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CIVAS

FINAL TECHNICAL REPORT

OPTIMIZING RABIES CONTROL PROGRAM IN BALI: AN ECOHEALTH APPROACH

eco ZD

Bersama kita BEBASKAN BALI dari RABIES

International Livestock Research Institute
Livestock and Animal Health Services Office of Bali Province
Center for Indonesian Veterinary Analytical Studies

2013

Final Technical Report

for

"Optimizing Rabies Control Program in Bali: An Ecohealth Approach"

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Abstract

"Optimizing Rabies Control Program in Bali: An Ecohealth Approach"

The island of Bali was historically free from rabies. Since the first outbreak in late November 2008, the government has done many programs to control the disease, included mass-vaccination, selected and targeted elimination, public awareness, movement control and dog-bite case management. Rabies could not be seen as a single issue and involves many factors, including dog ecology, environment capacity, community behaviour and socio-cultural aspects which might influence the spread of rabies. With this comprehensive systems thinking, the Center for Indonesian Veterinary Analytical studies (CIVAS) with support from the International Livestock Research Institute (ILRI) and International Development Research Center (IDRC) conducted an ecohealth project in three city/districts in Bali (Denpasar City, Gianyar District, and Karangasem District) from early of 2011 until midyear 2013. The main goal of the project is to help the government in optimizing rabies control programs in Bali. The project was implemented by inserting six principles of the ecohealth approach. There were three kinds of activities: (1) desk study, (2) field study, and (3) community empowerment. These activities were conducted to achieve specific goals: 1) understand current developments of the rabies control program in Bali, its problem and policies implemented to support the control program, 2) provide updates on basic data related to dog population structure in Bali, dog behaviour, dog reproduction, and environmental factors supporting the dog population, 3) understand the relationship between Balinese social culture and dog rearing, 4) increase community knowledge especially elementary school students on rabies and dog-ownership responsibilities, and 5) encourage community participation and engagement in rabies control programs in Bali.

The general method used in this project were door to door or individual interview, in-depth interview, focus group discussion (FGD), observation, area and stakeholders identification and mapping, personal approach and interactive discussion, community engagement and participation. The strategy implemented was supported by field program tools and printed and audiovisual media. With the implementation of ecohealth principles, these project activities consist of (1) team capacity building, (2) network building initiative, (3) evolution approach, (4) encouraging knowledge and behavior change, innovative local initiatives and community participation, and (5) advocacy and policy engagement.

Key results of the project could be divided into three categories: (1) qualitative result, (2) quantitative result, and (3) community empowerment result. Outputs of this project include four categories: (1) technical data products, (2) innovative organizational system products, (3) result dissemination products, and (4) policy communication products. Outcomes from this project are categorized as: (1) improvement of community knowledge (community changes), (2) community attitudes and practice changes, (3) consideration of sustainability of efforts, (4)

better partnerships and network building between community and government, (5) improvement, adoption and adaptation of technology, (6) development of new research questions for next future activities or plan and (7) changes in behavior, capacities, actions and networks or relationships of researchers.

An ecohealth story from this project is how key results and scientific findings could be connected to real community situations and how communities, the government and other stakeholders have benefitted from this. This connection has led to positive outputs and outcomes with great consideration of program sustainability. Communities have changed their perspectives on how they can be involved in saving their lives from rabies threats, support the government through activities as village rabies cadres and consider continuous participation through the establishment of Village Rabies Working Groups (VRWG). Moreover the government has also changed their perspective and adopted the system by scaling-out village rabies cadres to all villages in Bali and encouraging the establishment of new VRWGs in the future.

Keywords: Bali, CIVAS, ecohealth, rabies, VRWG

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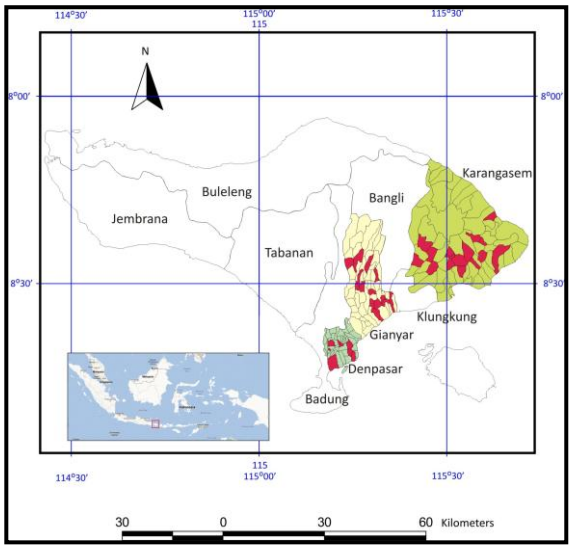
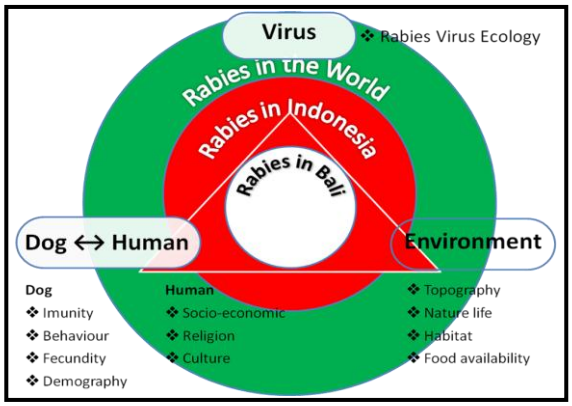
Table of Contents

1. Background and the Development of the Problem

1.1. Background and problem context development





Bali island was historically free-area from rabies. Since the rabies outbreak came on late November 2008, government have done many programs to control the disease, prevent its spread to other areas and implemented many efforts to get Bali free again from rabies. Rabies control program had been implemented included mass-vaccination, selected and targeted elimination, public awareness, movement control and dog-bite case management. CIVAS believes that rabies incidences in Bali and others area in Indonesia is closely related with the social-culture of the community, especially on the close relationship between community and dogs as an animal spreading rabies. In addition, until we proposed these activities, there's no current data on Bali dog's ecology that are accurate and scientifically-based. Basic data on animal transmitting rabies especially dog, natural Balinese dog behaviour, fecundity and reproduction capabilities, and other factors contributing for increasing dog population and rabies spreading included sociocultural aspect need to be known to optimize all control program. With many institutions already helping Bali with various programs, CIVAS would like to take part by bringing-up that issues using ecohealth approach. With the main purpose to help Bali government optimize rabies control programs, CIVAS will complete one other part of the puzzle.

This project conducted using the six principles of the ecohealth approach: (1) systems thinking; (2) trans-disciplinary research; (3) participation; (4) sustainability; (5) gender and social equity; (6) knowledge to action. The ecohealth approach perceives the social, political, economic, human health and environmental components as an integrated system instead of separate systems, with the assumption that the ecological function is interlinked with the socio-economic function. This approach fits well with the disease situation of Rabies in Bali which is a complex multi-dimensional and multi-factorial problem involving various socio-cultural of the community. Therefore, a trans-disciplinary approach and a wide range of stakeholders must be involved to solve the problems.

Rabies could not be seen as single issue and involves many factors. An ecosystem approach to health would be appropriate to address the challenges that arise on the Rabies control program effort by the government in particular and other stakeholders. An ecohealth approach consists of involving participation at the highest level of key stakeholders related to Rabies control effort and a combination of understanding the real situation with intervention for change. Therefore, the engagement conducted with the community is as an intervention/action research approach. The aim of this activity is to generate positive changes in behaviour on the bite cases managements, responsible dog ownership and community involvement in mass vaccination, public awareness by the cadre, dog registration, and other community involvement in rabies control programs lead by the government. The findings obtained from the research could be used to support and optimize ongoing and future rabies control programs.

1.2. Objectives

Based on problem-context describe above, CIVAS developed several research question that were implemented by three kinds of activities: desk study, field study and community empowerment. Field studies done were desk study, dog demography study, dog behaviour study, dog fecundity study and social-culture and its relation with dog-human relationship study. Community empowerment activities included community empowerment for rabies control program in two pilot villages and public awareness about rabies and dog-ownership responsibility for elementary school. With the goal to help the government optimize rabies control programs in Bali, CIVAS project activities were conducted to achieve specific goal: 1) understanding current developments of rabies control program in Bali, its problem and policy implemented to support control program, 2) provide updates on basic data related with dog population structure in Bali, dog behaviour, dog reproduction, and environmental factors supporting the dog population, 3) understanding the relationship between social-culture of Balinese and dog rearing, 4) increase community knowledge especially elementary students on rabies and dog-ownership responsibility, and 5) encouraging community participation and engagement in rabies control program in Bali. To achieve the expected goals and outcomes, the six principles of ecohealth had been implemented since project planning, implemented through developed methods and strategies, and adapted in conjunction with challenges and problems found in the field.

2. Project Activities

The project could be divided into three activities: (1) desk study, (2) field study, and (3) community empowerment. Desk study was implemented by analyzing the strength and weakness of implemented rabies control programs and deliver recommendations for optimizing future programs. Field studies included: (1) dog demography and population estimates study, (2) dog fecundity study, (3) dog behavior study and (4) relationship between social-culture and community behavior in rearing dog. The community empowerment program was implemented through two field activities: (1) public awareness for elementary school communities, and (2) community empowerment program in two pilot villages. Field project activities generally consist of:

(1) team capacity building, (2) network building initiative, (3) evolution approach, (4) encouraging knowledge and behavior change, innovative local initiatives and community participation, and (5) advocacy and policy engagement.

