock Research and Farmer Practices: Comparative Study of Technology Transfer, Participatory Learning and Action Model in Eastern Indonesia

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ABSTRACT

The transfer of technology (ToT) model has been used in Indonesian Agricultural Research for Development (RfD) projects as a strategy to communicate innovations into wide implementation. However, there is a growing concern over the effectiveness of ToT model as communication strategy of agricultural innovations for farmers practice change and livelihood improvement. This paper aims to compare and analyze two different approaches and processes in agricultural RfD projects, their consequent outcomes and impacts, the project’s externalities and lessons learnt from the two projects. A study was conducted from 2009 to 2010 towards two RfD projects in West and East Nusa Tenggara provinces using case study methodology from constructivist perspective. The two projects were: the integrated cattle management (Project 1) and the integrated maize-cattle management (Project 2). Data were analyzed using thematic and comparative descriptive methods. The participatory approach was implemented differently in the two projects, which substantially affected each project’s achievements and impacts. The Project 1 resulted in domination of elite farmer group members and researchers in the project processes. Project 2 with more active stakeholder engagement in the project processes provided more ownership and commitment over the processes leading to more suitable outputs and self-motivated practice change. This self-motivated change provided higher possibility for more sustainable impacts on farmer’s livelihood. Meanwhile, the Project 1 revealed more project externalities such as resistance from other stakeholders and farmers’ hesitance to spread information about the innovation because of their inactive participation during the project processes. Lessons can be learnt from these two projects including a necessity to move towards a truly participatory approach, empowerment through participatory learning and action, and building ownership by participatory processes.

Key Words: Participatory Communication, Transfer of Technology, Action Research, Farmer Livelihood

INTRODUCTION

The approach to agricultural development in Indonesia has shifted during the last 50 years. In 1970-1980s, the development paradigm by modernization was extensively promoted by the superpower countries (Preston 1996), that also brought various assistance schemes for Indonesia. In the area of agricultural research for development, this era was indicated by the widely-used of transfer of technology (ToT) model for communicating agricultural technologies as the vehicle of modernization concept (van de Fliert 2008). In the ToT model, technologies are developed by scientists in the research centers to be handed over to extension to pass on to farmers (Chambers & Pretty 1993).
This nature of this model was apparent in the Indonesian Agricultural RfD milieu by domination of the national research centre in developing technologies.

However, despite numerous RfD projects that have been launched and finished, there is a growing concern on the effectiveness of ToT model to facilitate farmers’ practice change and improve farmer’s livelihood. A working report (ACIAR 2008), reveals that in many cases, the new innovations introduced during RfD projects are often neglected soon after the project finished. Meanwhile, other stakeholders like the Local Government Development Planning Agency and the Department of Agriculture and Livestock both in provincial and district level strongly suggested RfD projects need to be more accommodating to the local demands and needs in the province. This indicates that a significant improvement in the nature of RfD projects is essential if it is to deliver positive impacts on farmers’ livelihoods. This paper aims to compare and analyze two different approaches and processes in agricultural RfD projects, their achievements and lessons learnt.

MATERIAL AND METHODS

A comparative case study was conducted of two projects in East Lombok and Kupang District. Those two projects were “Integrated Management for Bali Cattle in Lombok” and “Integrated maize-cattle farming system in Kupang”, respectively. For the purpose of writing in this paper, those projects will be called Project 1 and 2, respectively. Case study research (Yin 2003) was chosen as methodology because a project in itself is a complex social phenomenon that involves farmers’ lives and interaction between stakeholders. This particular research methodology helps investigators understand complex social phenomena and to retain the holistic and meaningful characteristics of real-life events (Burns 2000). Those two projects were selected as cases because they had distinctive approach and methodology with one topic, improving farmers’ livelihood through innovation intervention.

The study was divided into two parts. The first part focused on the project implementation while the second phase assessed the impact of the project after those two projects finished nearly at the same time at the end of 2009.