Generally, the five activities in this project are connected to each other. Project activities described were already planned from the start, but it also evolved and developed during project implementation. With the design of this project, which combines desk studies to better understand implemented, ongoing and future rabies control programs, field studies and community empowerment - this project has collaborated the scientific systems thinking of dog ecology (demography, behavior, and fecundity) and its relations to be determinants for rabies spread, understanding the reality of socio-culture behavior in community, its risks and also benefits to support rabies control program, and how the scientific result can be delivered and better understand the community and government. To achieve the goals of this project with the consideration to be sustainable and maintain community participation, project activities mentioned above were implemented by inserting the six ecohealth principles so that it became an ecohealth project.

Capacity building was conducted for researchers, field team and boundary partners without distinguishing gender, education, occupational background or social economic status. Field data had collected were assess and analyzed to better understand what is known, how it relates with other findings or knowledge and community behaviour, and what communities or stakeholders can understand and use of the findings, and also actively participate in supporting the rabies control program. By exploring our systems thinking on doing these activities, the approach system was implemented very flexible by evolution process following the progress and barriers found in the field. To be strict with our goals, project activities were also done by encouraging knowledge and behaviour changes of our boundary and supporting partners. Local initiatives were also encouraged in communities willing to be active and where these activities were thought to be sustainable. To make the project outputs become real benefit for the community, government and other stakeholders the engagement of the policy and advocacy process was implemented. In this way, recommendations for future programs have been disseminated and delivered for continuous follow-up.

2.1. Team - Capacity Building

In this project, field team and expert team consist of personnel with various backgrounds, both in their specialty and gender. Team capacity building was conducted by intensive discussion to understand the goals, standard operational procedure, outcomes to be achieved, concept for community approach, the importance of team work, and also better understanding of the ecohealth concept in the program. The concept of community approach covers how to approach the community as a personal

human-being, or a part of community structure, but also how to understand and deal with administrative aspects and local ways of the community.

Challenges faced this activity were different opinions in the team, the need for an open mind to think the problem comprehensively because of different educational backgrounds and the need to adapt to local community behaviour. These problems were overcome by intensive discussion within in the team. Face-to-face discussion for team evaluation was done one a month and weekly progress reports were provided. In addition, direct discussions were conducted when there's new problem in the field. With an open mind and honest attitude, each personal in the team were asked to share every problem they found and give input and opinion to find alternative solution together. Based on the problem found, but still also based on our context problem and goals developed in this project, knowledge evolved into new action and strategy to continue all activities.

2.2. Network Building Initiative

Other activities in this project were network building initiative among rabies cadres, between rabies cadres and banjar or village leader, and between community and livestock or health officer in the district or sub-district. This initiative was developed based on their need to exchange information and happened automatically in this project. For example, the involvement of banjar and village leaders in the rabies cadre election process; administrative support from the Education, Youth and Sport Services Office in public awareness activities at elementary school level; involvement of livestock service officers in rabies cadres evaluation meetings; and networking initiative among rabies cadres, traditional leader and banjar or village leader to accommodate public awareness in banjar communities and ensure the passage of the quick response system for dog-bite cases.

Barriers experienced in this activity were the quite long process needed to establish networking and openness of communication between community and livestock service institution. During the project, networks developed smoothly because CIVAS always follow all administrative procedure in banjar until province level. With this

process, CIVAS had been accepted very well in the area and build communication between community and livestock services through our program and field activities. But, the future challenge is how to make this networking and communication sustainable. The problem identified was there's bad perception from the community regarding government officers because they always come when they need something and fail to understand community problems. In the other hand, livestock officers could not spend much time for communities because if other duties and there is no obligation insert in that activity. But, if both could look back, they need each other. Based on our monitoring and evaluation discussion, community would like more attention from livestock service institution. Since cadre activities provide very actual data at grass-root level that are very useful for the government, we proposed the government to be the next facilitators for the community. By doing meetings and evaluations regularly in their visit to villages, they could get updated data on dog population and progress of cadre activities in the villages. In addition, as communities hope, the livestock services office was proposed to actively give public awareness, monitoring, and engage with community to discuss, explore and build next rabies programs based on community capabilities. It could be vaccination program for puppies, dog chaining program, etc., where the community can help and act in the program.

2.3. Evolution Approach

Evolution process was the other activity in this project. It is key to transforming ideas and understanding problems found in the field to become new ideas and strategy to achieve outputs defined. Evolution process happened naturally and mostly internally in the team and program. The team need to be very flexible and open minded to find alternative solution, adopt new ideas that come from new situations, but still straight to the first plan to achieve project outputs.

Barriers experienced in this activity were limited time or duration of the project. For example, we had a problem to fit the schedule of demography study with community because of different schedule of banjar or village's traditional ceremony. In this case we must be ready to re-schedule all the time based on the latest update of ceremony in each banjar, because some activities in banjar can be held suddenly or out of Balinese ceremony calendar. CIVAS team also must be ready to do field activities without any local companion. Other example was for social-culture study. When we did focus group discussion (FGD) at banjar level, we conducted discussion together among all representative of three groups of community member, which were traditional leader, government officers, and general representative of community. We experienced that people could not express their opinion in the discussion among big group where government officer or traditional leader present, therefore we evolved with new strategy by conducting next discussion based on each group of community.

2.4. Encouraging Innovative Local Initiatives and Participation

Other activities that are very important in this project were encouraging innovative local initiatives and community participation in rabies control program in banjar or village. This was evident in community empowerment programs especially in the development of rabies cadres in two pilot villages. CIVAS as facilitators always tried to put rabies cadres as a subject for doing all programs that already planned and agreed together. In each discussion when new problems found in the field, cadres were placed as the subject and encouraged to find applicable alternative solutions. Through interactive discussion, rabies cadres were encouraged to explore their ideas to solve problems found based on current conditions and feasibility to implement.

For example, how to provide an incentive for cadres for their operational cost. In addition, how to continue community participation after project ended and CIVAS as facilitator is leaving. Innovative idea came-up from the Head of Sibetan Village to form working-group for rabies cadres and made this a legal structure as part of the village task-force. Another example was when communities in banjar have a problems with reporting the dynamic of pet-ownerships using registration cards developed by CIVAS. To solve this problem, cadres were actively doing door-to-door dog registration and teach them how to fill the card or to report their changes of pet-ownerships. Because not all community understand how to fill the card, cadres in Melinggih Kelod Village worked together with women community and encouraged its structure called “Dasa Wisma” to be involved in the program without any incentive. Each member of Dasa Wisma was appointed to observe and collect information about dynamic of pet-ownerships from five *angkul-angkul* (one *angkul-angkul* could consist of several Balinese households that still have blood relation as a family). This data was reported to rabies cadres during monthly women meeting. Cadres who already had good recording in one banjar also shared their record-book and approach-technique or experiences to other cadres in other banjar.

Barriers experienced in this activity was that successful encouragement of the community had to go through intensive discussion between CIVAS as facilitator and cadres who represent the community. It was mandatory to be open minded and sensitive to community problems. Cadres must be encouraged to be honest of their problems and their thoughts or opinions. Throughout the project, CIVAS had teach and trained the head of working-groups and its members to do self-assessment to evaluate their activities, at least 2-4 times in a year. The future challenges is to continue this monitoring-evaluation program regularly, both independently by working-groups and with the mentoring from livestock services office.

2.5. Advocacy and Policy Engagement

Advocacy and engagement with government to encourage implementation of future policies were conducted by sharing all project results and recommendations through dissemination meetings with many stakeholders. Two issue briefs were developed to accommodate all information and were distributed to all leaders in banjar or village level, human and animal technical services institutions in in Bali and other stakeholders such as universities, NGOs and government in national level. The evidence of success of this activity was the government using our data of demography study and dog population estimate as one of data references to estimate dog population and preparing logistic vaccination. Livestock services at provincial level also encouraged district level to use linear-mathematic model from dog fecundity study as a simple tool to estimate additional dog population based on the presence of fertile female. In addition, the head of livestock services offices at provincial level adopted our ideas to engage with community by developing two rabies cadres in each village in Bali. They were also very open and willing to work together with 30 infected villages by conducting the technical training-workshop for rabies working-groups preparation facilitated by CIVAS and ILRI.

Barriers experienced in this activity were the difficulties to make rabies working-groups in two pilot villages a legal task-force under livestock services office decree. Even though this structure was already legalized by head of village, it is very important to bring livestock services institution to give legalization and official support. This condition became challenges for future continuous program from government. The official support for legalization could be decree or other official legal form that acknowledge the presence or activities of rabies working-groups and it becomes under the supervision of livestock services office. Other challenges were how to advocate the government to activate government developed rabies cadres to encourage their communities in each village to adopt and develop rabies working-groups in each village.