As a qualitative study, this research relied on several methods for data collection including document analysis, direct observation, in-depth interview, and focus group discussion (Yin 2003, Marshall & Rossman 2006). Focus group discussion was carried out for farmers’ groups in Oebola, Kupang, and Sembalun, East Lombok. Meanwhile, in-depth interviews were conducted with 39 respondents including project stakeholders such as farmers, field extension workers, staff from Provincial and District Department of Agriculture and Livestock, NGO and staffs from Assessment Institute for Agricultural Technology - West Nusa Tenggara (AIAT - WNT). All data were transcribed, coded and filed using Nvivo software. Data were examined, categorized and analyzed thematically to address the inquiries by following procedures from Yin (2003) in order to achieve objectives in this study, data were analyzed using comparative descriptive method.

RESULTS AND DISCUSSION

Varying implementation of participatory approach

Although both projects claimed that they followed the participatory approach for project implementation, this study found varying implementation at operational level. The
variation was clear from design stage towards implementation processes that also portrayed two different types in implementing participatory approach. Participatory approach in Project 1 was translated as élite domination, while in Project 2 it was implemented as egalitarian participation.

The integrated management for Bali cattle project

_Elite domination in the project processes_

Operationalization of participatory approach at Project 1 shows that engagement and involvement of élite members of the project partner group was used to influence practice change of the other group members. The project leader underlined that this project was started by approaching distinguished and influential farmers, a group leader and some élite members who were generally better-off, to obtain basic understanding of the site by and to explore the interest of these people and the rest of farmers. From discussion with these distinguished members, the project then assessed what improvement could be done through available technology. The assessment was supported by participatory rural appraisal (PRA) that focused on natural resource identification.

By following the project activities in further stage, the varying level of understanding and implementation of participatory approach within project team was more obvious. Before deciding any activities in the group, the project leader almost always asked farmers’ opinion and provided opportunity to modify it and decide their preference. Unfortunately, farmers that were involved in this decision making process were limited to the group leader and core members. One of the élite members preferred that only the project team and the core members planned and designed the activities because he doubted the members’ ability to follow the modified practices. He preferred the élite members to try the new practices and bear all its consequences whether it would fail or success. Because if any member was asked to try the new practice and then failed, he/she could discourage others to have a try. He underline that discouragement from farmer to farmer can be very strong and influential as most farmers and community in Sembalun have family bonds to each other that they would listen to their family more than to the outsider.

The project relied heavily on these élite members for two very likely reasons. The first reason was because this project was only for one year, while it was expected to spread the practice change and establish guru group that other farmers can learn from. One year a very short time to facilitate practice change particularly if the administration procedure does not support the project operation. Administration procedures within Indonesian Agency for Agricultural Research and Development (IAARD) rule that project funds are regulated on one-year administrative calendar based from January to December. It can only be accessed after agreement from the house of representative which usually happens in March/April and the budget has to be finished by the end on December. The project leader admitted that this mechanism hampered project activities as many activities had to follow the farmers’ calendar that do not match the administrative calendar. Therefore, it seemed that the project attempted to achieve its objectives in the very limited time by working closely with élite group members who were keen to provide assistance to support project demonstration activities.

Another reason for the Project to work from the élite group member was because of the challenge to engage and gain trust in new community like in Sembalun. A farmer said that farmers in Sembalun basically are easy followers for new practices providing that the
results and benefits are tangible. However, farmers would challenge the practice change with no apparent proof, and distrust the outsider. Given the project circumstances with short duration and limited resources, working closely with the elite group member that provide support can be an effective strategy to prove the practice change result. The majority of these elite members are highly respected in the community, and respected people in village usually have great influence on farmers’ behavior and practice. Project I utilized this influence to encourage other group members to take up the introduced innovation.

The elite group domination was very clear in the selection of demonstrator farmers. The selection process was mandated to the group leader. The project field staff and other elite farmers defended selection based on farmers’ eagerness and affordability to try the changed practice.

There are 40 people as core members in Horsela group, we can say these 40 people are better-off, this one owns land, that one owns cattle, so easy for us to try. That is the privilege from this group, we have a place if the project would like to try something either it is in cattle, poultry or land.

Researchers’ domination in decision making processes

Implementation of participatory approach in this project was understood as researchers’ legacy to direct the projects’ direction and agenda. Often, in the group meeting between partner farmers with the project team, usually held during evening to discuss the next activities, a researcher directed and told participants what need to be done the next morning and how farmers needed to arrange requirements for such activities. For every activity that would be carried out, one of the senior team repetitively sought agreement from the group leader before turning to others. Later in separate interview he explained that it was one of the strategies in this project to make people move doing changed practice. The group leader is very charismatic and respected. Although he is younger than many members, he has capability to mobilize the group and assist projects to provide requirements for technology demonstration.

The meeting between project team and partner farmers usually discussed technical and procedures of implementing the introduced innovation. There was very little opportunity for discussion and reasoning behind those activities. The group meeting itself was unique because it was designed to be attended only by group caretakers and demonstrator group depend on the topic discussed. For example, if the topic was about weaning calves, the meeting was only attended by demonstrator group for weaning calves. Practice of the discussed topic would be conducted the day after attended by demonstrator group and the group caretakers.

The implementation of participatory approach in this project was not reflected by all project team. Although majority of team member have had training on participatory approach, it seemed that they had different understanding and capability to put it into practice. In another interview, a farmer complained about the lack of opportunity to interact and discuss with project team. He reported that the project team only came to treat his sick animal then left. In another observation, it was recorded that in field monitoring of demonstration sites, the team member in charge almost barely spoke to farmers, instead focusing attention on plant growth. The other senior team member admitted that he could not afford time and resources to practice participatory approach because of other work demand from AIAT.
Project 1 reflects the characteristics of ToT model. In the ToT model, technologies are developed by scientists in the research centres to be handed over to extension to pass on to farmers (Chambers & Pretty 1993). The extension workers train farmers in a demonstration plot and visit them to ensure farmers are doing exactly what they have been told and also to help the trained farmers to spread the technologies to other farmers (Van der Eng 1996). Farmers are seen as either adopters or rejecters of technology (Scoones & Thompson 1993). This was similar to Project 1 where researchers brought innovations to be tested and implemented by farmers. The project involved elite members in the demonstration experiment with expectation that the elite members will spread the innovation implementation. According to Chambers & Jiggins (1987):

In ToT model, pressure groups and scientists determine research priorities, and then scientists design experiments, conduct these under controlled conditions on experiment stations, in laboratories and in green houses and hand over the results to commercial interests and extension organisations for adaptation and transfer to estates and to farmers. Agricultural scientists are conditioned by training and motivated pressure and incentives to work within and to support the ToT model. Four forces operate to maintain and reinforce it: Education and training; government and commercial funding; research methodology; and professional and personal rewards and incentives.

The integrated maize-cattle farming system project

Active participation of stakeholders in the project processes

Project 2 held on participatory approach as its philosophy and made efforts to implement it as participative as possible in every stage of project operation, from planning to implementation. In Project 2, community-based problem identification was the most important building block for building partner farmers’ participation and for further project development.

Finding farmers’ prominent problems and interest was somewhat tricky in the initial stage of the project. As shared by one the project team, in an initial meeting for community based problem identification, an invited researcher explained possible ways of improving farmer crops and cattle production from science perspective. Interestingly, most participants nodded but did not give further response; only the group leader seemed to be enthusiastic. This rang alarms for the project team suggesting that continuing group discussion would not be effective to find farmers’ problems and interest when only group leader was responding. The project team then altered the strategy and decided to approach and talk to farmers individually in less formal situations. This is the moment when many farmers turned up sharing their problems and interests very different to the one discussed in the group meeting. The project team then took these new findings to group discussion where most farmers now eagerly voiced their opinion.