3. Methodology

The method used in desk study was literature review and in-depth interview with stakeholders. For the dog ecology study, the methods utilized were door to door or individual interview, focus group discussion (FGD), observation, area identification and mapping, and community engagement and participation. For community development program in pilot villages, we used intensive approach consisting of four steps, which were (1) village characteristic identification, mapping (transect walk) and stakeholder mapping, (2) information transfer, problem mapping and its alternative solution based on condition of community, (3) capacity building and agenda working agreement, and (4) monitoring, evaluation and program development or adjustment. For public awareness activities at elementary school level, the methods used were class presentation, interactive discussion, scenario activity and the use of audiovisual media. Medias and tools used in project activities were structured questionnaires, FGD's guideline, form or observation card, and many public awareness media including pictures, case-record, poster, leaflet, sticker, flipchart, film and song (Annex 1). Monitoring and evaluation of the public awareness program for elementary schools used pre and post-tests, whereas for monitoring and evaluation of community empowerment program in two pilot villages, Outcome Mapping was implemented (Annex 2).

Ecohealth approach had been consider from the first step of project design. Besides other technical programs for the success of rabies control, such as mass vaccination, elimination of rabid dog and traffic control program, dog ecology and human role or community participation aspects were also considered in this project because of its importance. In every kind of field study or community empowerment program, ecohealth principles had been inserted. Those principles were found very useful to support the implementation of methodology, strategies, exploring problem-shoot alternative solutions and data or result analysis for achieving project goal.For every field study or community empowerment activity, field teams were selected based on the education background needed, whether veterinary medicine or social education background.

On dog demography study, photographic capture-recapture was using to collect information about free-roaming dogs found along main roads of banjar and village at certain times, in the morning and afternoon. On dog behaviour study, observation areas were defined based on dog habitat or places commonly used as food source area, for examples: garbage collecting unit, temple, beach, traditional market and school. In this study we also observed the number of interaction/contact between dog and other dogs, and between dog and human, on a daily time basis. Methods and strategies were developed based on our pre-survey visit, literature review and development of systems thinking to better understand rabies which is very dependent on dogs as a source of infection and movement.

The concerns below were the focus of the approach implemented as a construction of systems thinking to achieve all expected outputs:

- When is the suitable time for dog observation?
- Why were main roads in villages or selected?
- Why were food sources mapped and observed?
- Why are the number, times and contact location an important aspect for observation?

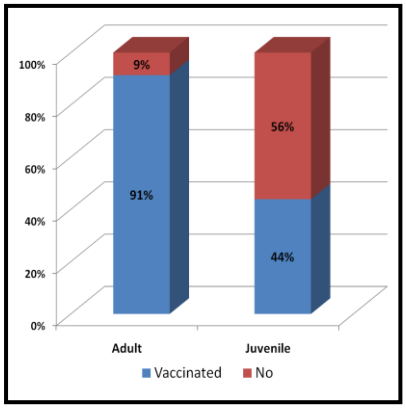
By consider all of the above, risk factors related with dog behaviour and other conditions could be better understood and be used to help find optional strategy to minimize its risks.

Gender equity was the aspect we considered for defining strategy to achieve our goals. On dog fecundity study and social culture-study, role of man and women were equal in relation with rearing dogs. This result could be concluded through in-depth interview with both genders as respondents. In social-culture study to collect information for community perception, both genders were present as representatives from three group of community (traditional leader, government officer, and banjar community) in focus group discussion. They represented different social status, occupation and educational background. With those strategies, results of thestudy could be described broadly on real condition in daily living of Balinese community in relation with their dogs. On community empowerment program, gender equity approach was successfully used as a strategy to encourage community participation in the program, encouraging development of local innovative sustainable ideas. Better community understanding of ecohealth was achieved through the public awareness programs which try to connect field results with possible of community participation based on their capabilities. For example, communities were informed of the result of the dog fecundity study which showed the estimated number of puppies born in a year that could act as potential hosts for rabies infection. Through this the community was encouraged to participate in dog registration program, new puppies recording and actively searching for rabies vaccination services from livestock services office.

During the project, there was no significant changing in the method. Adjustment on time of implementation, approach and trouble-shooting had been done and described as an evolutional process both in the team and in development of program. It was implemented as new strategies to solve problems found in the field. Progress markers or indicators developed were used to monitor and evaluate whether or not boundary partners were involved in project activities. This achievement could be assessed objectively. For example, assessment on participation of community on dog registration program or quick response for dog-bite case and evaluation on the increase of student knowledge after public awareness program had been implemented.

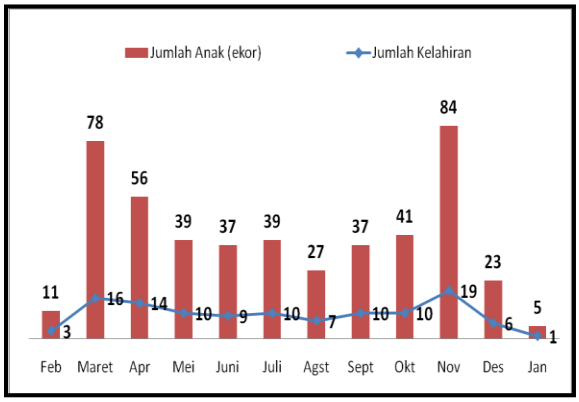
3. Key Results

Key result of rabies project in Bali could be divided into three categories: (1) qualitative result, (2) quantitative result, and (3) community empowerment result.



Based on the results, project recommendations were delivered to support optimization of rabies control program in Bali. Recommendations from this project were: (1) optimization of rabies vaccination program, (2) implementation of dog population control program, (3) increasing public awareness for community, (4) and increasing community engagement and participation. Qualitative result from demography study showed high numbers of vaccination coverage on adult and owned dog population (more than 70%), on the other hand coverage was low in puppies and the free-roaming dog population (20-50%). Dog fecundity results showed the presence of two peaks of birth in a year that increases the dog population 1.7-3 times. Rabies information for community was not equally accepted because of many barriers in the fields, included human resources of field officers, and area topography. Moreover, our results showed that community engagement could be encouraged and naturally instigated through the right approaches. These approaches should be made based on community needs, potency, culture and behaviour in each specific area.

Barriers gave through to the emergence of new ideas or initiatives from both internal teams in CIVAS and communities. Ideas or local initiatives gave new outputs that exceeded our expectations. It was described clearly on Outcome Mapping table that showed several targets achieved Love to See levels, whereas our target planned was Like to See level. Striking facts found in this project were the creation of innovative ideas which in the end supported and improved the quality of project outputs:



4.1. Positive Striking Facts

4.1.1. The openness and support of traditional leader and local government at Banjar and village level

The openness and support from traditional leaders and local governments at banjar and village level has given the CIVAS team good opportunities to successfully carry out all activities. The way on how CIVAS team followed all administrative procedure, be involved in local culture behavior and appreciating traditional and local wisdom had opened their minds and accept our good will. During the project, there was information transfer on rabies and government related programs from the team to stakeholders in the banjar and villages.

On the community empowerment program, the openness and support from traditional leader and local government at banjar and village level was also very prominent. They appointed and encouraged people in banjar or village level to volunteer as rabies cadres and ran the program together for the community. Traditional leaders supported the government by inserting rabies programs in banjar local law (perarem) with the topic on how community will get punishment when they don't take care of their dog and cause dog-bite case, especially when it's rabid and caused the death on human. Dog owners must be responsible for expenses of medication or traditional cremation (*ngaben*). Until the project ended, there's one banjar that started to included dog responsible ownership as a major subject. It was about restrictions on number of dog ownership.

The openness of local leaders and emergence of local ideas became challenges for CIVAS to be more open and explore new ideas and way of thinking in further developing the program. This condition requires focused concern so CIVAS as the facilitator will not mislead the community the wrong way. We had interactive discussion with rabies cadres, local leader or community to correct any misunderstanding or misconception. All decisions must be based on community agreement to get specific purpose and minimize any side effect or risk as much as. For example, it must be very clear explained to the community that the intention of releasing *perarem* related to dog ownership was to encourage people to be a good dog owner, so that community obedience to *perarem* was not only because of economic impact to the costs of medicine or traditional ceremony. A correct understanding must be informed to community that government efforts are to make Bali free from rabies, not free from dogs. Other examples was the negative impact related to dog ownership restriction where there was possibility that community could throw away puppies that had been born because they have too many animals. This condition could happen because Balinese people are not allowed to kill dogs. Further impact would be increasing the number of unowned free-roaming dogs (stray dogs). Local government must be prepared with solutions, for example: excess number of dogs could be given to other families with no dogs, report to the local government when have too many puppies and preparation of local government for facilitating its condition, development of monitoring and evaluation mechanism to ensure that extra dogs in household would not be thrown. This ideas inserted in *perarem* was in line with government program on population control, and it could be linked with other stakeholder included private sector or NGOs who are interested in animal welfare.

4.1.2. Willingness of community to actively participate

Community willingness to actively participate was showed both in field studies and community empowerment program. This condition was found to be related with their curiosity about rabies and its relationship with their dogs at risk for rabies. Although their daily lives are very close with their dogs, they admit that didn't understand clearly about their dog's behaviour in details because of lack of attention and rearing culture by free-roaming dogs. Community participation for example during observation processes in the dog fecundity study, the openness of community in focus group discussion about community perception in socio-culture study and willingness of community to learn more and participate as rabies cadres and supporting CIVAS field activities in this project. This enthusiasm encouraged CIVAS to further explore ideas facilitate the community's needs based on their capabilities.