Results from community-based problem identification were then taken into designing model workshop. The workshop was attended by various stakeholders such as partner farmers, field extension workers, NGO, and representative from Department of Agriculture. It aimed to socialize the project objectives to other stakeholders as well as to collaboratively design the project model for further operationalization. Discussion during workshop also covered implications for implementation of interventions; therefore they become aware of the consequences of changed practice. This two-day workshop was very impressive for a change in farmer attitude and behavior. On the first day farmer participants sat down silently and did not say a word at all in front of other stakeholders.
Reading this situation, the workshop facilitators then tried to create a less formal environment to encourage farmers to speak out. On the second day, farmer participants started speaking and pointed out their interests confidently. This confidence of speaking was continued throughout the project life and also shown during investigator interaction in the field. Active participation of all stakeholders in every stage of the project was revealed from all interviews as expressed below:

1. Mr OT (farmer): Before we start collaboration with the project, the project team provided information and did socialization on the project. There was a positive response from the group members because the achievement of project objective would return for farmers’ benefit. Then the project started by digging up our existing practice.

2. Mamak As (farmer): The first time Mr. group leader invited us to join the project activities, I refused because I thought people will only command and ask. Although I am only a farmer, I am already elderly that I do not like to be only commanded. But after seeing all activities were arranged in group, I became so interested especially because I am a single parent now.

3. Mikdont (Department of Agriculture): For this project, I have to say that the approach is good because we were involved from the start. Together with farmers, NGO, project team from AIAT, we planned, discussed all the stages from understanding the project concept, what is the processes, the schedule and even several definition, we discussed them with farmers. All of us really had chance to give feedback so we can get the project concept that really suitable for our condition here.

4. Toni Bengu (NGO): Indeed this is an outstanding project for us in CARE, collaborating researchers, related government Departments and farmers as final target. We were involved form the designing stage. We also provided our experience as NGO in approaching community as feedback in the designing stage. The we were also involved to visit the sites and for the project evaluation and further planning.

5. Ms. Maria (field extensionist): I saw the early planning stage begun from the farmers, agribusiness feasibility, agro-ecosystem suitability and available resources. Based on the available resources then the enterprise was decided.so the decision makers were farmers together with the project team, we along with farmers identified the problems, we facilitated and provided technical suggestions. When they found it was suitable for them, they accept it heartily.

   Active involvement of all stakeholders was not only expressed through words during interview but also has been proven through action to support achievement of project impact. The Provincial Department of Agriculture launched a program based on the project idea covering a lot wider scope. The CARE NGO also implement the project processes for its project in other areas.

Egalitarian position in decision making processes

   Involvement of all group members in this project was not only active but also equal for in decision making process. All participant farmers in this study agreed that there had to be collective group agreement before doing every activity under the project framework. This equal position for each member was clearly observed during all discussion with this group. Almost no farmer dominated the discussion. Even if a facilitator realized that he had spoken too much he would immediately invite other members to speak. This level of freedom to speak was not found in the previous two
Involvement of all stakeholders in Project 2 in all stages of decision making processes shows the features of participatory action and learning model in agricultural R&D projects. The participatory learning and action approach is the response towards calls for an approach of more farmers’ participation in agricultural research, extension and development (Chambers & Jiggins 1987, Farrington & Martin 1988, Thorbecke & Pluijim 1993, Van der Eng 1996, Sumberg et al. 2003). The pressure for stronger farmers’ participation also derived from a concern of continuing low productivity of agriculture across rain fed areas despite technologies had been transferred (Farrington & Martin 1988) and inability of the introduced technologies to solve farmers’ problem; instead farmers often modified and adjusted the technologies to suit their conditions (Maurya 1989, Rhoades 1989).