4.1.3. The openness of livestock service office of Bali Province to adopt rabies cadres system at village level for all villages in Bali

The openness of Livestock service office of Bali Province to adopt rabies cadres system at village level for all villages in Bali was extra output of this project, even though the approach process, structure and legalization of these cadres were totally different with the ones in our two pilot villages. Those cadres were developed based on livestock office decree at provincial level and being paid monthly. Through our project results related with dog ecology, social culture study and community empowerment program, the government has seen the importance of sharing all related information related to the community and how that technical information had been accepted by communities in village level. Based on this reason and the need of presence of local community as a bridge between government and villagers for transferring information and program on rabies included developing of quick response system, livestock service office in province level had adopted the development of rabies cadres at village level. This plan was already being thought in past time but must be postponed because of many barriers, included funds. By seeing CIVAS's approach and result, the government got new hope for realization of community support. Technically, head of livestock service office of Bali province has release a decree to appoint two local people from each village in Bali to be rabies cadres. They are tasked with doing quick response in dog-bite case, public awareness and facilitators to inform all government program related rabies. With provincial decree, cadres had technical mentoring and logistic support 5 USD per month. With the adoption of rabies cadres at village level, livestock services office of Bali province and CIVAS had same hope to encourage development of new rabies working-groups in each village.

As a facilitator, CIVAS can't push ourselves, the government or community to continue the program that was established in this project. However, we have seen many positive outcomes that give good impact for stakeholders to support rabies control program. With consideration for sustainability, learning the real situation how pilot village and its rabies working group become model for real community participation on rabies control program, we had explored many possibilities to continue this effort by comprehensive system of thinking. The positive response from government by adopting village cadres system in all villages in Bali became a challenges and also opportunity that encourage CIVAS initiatives to scale up the rabies working group system. By scaling up this system, government or livestock services offices can guide the program for rabies working group to be in line with government program. In this way also, the networking between government, community and traditional leader can be guided to be sustainable by the leading of the government. Even so, CIVAS cannot expect the establishment of new village rabies working groups to be apparent in the near future. With many barriers in the government system working and with the end-up of project supported by ILRI-IDRC, the initial initiative was working together with livestock service office to prepare human resource and the system of establishment for next potential village rabies working group. This initiative was then implemented by conducting "Technical Training-Workshop on Development of Village Rabies Working Group for 30 Infected Village in Bali Province" on 15-18 July 2013. Output of this training workshop was document-draft of development of village rabies working groups for each village and well trained local communities as human resources for running its working groups. Moreover, CIVAS had done smooth hand-over for continuing this program to the government. With consideration of the many benefits obtained by the government through this program, we encouraged livestock service office to insert this program in their annual program and it's budgeting, including consideration of its legalization to become a government taskforce. In short brief, CIVAS's initiative becomes real action by knowing and learning in very details all possibilities and barriers we had to pass and continue to move and change the challenges into good opportunities.

4.2. Negative Striking Facts

4.2.1. End of fund support from CIVAS-ILRI (end of project)

End of fund support from ILRI-IDRC was reality that gave direct impact to CIVAS and our boundary partners. Rabies cadres and local leader found that they still need more mentoring and guidance that used to be done by CIVAS. They felt the importance of sustainability of interactive discussion on how to explore alternative solutions and encourage communities to participate as CIVAS had done. For CIVAS as organization, even though it had been known, we identified many outputs and recommendations that could lead towards next potential activities to support Bali in achieving freedom from

rabies. For livestock service offices, they felt advantages from our results and expect to have more support for realizing next activities based on our recommendations.

Conditions described above encouraged community, local government, livestock service office and CIVAS to think and give new initiatives. This evolution from negative striking facts became positive impacts were based on same expectations of all stakeholders to make the program sustainable. Local leaders released Head of Village Decree for legalizing village rabies working groups. With this formal structure, it could do fund-raising to support logistics and the program. There were also good solutions performed by local leader to ensure and continue facilitating community participation for securing their village from rabies. With the legalization, head of banjar and village level were also encouraged to spare small money from banjar/village cash to support rabies working groups. This initiative received good appreciation from many stakeholder including livestock service offices from provincial level. Rabies cadres were appointed as a model by provincial level to present their activities to other districts in Bali. Furthermore, head of livestock service offices in provincial level adopted rabies cadres working-system and then release the decree for appointing two local people from each village in Bali as rabies cadres as described before. CIVAS also continued to explore and prepare concept notes for next potential activities to support the sustainability of the program.

For sustainability of program in community, they had tried to implemented micro credit as one solution for fund raising. Small funds had been collected from budget allocation for net purchasing at banjar and village level. This fund was saved in banjar/village level to be run as loan funds for cadres. Interest of loans was used as operational fund support for cadre's logistic such as gasoline. With the formal structure of village rabies working groups in village structure, fund raising also could be done by proposing some activities related with rabies to district or provincial local government. Others initiatives came from CIVAS to encourage the community to explore their potential fund support. We helped them sell local products, rabies souvenir (hat and t-shirt) and rabies poster from rabies poster competition for banjar level on several venues related with livestock service office meeting and our project result dissemination.

4.2.2. Refusing or disagreement from livestock services offices at district and provincial level as legal structure under their decree

Refusing or disagreement from livestock services offices at district and provincial level to take the rabies working group as legal structures under their decree was negative striking facts that weaken the spirits of rabies cadres in pilot village. However, communities could accept the reason from them, as this working group was only done in two pilot villages and was not originally government program from district or province.

This condition encouraged CIVAS as facilitator to keep cadres and local leader spirits who already gave all support and expect a good response from government. This has been one of the reasons why we did the formal ceremony or official announcement for two village rabies working groups. On that event, we invited livestock services office from subdistrict, district and provincial level, human health services office from district level, and local government form banjar, village and subdistrict level. This official announcement encouraged Head of Livestock Services Offices of Gianyar district, one of our pilot village, to release official supporting letter for the establishment of rabies working group, even though they could not release the decree.

Even though the provincial level could not give their support by decree for rabies working groups, its working groups had been appreciated by government through bringing them up as a model for others districts in Bali and several guests from livestock services office outside Bali. Head of provincial livestock and animal health services office invited Head of Sibetan village and Head of Rabies Working Groups of Melinggih Kelod village to share their experiences by presenting their activities and its process in meetings and public awareness programs in nine districts/city in Bali. Moreover, pilot villages with their rabies working groups became an area for comparative study of rabies control program by other livestock services office from outside Bali, such as DKI Jakarta Province and South Sulawesi.

The legalization process for village rabies working groups is continuously advocated by CIVAS is promoted to all stakeholders. With the openness of livestock services office to duplicate village rabies cadres, CIVAS encouraged them to continue and promote rabies working groups to be duplicated in each village. With the fund support from ILRI-IDRC, technical training workshop for preparing duplication of working group had been conducted and became a part of provincial livestock service program. Through this inserted program, we advocate and encouraged the government for the realization of next news village rabies working groups and its sustainability on mentoring, evaluation and development to support the goal of Bali free from rabies.

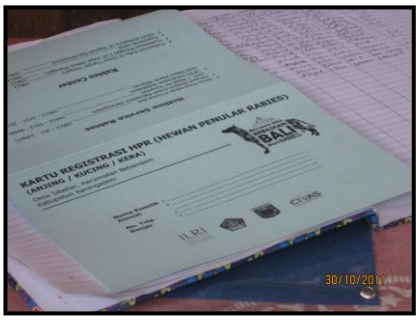
5. Project Outputs

Outputs of this project include four categories: (1) technical data products, (2) innovative organizational system products, (3) result dissemination products, and (4) policy communication products. In each output both in presentation and printed format, acknowledgement to ILRI-IDRC was always delivered, especially for ILRI as a first project-partner in the project contract. Until the end of project, CIVAS never use project fund from ILRI-IDRC to support other activities. However, several outputs were used by the government especially for public awareness program related to rabies control and also to support and optimize government program. For example: CIE team / KIE Team (Communication, Information and Education) of provincial livestock service office of Bali distributed rabies leaflet produced by CIVAS on mass vaccination program round-3, project results and its recommendations dissemination included population estimate calculation formula based on female fecundity on Infectious Disease Animal Workshop for all district in Bali, sent of representatives of village rabies working groups from two pilot village for experiences sharing to other districts in Bali, and appointment of two pilot village became areas for comparative study for others livestock service office outside Bali related with rabies control program based on community participation.

5.1. Technical data products

Technical data products as project outputs included data results from filed studies were analyzed into scientifically-based information and could be used as references or practical guidelines in the field activities. Technical data mentioned could be read in details in each field study reports. Major results that would be very important to use were human-dog ratio population estimate data based on area categories (urban, sub-urban, rural), peak–time estimation data for puppies born in a year, additional population estimate formula based on number of female fertile dogs in an area, and vaccination coverage data on adult and puppies. All information mentioned could be used to estimate dog population in one area as a baseline to define target of vaccination coverage. In addition, it could be used for consideration on defining appropriate mass vaccination time.

5.2. Innovative organizational system products



Innovative organizational system products as project outputs were ideas that emerged from both the CIVAS team and our boundary partners. For example, how communities actively used Dog Registration Card and Log Book for supporting dog registration program and encouraging community to be involved through regular social meeting or by door to door. Other example was rabies poster competition for banjar level created by CIVAS to increase community awareness and understanding to rabies and dog-ownership responsibilities issues. The posters have been used for public

awareness media. CIVAS also worked together with provincial livestock services to do auction for rabies poster with the purpose for fund raising. Poster competition prizes and money collected from poster auction was used as funds for rabies working groups. Rabies cadres initiated micro credit system for fund management, and used its interest for operational and logistic support. Other innovative organizational system was the involvement of women group at banjar level called Dasa Wisma to help dog registration program. With no incentive they helped women rabies cadres to observe dog ownerships based on traditional household and reported the result to rabies cadres in their monthly regular meeting. For supporting public awareness program and encouraging the improvement of understanding and behaviour changes of community, rabies cadres from Sibetan villages also created a traditional Balinesse song describing rabies and dog owner responsibilities called “Kidung/Wirama Pupuh Sinom Rabies”.

5.3. Dissemination result products

Results of this project were delivered regularly as progress reports to livestock services office in three districts where we did the projects and provincial level. Moreover, project results were also published as poster articles or oral presentation in national or international scientific meeting (Annex 3). At the end of the project, before delivered as final report, overall project results and its recommendations were disseminated at three events of result dissemination meeting with the form as executive summary of the projects. Three events mentioned were: (1) results dissemination for representatives of livestock services office from all districts/city in Bali through Workshop on Strategic Animal Infectious Disease (Annex 4), (2) results dissemination for internal team of three district involved in the project and provincial ICS team (Incident Control System) (Annex 5), and (3) workshop on results dissemination for all livestock services office from all districts/city in Bali and other stakeholders (Annex 6). The results and recommendations were also shared in printed media (Veterinary magazine – InfoVet) and CIVAS’s website.

5.4. Policy communication products

Policy communication products developed in this project were two issue briefs promoting two main issues for optimizing government programs to free Bali form rabies. The two issues brief were about the importance of studies and understanding better on dog ecology, and the importance of community empowerment through community engagement and development of rabies cadres and it structure which is village rabies working group (Annex 7).

During the project, CIVAS team and its experts or consultants team, also other stakeholders were involved in the process of achieving goals. Stakeholders consisted of boundary partners (rabies cadres, local leaders at banjar and village level) and supporting partners (technical institutions on livestock, human health, and education services, local governments at subdistrict, district and province level). The role given was technical assistants to support field activities, supporting administrative procedures

and technical inputs on scientific data analysis and trouble shooting. Until the end of the project, all outputs were achieved, both in field study and community empowerment program. In addition, during the process, development of outputs happened. Even though our first output was only to increase community knowledge and awareness and ecourage them to participate in the government program, we obtained more than expected. Legalization of rabies working groups was the output that developed and evolved during the good progress of community engagement results. But the success story that we could tell was the establishment networking system among communities and between communities and local leaders and livestock service institutions through initiation of work mechanism on village rabies working group to support government program. In addition, potential sustainability of these activities was done to ensure both logistic aspects and continuous mentoring and evaluation from government. Nonetheless, if we had next opportunity to do the same project, we would like to increase the quality of evaluation and monitoring process for boundary partners, and involve technical services office directly in mentoring and evaluation based on indicators developed together with them. On that way, they will have more responsibility for this program, can insert the program in their annual budget plan, and could drive into legalization of structure became part of the official government program or task by decree or others formalization scheme.

The key to our success in achieving outputs in field studies was consistent on the method implementation and flexibilities on the approach and development of strategies in the field. Even though we had many technical barriers, consistency to the methodologies and SOP that were established based on epidemiology basic analysis must be implemented to ensure that our studies could be scientifically responsible. Flexibilities on the approach to explore appropriate strategies must be considered to support field activities. Key success to achieve our outputs on community empowerment program was consistency on the basic process to engage with community, consistent with messages and program we would share and develop, and also flexibilities on the approach and development of strategies in the field. Those could be done by always being open minded and sensitive to the issues or changes in the field and follow up with appropriate reactions or response through intensive analysis and discussion based on specific and real condition in community.

6. Project's Development Outcomes

Outcomes from this project was categorized as: (1) improvement of community knowledge (community changes), (2) community attitudes and practice changes, (3) consideration of sustainability of efforts, (4) better partnerships and network building between community and government, (5) improvement, adoption and adaptation of technology, (6) development of new research questions for next future activities or plan, (7) changes in behavior, capacities, actions and networks or relationships of researchers.

These outcomes contributed changes in community, government (especially in provincial and district livestock services offices) and researchers.

There was improvement of system management and systems thinking of government to build a good direct link with community and obtained their participation. This was proven by the appreciation of provincial livestock services offices to our cadres from pilot villages to become a spoke person to share the village rabies working groups to others districts in Bali. They also adopted rabies cadres system at village level where representatives of local people in the village do public awareness and quick response on dog bite-cases. Dog registration program that we've done in pilot villages had been not adopted yet because the limitation of resources in government's cadres system. But moreover, government was very enthusiastic to scale-up the program and encouraged every village to develope the Village Rabies Working Group as established in the pilot village even though it was not easy because it need cooperation with village or banjar leaders and traditional leader which have a different and specific system. In that way, they cooperated with CIVAS supported by ILRI-IDRC to prepare technically for 30 villages infected by rabies as priorities. The project outcomes also show how community changes their perspective on the context of helping themself and saving their live from rabies threats. If both of these changes in the government side and community could be maintain, further positive potential impact can be obtained for supporting government program to get Bali free from rabies, such as decreasing cases both in human and animal, increasing community knowledge and practices on better management of dogs rearing, and also increasing community health in general. For future time, the system established and its structure can be used by them to prevent and control other diseases. On researcher's side, the project outcomes had gave positive changes especially on how we had different point of view on ecohealth research and combining the scientific basis findings with the real problem context in community who will use and get benefit from our outputs or project results. It lead us to pass the process on, translate our knowledge and scientific basis findings into sustainable actions that and give beneficial impact to the community and other stakeholders related in the program.

6.1. Improvement of community knowledge (knowledge change)

Improvement of community knowledge as outcomes from this project not only included rabies and its control program or dog-owner responsibility, but also knowledge which developed based on quantitative and qualitative data results from this project. Through public awareness program and intensive discussion, the data was shared as practical information to community through rabies cadre activities, to local leader at banjar and village level, and to livestock and animal health services office. Understanding of those results was real outcomes that we

could see in the community. Changing condition from "don't know" to "know" and better understanding of other aspects both cultural and environmental related to the risk of rabies were proofs we found. For examples, community could understand better that their dogs could give birth to many puppies twice a years, they understand that free-roaming their dogs especially without vaccination could increase contact with other dogs with suspect of rabies, and they also know that bad management of garbage in their environment could support the presence of stray dogs. Based on our evaluation through questionnaires, all community as respondents had good level of knowledge on rabies and responsible dog-ownership. In school community, all students as respondents for pre and post test showed a good level of knowledge after we did the public awareness program. This meant that information transferred was well accepted by students, and directly improved their knowledge. In this program we could not assess the increase of knowledge, because public awareness program for 107 elementary schools was only done once.

6.2. Community attitude and practice change

Community attitude and practice change exhibited and shared many times by our boundary partners were: (1) community willingness and participation in rabies mass vaccination program and (2) community enthusiasm to do quick response in dog-bite case management and its reporting to local leader and technical service institutions both in livestock and human health. Based on community evaluation through questionnaires, all respondents have vaccinated their dogs and mostly by following rabies mass vaccination program. Communities followed the first aid procedures for dog-bite case by washing the wound with soap in running water and reported the case to the local leader or rabies cadres. Practice change on dog rearing could not be described clearly because based on monitoring and evaluation meetings with boundary partners, community realized the importance of leashing dog or keep them at home, but many barriers were found, such as economic aspect and dog behaviour changes. Even so, few people with higher economic income were willing to buy a leash. Moreover, communities are being informed and encouraged to try rearing their dogs at home or by leashing them starting from puppies.

6.3. Consideration of sustainability of efforts through innovative local ideas

Behaviour changes and knowledge changes had been driving communities to be more involved in programs that were agreed to be continued and implemented together among boundary partners. With their willingness to continue program, innovative local ideas came to ensure the sustainability without depending on outside donor support. Those local innovative ideas were initiative for formalization of village rabies working group as formal structure attached to the village structure, initiative for independent fund raising for village rabies working group (micro credit, sale for local product and rabies souvenir), activation of dog registration program through door-to-door survey and social-community meeting (man/women meeting, health post meeting and services), and inserting public awareness program about rabies through cadres activities with human health program on health village program.

6.4. Better partnership and network building between community and government especially with technical service institution

Relationship between community in pilot village and livestock and human health service office had been developed during rabies cadre development and next through monitoring and evaluation program meeting. We made a link on the capacity building activities and training. After the official announcement of village rabies working group, government saw positive activities and its result. The relationship became better and this was proven by request of provincial livestock service office to have representatives from the two pilot village rabies working group to share their experiences and activities to others districts in Bali and other guests from outside Bali.