The implementation of participatory learning and action (PLA) model in Project 2 can be seen from the stakeholder active involvement and commitment in implementing the project activities. Further evidence can be seen from the sustainable and self-motivated practice change as a result of the active involvement in the project activities. Proponents of the participatory approach argue that the greater participation of farmers during research process, the greater practical value of the research will be (Chambers & Jiggins 1987, Van de Fliert & Braun 2002, Sumberg et al. 2003). It is farmers who can determine important problems to be solved in daily practice in comparison to professional researchers who majority living in urban areas, rarely practicing agriculture, and frequently approaching farmers problem from researchers perspective (Scoones & Thompson 1993). Therefore, providing space for farmers’ innovation and adaptation in the research process will not only generate technologies that will be suitable for farmers but also will enable wider and sustainable adjusted implementation (Chambers & Ghildyal 1985, Maurya 1989, Rhoades 1989). In agreement, other workers (Hoffman 2007), underlined that formal research and extension system solely will not be able to develop technologies for diverse individual needs, heterogeneous local agro-ecological conditions, various economic condition and multi-cultural preference. By working together, the limitation of researchers can be complimented by the strength of farmers’ knowledge and skills to achieve better results.

**Comparative project impacts**

Impact assessment in this study was focused on the impacts of the implementation of participatory approach to farmers’ livelihood of five assets: human, physical, economy, social and environment. Comparative summary of implementation of the participatory and impacts at each project are presented in Table 1.

**The integrated Bali cattle project**

As shown in Table 1, human impact in Project 1 was improved knowledge on cattle management but farmers were shy to share it to their colleagues. Farmers’ hesitance to share developed from their lack of confidence. This lack of confidence was attributed to the project design that did prepare as a change agent. Farmers were involved mainly as implementers of the demonstration and farmers had to follow instruction from the researchers. This was exacerbated by close supervision from the project field assistant that did not allow much improvement from farmers.
Table 1. Comparative of the integrated Bali cattle project in lombok and the integrated maize-Bali cattle project in Kupang

<table>
<thead>
<tr>
<th>Process</th>
<th>Project 1</th>
<th>Project 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Integrated management for Bali cattle in Lombok</td>
<td>Integrated maize-cattle farming system in Kupang</td>
</tr>
<tr>
<td>Period</td>
<td>2009</td>
<td>2008-2009</td>
</tr>
<tr>
<td>Objective</td>
<td>To demonstrate technology package of improved Bali cattle management;</td>
<td>To pilot on small scale the development model of technology and management</td>
</tr>
<tr>
<td></td>
<td>To improve farmers’ knowledge and skills in cattle management;</td>
<td>system for integrated maize-cattle that could motivate farmers in order to</td>
</tr>
<tr>
<td></td>
<td>To generate a model integrated Bali cattle - potato management.</td>
<td>improve their income and be able to own cattle</td>
</tr>
<tr>
<td>Innovation contents</td>
<td>Weaning management</td>
<td>Planting maize in rows</td>
</tr>
<tr>
<td></td>
<td>Composting for crops</td>
<td>Weed management</td>
</tr>
<tr>
<td></td>
<td>Forage preservation</td>
<td>Disease management</td>
</tr>
<tr>
<td></td>
<td>Health management</td>
<td>Cattle management</td>
</tr>
<tr>
<td>Impacts: Scope of practice</td>
<td>Composting practice spread widely (from 40 trainee to around 800 followers)</td>
<td>Wide spread practice change (from only seven trial farmers to more than</td>
</tr>
<tr>
<td>change</td>
<td>Increased awareness of animal health but still dependant on free project</td>
<td>half farmers in the village)</td>
</tr>
<tr>
<td></td>
<td>Practice of other technologies ceased after the completion of the project</td>
<td>Practice change spread to neighboring villages</td>
</tr>
<tr>
<td>Financial impact</td>
<td>Homemade compost has reduced costs of vegetable production</td>
<td>A dramatic increase in maize production has enabled farmers to buy</td>
</tr>
<tr>
<td></td>
<td>Reduced calf mortality rate from 80 to 20%</td>
<td>livestock. Some farmers now selling young corn with higher return.</td>
</tr>
<tr>
<td></td>
<td>Faster cattle growth rate</td>
<td></td>
</tr>
<tr>
<td>Human impact</td>
<td>Improved knowledge of cattle management but shy to share it</td>
<td>Improved knowledge of maize farming, confident and willing to share it</td>
</tr>
<tr>
<td></td>
<td>Changed behavior from wasting cattle manure to composting (value-adding)</td>
<td>Changed behavior from selling corn grain to marketing young (vegetable)</td>
</tr>
<tr>
<td></td>
<td>it</td>
<td>corn for a higher cash return</td>
</tr>
<tr>
<td></td>
<td>Wish to form smaller, more active and involved farmer groups</td>
<td>Improved self confidence</td>
</tr>
<tr>
<td>Social impact</td>
<td>Tethering cattle reduces the risk of crops destruction in the community</td>
<td>Farmers became teachers for other farmers</td>
</tr>
<tr>
<td></td>
<td>Creating jobs through compost production</td>
<td>Improved group dignity further motivated group work</td>
</tr>
</tbody>
</table>
As a result, farmers became passive and hesitated to share the information with their friends because they did not consider the activities belong to them. A farmer reported that he planted the potato border because the project assistant urged him to do so. This indicates that farmers did not consider the project activities as their own.