Until the last evaluation and monitoring activities, intensity and quality of the relationships could not be measured very clearly. Based on our observation and monitoring, livestock services office already used data collected by cadres to support government program. For examples, government used dog registration data in banjar level to be used as baseline data to do mass vaccination program. Moreover, rabies cadres are also involved in the field as local assistant to do door to door rabies vaccination. Deeper relationship that CIVAS expected such as government engagement in rabies cadres on monitoring, evaluation and progress discussion in activities or rabies control program, has not yet appeared. It happened because even though government already realize how important engagement with community is and continue the program, they have some barriers related with programs already set-up in their institution. With limitations of

annual program and its budget, livestock services office program have to be adjusted if it wants to be implemented soon. But it was quite difficult, because programs and its budget must be proposed annually, then programs that had not been included before could not be implemented. CIVAS already discuss and tried to proposed the livestock services office with the purpose to include monitoring, mentoring, evaluation and legalization of villages rabies working group into their program in the future years of plan and budgeting of rabies control program.

6.5. Improvement, adoption and adaptation of technology

One of technology or strategy model that CIVAS created and being adopted by community is the development of dog registration program using dog registration card and log book at banjar (sub-village) level. Information collected on dog registration program is very important and its importance was understood by livestock service office. Even though it is not a new thing, but how the community actively updated data at banjar level was a wonderful movement. Organizational system that had been managed independently by community deserves high

appreciation from all stakeholders, especially from livestock service office since the results were very helpful for the government. The best lesson learnt is the adaptation

and effort to collect important and basic information so the dog registration card could be accepted in every banjar with the adjustment of implementation based on characteristic and capability of each banjar or village. With the problem on fund and logistic of dog registration card , community can still work to do dog registration program by regular data updating through door-to-door survey or cadres on their regular meeting or other social scheme of information transfer. Until the end of the project, CIVAS already discussed with provincial livestock service office about the government adopting and integrating the registration card model into vaccination cards already developed by government, but it could not be promised because it is related with budget. Moreover, they gave their appreciation to the work of rabies cadres and for sure will use all information in the card as basic information for government. With the duplication of cadres in all villages in Bali, technical information collected by rabies cadres in pilot villages will be shared as a model for other villages.

Second model or strategy that also adopted in this project was rabies cadres in village level and its structure by provincial livestock services office. Even though steps used by the government were different with what we did, the idea to bring local community as a subject to do the program was implemented, especially for public awareness and quick response to dog-bite case. Two people form each village are appointed as village rabies cadres in 752 village in Bali. Moreover, the government has admitted the positive impact of village rabies working groups and they also support the training on preparation of duplication village rabies working group in 30 infected villages of rabies by conducting technical training.

6.6. Development of new research questions for next future activities or plan

Based on project results and its recommendation, new research questions appear as an issue that must be answered. All new research questions were developed by exploring systems thinking of the results and condition we had knew in Bali that could support detail information and impact relations in the future on optimizing efforts for make Bali free from rabies. Potential research questions that could be developed into field studies and community empowerment activities are: (1) Can chemical contraception reduce dog population growth from reproduction capabilities?, (2) Can management of garbage collecting points at sub-village level reduce the presence of stray dogs or free-roaming dogs?, (3) Can community participation on dog registration program, dog-tagging program based on village level, and continuing vaccination services from livestock services office help reduce the risk of rabies incidences

significantly?, (4) Can engagement and participation of traditional village structures on providing temporary shelters for population control program through operational dog sterilization program and its support through development of appropriate traditional law on restrictions of dog-ownership help reduce additional owned and stray dog population significantly?, (5) Can the increased community knowledge on economic aspects and impact of rabies vaccination program and implementation of responsible dog-ownership increase community participation to support rabies control program to get Bali free from rabies?

6.7. Changes in behaviour, capacities, actions and networks or relationships of researchers

Outcomes from this project for CIVAS as researchers and organizing committee were the development on capacities in systems thinking, sensibility toward field problems and organization of strategies and actions. Based on field condition and local wisdom, we were to be trained and learn more how to implement appropriate strategies that still focus on output among the adjustment that must be concerned. We also had new experience on how to do monitoring and evaluation program using Outcome Mapping Method and report writing with program report format which is different from activities or study reports for past activities. Based on history, this project was the first project that came purely from CIVAS ideas, which is different from previous projects which were already set-up by fund donors. With this condition, we learned from the start how to prepare proposal and its program development based on our understanding and knowledge on this situation and ecohealth concept thinking. Through this project, we also learned how to communicate our result and its recommendation into policy implementation, which were done by development of issue briefs. This project also initiated good relationship and networking between CIVAS as organization or its personal members with international communities concerned with ecohealth. This good opportunity can be potential for CIVAS or its personal member to grow-up and get better carrier opportunities and initiating others activities that useful for community health and alleviating poverty as vision and mission of our organization.

7. Project's Ecohealth Story

The eco-health story of the project that CIVAS had implemented in Bali could be seen obviously from the beginning when activity was planned, applied, and finally reached the outputs and outcomes in which would result in positive impacts if this could be done continuously through monitoring and evaluation of the programs. CIVAS had chosen the eco-health approach as a technique that could be developed to help the

government control and eliminate rabies in Bali. According to the concepts of this program, CIVAS did not entirely cover the three aspects in balancing the ecosystem which were the environment, host, and disease agents. On the other hand, CIVAS had tried to take role in exploring the host and environment by including other aspects such as the culture and traditions of the locals.

Inter-discipline and gender equity was applied from the beginning of the plan until the implementation of the program on the field. The formation of expert team, CIVAS internal team, and field team, and also the selection of boundary partners were considered since the first time. The atmosphere of working as well as learning could be created through this activity. By learning the concept of the problems, obstructions, and the occurrence of several ideas and thoughts from the team and the local community as boundary partners, therefore the realization of those ideas and thoughts could be achieved. The local community as the cadres and the government particularly the *banjar* and village leaders as the boundary partners were the key factors for this program to reach success. Together with the livestock service as a supporting partner, CIVAS had succeeded to urge other supporting institutions which were also important such as health service, education, sport and youth service. Boundary partners who had been chosen by CIVAS were excellent and they had succeeded to urge the role and/or the participation of the local community. Due to the political situation in Indonesia, inter-disciplinary collaboration was not easy to be formed, because each discipline was separated by different institution. Through the selection of boundary partners in the local community and their leaders, their role became more effective because they could be involve directly and worked independently without any institutions related. Moreover, if they were equipped with adequate skill and knowledge, they would be able to control and prevent the rabies by themselves.

Generally during the process in this project, eco-health approaching technique could be the answer of all problems and obstructions. Although in this program, the study of the economy aspect of the local community had not been done specifically, but it was considered that the local community awareness and participation could be improved if they basically understood the economic value of the advantages and disadvantages in preventing and eradicating rabies. Socio-culture approaching technique in Bali was proved to raise the community active participation and support toward the eradication program of rabies. Beside the technical programs that had been implemented by the government such as vaccinations, selective and targeted elimination, animal traffic regulation, and dog-bite case management, the role of the local community in supporting the technical programs was needed to be more focus and intense. The accessibility of basic data related to the ecology of the dog that had been provided by CIVAS as a part of this program could be renewed in certain period by building a partnership with research institutions in Bali. Nevertheless, the local

community always needed to be advised continuously in order to get their active participation in this program. This would require more attention from the government as the community server, since the changing of custom in the local community could be happened anytime due to the influence of economy, social, and culture aspects.

The effort in motivating the local community had shown a good result. This eco-health approaching technique had been able to develop the local community's creativities independently to continue the program, by institutionalizing the activities of the cadres into a form of working-groups and initiating independent financial support. Nevertheless, further role of the government had become the key factor as the facilitator and situated the local community and their leaders as the boundary partners in order to free Bali from rabies. The changing of knowledge, behavior, and comprehension were the actual impacts that could be established as a success indicator of the government which needed to be evaluated and urged through initiating new programs continuously.

8. Overall assessment and Recommendations

This program was expected to contribute valuable benefits for the government as well as the community. The government and the local community themselves were expected to obtained the benefit of the program by getting involved directly, as well as qualitative and quantitative data collected, and other important information and references obtained.

Generally, the results and achievements of this program were equal to the expense, energy, and cost that had been allocated for this program. During the program, CIVAS had found many difficulties as well as the strategies on how to overcome those. This had become a valuable benefit for CIVAS, as well as the local livestock service, other institution, and the community, to spare, to continue and to develop the program. Through many lessons learned, this program was expected to be planned and implemented efficiently and effectively by involving various resources.

Various programs have contributed positive impacts for the local government such as: providing recent data related to the ecology of dog as the main rabies-carrier animal (HPR) in Bali; the estimation of dog population to increase the validity of the vaccination results; the comprehension of numerous supporting environment factors as well as physiological characteristic of Balinese dogs that could affect the increasing population of rabies-carrier animal (HPR); the comprehension of the dog behavior and the improvement of the awareness of the community toward rabies; the active participation of the local community in the rabies control and eradication program. Through this program, the local government could continue to adopt the system that CIVAS had managed, particularly programs related to empowerment of the community by forming rabies cadres and working-groups in village level. Through the recommendations given by CIVAS, the local government, the local authority, and the local leaders had been urged to do several local programs such as increasing the role of the villagers in managing the garbage disposal in order to minimize the population of stray dogs indirectly. But until the program ended, CIVAS had yet to evaluate it entirely. Internally, CIVAS had planned to communicate the result of the program in Bali in many chances whereas eco-health issue was raised to eliminate the zoonoses. The result of the program in Bali was an important example that could be spared as a form of pilot success story for CIVAS in eliminating the zoonoses. Results that were transformed into the media of communication to support the policy would also be presented to the government and other institution such as *Komnas Zoonosis* (Indonesia National Committee for Zoonoses) that has greater role in defeating zoonoses in Indonesia.