As for financial impacts, farmers gained knowledge for compost processing that led to financial benefits. Since most farmers are contract farmers for potatoes that require organic fertilizer, their compost was able to reduce significantly the production cost. One farmer can save up to one million rupiah per planting season. The other impressive result is the reduced calves’ mortality in the grazing land owed to animal health service and to the water tank developed by farmers with project support. This water tank provides water for grazing cattle in the hills and mountain especially during dry season and reduce accident rate where calves fight for water with adult cattle. Before the project started, calves mortality reached up to 80%. In contrast now farmers can harvest 80% of the calves.

Nonetheless, other demonstrations such as calf weaning, potato border and improved feeding management were not practiced anymore when this impact analysis study was conducted. The interviewee said that weaning calves put extra burden for the already busy farmers to cut and carry forages for the weaning while the improved feeding management by planting Gliricidia (gamal) and rice straw preservation were not preferred. On the other hand, planting two rows of maize as a potato border is considered to be disturbing for potato growth. Therefore, partner farmers returned into their previous practice with only one row in the field bund.

The innovation abandonment and unsustainable practice change in Project 1 were in line with the criticism over the ToT model. A number of studies (Chambers & Jiggins 1987; Farrington & Martin 1988; Roling & Van de Fliert 1998; Van de Fliert 2008) criticized the ToT model for its inability delivering livelihood improvement for “resource poor farmers”. According to these studies, ToT model most benefitted wealthier farmers whom extension workers preferred to work with. Better-off farmers had ability to fulfill the consequence of adopting recommended technologies that helped extension for an ease achievement of objectives. These phenomena were also found in Project 1 where researchers tended to work with better-off farmers who could provide land or livestock for innovation experiment and demonstration. Therefore, most benefits went to these elite group members.

Previous studies (Chambers & Pretty 1993; Van de Fliert; 2008) also found that working merely with better-off farmers contributed to the failure of ToT model in delivering impacts on “resource poor farmers” livelihood. This was because the extension massage did not fit in their circumstances, leading to a innovation abandonment. Similar result was found in Project 1 where the innovation was abandoned after the project finished.

Based on the implementation of participatory approach in Project 1, there are two contributing factors for this innovation abandonment. The first factor was that the project
tended to work with elite members and all information about innovation went to this group. Other group members did not receive information about the introduced innovation. Therefore, implementation of the innovation was limited and even abandoned after the project finished. The second factor was that the project provided inputs for innovation implementation without sufficient facilitation for farmers on how to access those inputs. As a result, when the project finished, even the elite farmers stopped practicing the innovation because of the limited access to inputs.

Furthermore, in the ToT model, farmers are commonly seen as a passive doers of the innovation trial. Ashby & Sperling (1995) underlined that where farmers are passively waiting to be told what to do, they can be reluctant to point out their ideas if they cut across the researchers’ point of view. As a result, what farmers apply in the trial may not represent what they are inteding to practice in their real farming. These features were also found in Project 1. The researcher closely supervised what farmers needed to do for demonstrationA farmer reported that he planted maize in the way suggested by project because he respected the project field staff who had worked so hard arranging the demonstration.

**The integrated maize-Bali cattle project**

Achievement of this project can be divided into physical and non-physical achievements as presented in Table 1. Physical achievements were represented by improved farm productivity and the scope of practice change. Through farmers’ practice change, the maize productivity increased impressively. “This year we got extraordinary harvest yield, I got 38 bags of maize, previously I never had more than ten bags, not enough to feed my family. I am very pleased with the results and I promise myself to continue this practice” (Liu). Another farmer was able to build a brick house next to his house of palm leaves. Other participants were able to purchase cattle or pigs. Formerly they only reared livestock for the owner which was very unbeneficial. Yet, because farmers with no livestock in the backyard are considered to be lazy, these peasant farmers had to take that share system.

This remarkable production increase has attracted many other farmers to practice the improved farm management. Majority of farmers in Oeboa now have followed the practice change from Kupang Project. This practice change has also reached other more distant villages. For example in Tumanau Village, the practice change has been implemented by 70 households in 68 ha land, while in Belu, another district close to Timor Leste border (12 hours driving from Kupang), the practice change was implemented through the Department of Agriculture program in 100 hectares land. To add, the NGO CARE duplicated the contents and methodology of this pilot project for farmer empowerment program in its working areas.

Meanwhile, non-physical achievement was shown by partner farmers’ self-development. In the first interaction between project team and partner farmers, it was obvious they were somewhat unconfident and hardly spoke out. In contrast, during this study, everybody was willing to speak and pointed out their idea, analysis and opinion. “…If there are new outsiders, we would like to challenge them to compete farming with us” (Nahor). This expression shows that they are confident with knowledge and experiences they obtained and mastered from this pilot project.
Unanticipated negative impacts of the project

**The integrated Bali cattle project**

There are several unanticipated negative impacts from Project 1 that were observed. The first is in regards to the group organizational development. Since the project relied heavily on the group leader, most support and extra in-puts from project for partner farmers went through this person or his trusted persons. This nurtured distrust between the group elite and the members because many members saw many benefits went to the group leader or his people. As a result many members were reluctant to practice the innovation/ technology because they did not get direct benefits from the project. Moreover, because the project did not provide information on how farmers could access the extra in-put after the project finished, partner farmers become dependent to the project AIAT to provide in-puts for the new innovation/technology. Many farmers did not produce compost anymore because they did not know how to get the decomposer, while many farmers were reluctant to seek vet service from the provider and waited for veterinary input from the project.

Another unanticipated negative impact was the unfriendly linkage between project team AIAT and other institutions such as field extension workers and dinas kecamatan. These institutions complained that the project did not involve them actively during the project. They felt embarrassed because the non-partner farmers often asked what have been happening in the project and they could not answer it properly because they had limited information. The field extension workers regretted their exclusion. If they had been involved, they could have spread the information about the new innovation/technology to their colleagues and farmers in other villages (PPL Batukliang).

The other missed opportunity for Project 1 was that partner farmers were not prepared as agents to spread the innovation/technology. A lot of trainings were only attended by few farmers and the nature of training was kind of lecturing. Practices in the field were very much dominated by researchers telling farmers what to do. As a consequence, partner farmers may not have understand fully the innovation and they felt unready to share the information with other farmers.

**The integrated maize-bali cattle project**

The study revealed only one significant unanticipated negative impact for Project 2, which was marketing. The project did not really touch marketing aspect and left the option to farmers. When the harvest yield of maize rocketed, farmers were not ready to market it neither able to store it properly. As a result, the return of this very impressive harvest yield was very poor. To some extent this has reduced their motivation to practice the innovation. Fortunately, some of them now already decided to sell the young corn as the market is more open and more beneficial.