During the program, CIVAS cooperated only with ILRI-IDRC in the matter of financial support. This was an important contribution for CIVAS, particularly for the next programs in the future. In fact, the financial support from the local as well as international donor had become the potential prospect for the next program. The second important thing was the study of economy aspect of the local community, since it affected the process of eliminating the disease. By understanding the economic situation of the local community, the program could be implemented well. Other lesson that CIVAS had learned was to get involved with the technical service from the beginning of the program although this would take additional cost and time.

This program had given many positive and negative impacts that related to the partnership between CIVAS and ILRI-IDRC. Several positive effects which were well-implemented by ILRI-IDRC through this program were:

1. Flexibility in Time Related to the Budgeting and Field Program

One of the problems on the field was the different schedule between the program and the activity of the government and the local community. Therefore, several activities that had been scheduled before were postponed occasionally (e.g, the demographical study of the dog). Due to the changing situation in the community, several programs that had been budgeted before had to be rearranged in order to give more benefit for the community (e.g, when the first financial proposal had been approved to purchase dog-catcher net, it suddenly became the fund for the community programs). In this situation, ILRI-IDRC had shown excellent flexibility. Therefore, the main purpose of this program still could be fulfilled, even better than expected.

2. The Presence of ILR-IDRC Representative in Monitoring and Evaluating the Program Intensively

The presence of ILRI-IDRC to monitor and evaluate the program was intense directly and indirectly. Their presence to observe the field activity, to conduct a discussion with the education service, livestock service, village and *banjar* leaders as well as the local community, had given CIVAS more support in this program. The presence of their consultant team by developing method, analyzing the result, evaluating, and setting this program into a valuable input had helped CIVAS to support the field activity.

3. Responsive in Every Need of CIVAS

Though a little bit long due to the selective administration process, ILRI-IDRC was considered quick enough to respond every need of CIVAS, particularly in changing the schedule due to the condition on the field. ILRI-IDRC knew this situation very well because they kept monitoring the program intensively. For example, when CIVAS experienced difficulty in completing the socio-culture study related to the analysis of financial support, ILRI-IDRC then responded by sending one of their socio-culture consultants to assist.

From the first step of implementation, ILRI also provided technical support on dog ecology data analyzing through Dr. Katie Hampson and managerial systems thinking. On the progress of project and its publication, we were also supported by many ILRI's expert on reviewing our abstract for scientific meeting. By the time we translated our results to influence policies; we had technical support from Dr. Amanda Wyatt. We were also supported by Dr. Kevin Bardosh on social-culture study analysis, and Dr. Korapin Tohtubtiang and Dr. Raines Asse for monitoring evaluation process, ecohealth-uptake and writing of ecohealth report.

4. Providing Plenty Opportunities in Publication

During this program, ILRI-IDRC have given plenty opportunities for CIVAS to be involved in publishing the result locally and internationally. CIVAS also got the opportunity to consult the writing of the articles. One thing that had not been materialized was the continuous support from ILRI-IDRC to publish the scientific journal internationally. Although this could be considered that there was no specific financial

support for publishing the result in the international scientific journal, CIVAS still expected the support from ILRI-IDRC to publish an online-free international scientific journal altogether.

Several Inputs for ILRI-IDRC were:

1. Socialization of Outcome Mapping Method after the Program had Start and or During the Program

ILRI-IDRC team used an excellent evaluation program toward the result, because it did not only solve the problem, but also emphasize the process. Therefore, many benefits and lessons could be obtained. Nevertheless, this method would be better if it was socialized from the beginning of the program in order to be able directing the achievements that were expected from the boundary partners optimally.

2. Delay on Sending the Socio-Culture Consultant

From the beginning of the program, CIVAS used its own internal expert in socio-culture and not from ILRI-IDRC. But in the end of the program, ILRI offered its socio-culture expert to help analyzing the data. This was considered late, due to the administration process and the arrangement of the schedule. It would be better if the socio-culture expert from ILRI was sent from the beginning of the program.

3. Request Approval of Socialization Media from ILRI-IDRC in which was not Listed in the Agreement (CRA)

Since the beginning of publishing the socialization media, the content, the design, and the form of the publication, CIVAS had never requested the donor to get involve. It had become the CIVAS' privilege as the field coordinator. This was not also listed in the CRA between CIVAS and ILRI. But in the middle of the program, when CIVAS had published the socialization media based on the input from the local livestock service, all of a sudden ILRI issued a new regulation for a request approval of the media that had been published. In fact, this was not burdened, but it would be better if it was stated or listed in the CRA from the beginning.

4. Long Administration Process

In many conditions, ILRI-IDRC was considered flexible. Nevertheless, in the administration process or approval system that had been applied frequently took a long time. For example was the amendment CRA approval. Even though it had been informally approved through e-mail, but the process of legalizing the document of approval had taken a long time. This affected the reduction of the financial support. Although based on the CRA that the payment of the program had to be done 75% since the beginning of the program, and the rest 25% was paid after the final report had been submitted, but in the reality CIVAS had to cover the expense of the program up to 40% by itself. This was caused by the delay of the payment mechanism.

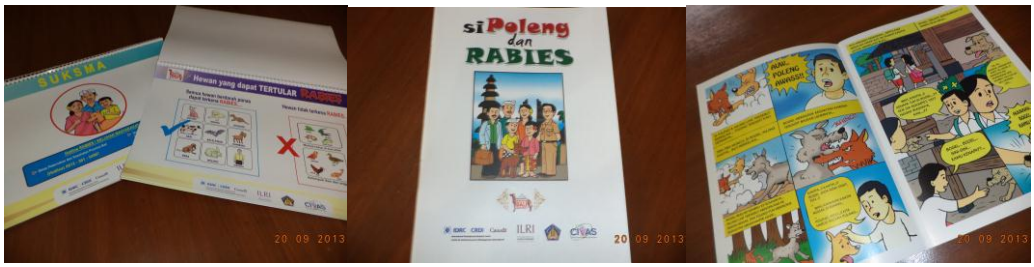
5. Delay of Data Sharing Agreement

Data sharing mechanism was a good offer from ILRI-IDRC in order to keep the data obtained from the program would not be used irresponsibly by other party which not involved directly to this program. But since the offer was proposed during and or after the program almost ended, the data sharing agreement was less expected. CIVAS, as an organization had agreed with this type of mechanism, because it provided many benefits and also protected the Intellectual Property Rights (IPR). Since the program involved the local livestock service as the local government institution, the process was not simple as it had been expected. By many political issues, this data sharing

agreement could not be continued because it had not been done since the proposal of the program was first submitted.

Annexes

Annex 1. Public Awareness Medias had been developed and used to support project activities



Annex 2. Outcome Journal for Outcome Mapping of Project Monitoring and Evaluation on Community Empowerment Program

Vision and Mission:

Vision:
To help rabies eradication in Bali through ecohealth approaches
Mission:
1. Provide data through transdiscipline studies to support the making of decisions for rabies eradication. 2. Improve public awareness and active participation in rabies eradication programs
Outcome challenge statement ***Boundary Partners*: Formal and Informal Leaders and Rabies Cadres**
Formal and Informal leaders understand the significance of rabies and support rabies eradication programs. Leaders also encourage local people to actively participate in rabies eradication programs. **Rabies cadres** understand the significance of rabies and how to prevent, control, and manage cases. Cadres give rabies education to the local community and increase their awareness. Cadres register the local dog population, report suspected dog bite cases and human cases to the local authority
Strategy Map
• Rabies cadre trainings, public awareness to school students and teachers • Development of good link and networking between community cadres with livestock and human health services offices • Co-develop public awareness media with local society • Intensive problem shout discussion and doing self assesment to find potential alternative solution based on community capacities • Encourage cadres to increase their awareness and being creative to solve their filed problem on running their program • Rabies cadres activities formalization • Encouraging for laternative independet fund raising for supporting rabies cadres activities

Progress Markers:

Boundary Partner	Progress Marker			Evaluate achievement; How well we achieved?
	Expect to See	Like to see	Love to see	
Formal and Informal leaders	**Aware** about rabies. **Participate actively** in meetings.	**Support** rabies eradication programs in the village. **Involve** local people to participate in eradication programs.	**Independently and actively** carry on rabies eradication programs in the village. **Develop** new local programs for rabies prevention and eradication.	The achievement of this boundary partners was very good (high) or already reach on level of Love to see. The formal leaders and some informal leaders actively involved in the programs. Moreover, they had innovative ideas to sustain community partcipation in rabies cadres group into formal structure that attached into village structures. It's called Village Rabies Working Group (VRWG) that formalized by Head of Village Leader Decree. More over, they also running micro-credit scheme to

				do independent fund-raising for supporting rabies cadres logistic and operational need. The representatives of local leader of each VRWGs also willing to be models and share their experiences to other districts in Bali Province . Traditional leader in one pilot village also started to encouraged community to bring the issue of dog control population by dog ownership restriction into the banjar/village traditional law.
Rabies Cadre	**Understand** and **aware** about rabies. **Participate actively** in meetings and trainings.	**Actively teach** people about rabies. **List and record** the village dog population. **Report** cases to the local authority.	**Assist the government** in rabies eradication programs. **Develop** new local programs for rabies prevention and eradication.	The achievement of this boundary partners were also very good (high), eventhough we could not say for all total of cadres. The level achivement also could be defined reached the Love to See level. Cadres involved actively in the program of dog registartion, public awareness and quick responses system on dog-case bite management, and also on supporting government to do door to door mass vaccination in their area . Further more, they were very creative to find innovative ways to solve their problem in the field. Until end of the project, new program that had been initially run by cadres was attach the rabies program in village rabies working group into healthy village program together. In this way, they could also initiated dog-leashing program and garbage management together to support their health and decreasing environment capacity carying for rabied dog or free-roaming dogs.