**The perspectives and lessons learnt**

**Moving towards participatory approach**

Experience from Project 1 suggests that the transfer of technology model in technology assessment project often leads to unanticipated negative impacts. Putting farmers as passive participants and only handing over the technology by providing required inputs leads to farmers’ dependency on outsider agents to improve their problem
situations. They will become more passive because they are not involved in analyzing their situations and finding possible solutions. Hence, after the project finishes, they tend to return into their pre-project state.

Therefore, this paper supports a more active participation of stakeholders during the RfD projects’ processes. Participatory approach in Project 2 proved that it provides greater possibility for a project to be more effective in achieving project’s objectives and impacts on farmers’ livelihood.

**Empowerment through participatory learning and action**

Project 2 attempted to empower farmers through capacity building. The project was aware that adult learners like most partner farmers could not absorb, digest and practice too much information at once. Therefore, the project divided training themes into more attainable portions. This principle was also suggested by Stanfield (1997) in his adult learning principles. These include assisting adult to learn their interest, creating conducive learning environment, involving and valuing their experiences, encouraging them to plan, act, reflect and draw conclusions.

The result of farmers’ capacity building in Project 2 was shown from farmers’ self development and their developing skills to analyze their problem and find solutions. They have developed from very shy and unconfident farmers into confident ones. They also managed to find solution for their marketing problems by learning from their neighboring villagers and observe market demand around them. This also indicates that to build sense of ownership and to empower marginalized farmers through participatory approach require capacity from the project team to facilitate the processes.

**Building ownership over participatory processes**

Project 2 involved farmers and other key stakeholders in the whole processes including situation analysis, decision making, designing, implementation, and evaluation. Active involvement of stakeholders in the various stages of the project has contributed towards building a sense of ownership of the project. Creating ownership is very crucial, otherwise the program will always be perceived as “someone else’s” (Pretty 1995).

The sense of ownership has instigated stakeholders in Project 2 to implement the project results in their own program. The provincial department of agriculture launched a program based on the project results in other areas in East Nusa Tenggara as well as brought supporting programs in Oebola. Meanwhile, the NGO CARE adopted the model for their community development model in their working areas. This depicts that active involvement of stakeholders will contribute to escalate the impact of a collaborative project. Similar evidence is captured by Pretty (1995). He argued that local success based on community planning usually remains local and does not spread. Therefore, involvement of local government as policy maker and other NGOs is necessary to draw public attention to it, that can result in greater empowerment of the poor. This is in line with this project experience.

**CONCLUSION**

This study has found although these two agricultural RfD projects both claimed to use a participatory approach, yet the implementation was very different. Project 1 resulted in elite domination which resembles the characteristics of transfer-of-technology approach. Meanwhile, Project 2 implemented egalitarian participation with participatory
learning and action. Hampering factors for the implementation of participatory approach include the top down system in determining research agenda, the rigid administrative system and the researchers’ lack of understanding and internalization on participatory approach.

Another finding in this study is that the method of implementation of participatory approach contributes to the projects’ achievements and impacts. More active participation of stakeholders during the R&D project’s processes can help creating a sense of ownership and building capacity of stakeholders. Three lessons can be learnt from this study. There is a necessity to move towards more participatory approach in agricultural R&D. Participatory learning and action in agricultural R&D provides higher possibilities for stakeholders’ empowerment for innovation scaling out. A greater sense of ownership over the project activities can be built through participatory learning and action, and this provides greater possibilities more sustainable changes.

REFERENCES


Stanfield D. 1997. If you grab them by their learning process the rest will follow. Queensland (Australia): Department of Primary Industry, Toowoomba.


**DISCUSSION**

**Question**

Please tell us the methods you used in experiment 1 and experiment 2?

**Answer**

Experiment 1: the supervision by scientist was very intense and all the plans were made by the scientist, farmers just followed. Experiment 2: used participatory approach.