Behavior Changes of Boundary Partner:

A. Formal and Informal Village Leader

Progress Marker that we want to achieved from BP	Behavior Change of BP
Expect to See	
1. Aware about rabies	1. Formal Leader (Head of Banjar & Head of Village) really aware about rabies specially in their area. They allowed the public awareness and others program related with rabies shared in their regular meeting: woman meeting, integrated health services post activities (POSYANDU), pree-school program 2. Informal leader (traditional leader) very welcome to insert public awareness program in the traditional monthly meeting (*sangkep*) 3. Almost all head of banjar also involve as a cadre, and several people who also involve in traditional structure also become a cadre. 4. Formal leader and informal leader understand that their involvemnet not only to support by letter because their position but their involvement to understand and share their understanding to people is needed 5. Arise curiosity among the leaders related in more detail information 6. Asking about rabies program by the Government

2. Participate actively in meeting	1. Formal leader always actively shared the problem and update situation of their community related with rabies 2. Formal leader also shared their opinion and actively give some option on the trouble-shot activities related with rabies program in their area 3. Suggest to CIVAS filed staff to use another meeting opportunity to share the Rabies knowledge 4. Actively participate in the meeting that CIVAS arranged – experinces sharing / exchanges
Like to See	
1. Support rabies eradication programs in the village.	1. In every moment of cadres program – meeting, training, - formal leader always supported with official letter and encourage their people/villagers to also participate on the program ➔ made the program as part of formal village activity **2.** Formal leader also very open to coordinate with the livestock service office and education institutional on public awareness program for elementary school in their area **3.** Actively encourage the local society to involve in rabies program
4. Involve local people to participate in eradication programs	1. Head of Banjar choose representative people from their banjar to become cadres 2. Head of Banjar always propose to give opportunity for their cadres to get training as vaccinator to support mass vacc. program
Love to See	
1. **Independently and actively** carry on rabies eradication programs in the village	1. Release the Village Decree to formalized VRWG as apart of villages works agenda
2. Develop new local programs for rabies prevention and eradication	1. In progress on inserting the rearing dog managemnet and dog population control through dog-ownership restriction perspective program into local or traditional law

B. Rabies Cadres

Progress Marker that we want to achieved from BP	Behavior Change of BP
Expect to See	
1. Aware about rabies	1. Formal Leader (Head of Banjar & Head of Village) really aware about rabies specially in their area. They allowed the public awareness and others program related with rabies shared in their regular meeting: woman meeting, integrated health services post activities (POSYANDU), pree-school program 2. Informal leader (traditional leader) very welcome to insert public awaren program in the traditional monthly meeting (*sangkep*) 3. Almost all head of banjar also involve as a cadre, and several people who also involve in traditional structure also become a cadre. 4. Formal leader and informal leader understand that their involvemnet not only to support by letter because their position but their involvement to understand and share their understanding to people is needed 5. Arise curiosity among the leaders related in more detail information 6. Asking about rabies program by the Government

2. Participate actively in meeting	1. Formal leader always actively shared the problem and update situation of their community related with rabies 2. Formal leader also shared their opinion and actively give some option on the trouble-shot activities related with rabies program in their area 3. Suggest to CIVAS filed staff to use another meeting opportunity to share the Rabies knowledge 4. Actively participate in the meeting that CIVAS arranged – experinces sharing / exchanges
Like to See	
5. Support rabies eradication programs in the village.	1. In every moment of cadres program – meeting, training, - formal leader always supported with official letter and encourage their people/villagers to also participate on the program ➔ made the program as part of formal village activity 2. Formal leader also very open to coordinate with the livestock service office and education institutional on public awareness program for elementary school in their area 3. Actively encourage the local society to involve in rabies program
6. Involve local people to participate in eradication programs	1. Head of Banjar choose representative people from their banjar to become cadres 2. Head of Banjar always propose to give opportunity for their cadres to get training as vaccinator to support mass vacc. program
Love to See	
3. **Independently and actively** carry on rabies eradication programs in the village	1. Release the Village Decree to formalized VRWG as apart of villages works agenda
4. Develop new local programs for rabies prevention and eradication	1. In progress on inserting the rearing dog managemnet and dog population control through dog-ownership restriction perspective program into local or traditional law

Annex 3. Project Outputs

Project Outputs on Result Dissemination or Publication:

No.	Name of Event	Title of Articles	Presenter (OP =Oral Presentation) and First Author (P=Poster)	Place	Date
A	**Indonesia**				
1	Studium Generale for Students of Faculty of Veterinary Medicine	Dog Ecology and Its Relation on the Presence of Rabies in Bali, Indonesia	Kathie Hampson & Andri Jatikusumah (OP)	Faculty of Veterinary Medicine of Bogor Agricutural University, Bogor	2012
2	12th National Veterinary Scientific Conference of Indonesian Veterinary Medical Association	(1) Demography and Its Relation on the Presence of Rabies in Bali, Indonesia	Sunandar (OP) /Maria Digna Winda Widyastuti	Jogjakarta – Central Java	10-13 October 2012
		(2) Determinants on Vaccination Coverage and Its Consequences on the Rabies Control Program in Bali, Indonesia	Andri Jatikusumah (OP) /Riana Aryani Arief		
		(3) Dog Ecology in Bali and Its Implications on the Rabies Transmission	Andri Jatikusumah (OP) / Andri Jatikusumah		
3	Annual Meeting of Agricultural Research and Development Center of Department of Agriculture	Study of Socio-culture Aspects on Rabies Control Program in Bali	Edi Basuno	Manado – North Sulawesi	Maret 2013
B	**Regional / International**				
1	Ecohealth Conferences 2012	(1) Dog Demography in Relation to the Persistence of Rabies in Bali Indonesia	Andri Jatikusumah (P)	Kunhming, China	15-18 October 2008
		(2) Recommendations for Improving Vaccination Coverage in the Bali Dog Population	Maria Digna Winda Widyastuti (OP) /Riana Aryani Arief		
		(3) Dog Ecology in Bali, Indonesia and Its Implications for Rabies Transmission	Maria Digna Winda Widyastuti (P)		
		(4) Relating Dog Ecology to Disease Transmission: Rabies in Bali, Indonesia	Andri Jatikusumah (OP)		
		(5) Socio-cultural Study of Perceptions Towards Dogs, Patterns of Dog Ownership and	Chaerul Basri (P)		

		Practices for Rabies Control in Bali, Indonesia			
2	ISVEE 13th. 2012	Dog Ecology in Bali, Indonesia and Implications for Rabies Transmission	Andri Jatikusumah (P),	Maastricht, Netherlands	2012
		Determinants of Vaccination Coverage and Consequences for Rabies Control in Bali, Indonesia	Andri Jatikusumah (P)/ Riana Arief	Maastricht, Netherlands	2012
3	BECA Closing Workshop	Village Rabies Working Groups (VRWG)	Andri Jatikusumah (OP) / Maria Digna Winda Widyastuti	Bangkok	2012
4	**The Society for Tropical Veterinary Medicine (STVM) Whorkshop:** *"A Change in Global Environment, Biodiversity, Diseases & Health"*	Communities Involvement in Rabies Control Program in Bali, Indonesia	Edi Basuno (OP)	Centara Grand Beach Resort, Phuket – Thailand	*18-21 June 2012*
5	International Symposium on "10th Year Anniversary of Veterinary Public Health Centre for Asia Pacific"	Community-Based Model for Sustainable Rabies Control: An Ecohealth Approach	Ridvana Dwibawa Dharmawan (OP) / Andri Jatikusumah	The Imperial Mae Ping Hotel, Chiang Mai - Thailand	3-6 July 2013
6	The 14th KKU Veterinary Annual International Conference 2013	Optimizing Mass Rabies Vaccination Program in Bali Dog	Ridvana Dwibawa Dharmawan (OP)	KosaHotel, Khon Kaen - Thailand	6-7 June 2013

Project Outputs on Capacity Building:

No.	Kind of Activities and Target Audiences	Total Audiences (person)	Notes
1	Public Awareness on Rabies and Dog-Ownership Responsibilty		
	(a) Elementary School (ES) in Pilot Village	1,159 (Phase I) 1,124 (Phase II)	Phase I (Sibetan = 797; Melinggih Kelod = 362) Phase II (Sibetan = 773; Melinggih Kelod = 351)
	(b) High Junior School (JHS) in Pilot Village	686 (Phase I) 633 (Phase II)	Only in Sibetan
	(c) Elementary School (ES) in 107 school	21,865	Denpasar = 9,755 (26 ES); Gianyar = 7,037 (36 ES); Karangasem = 5,073 (45 ES)
2	Training for Rabies Cadres in Pilot Village		
	(a) Sibetan Village – Distrcit of Karangasem	52	Male = 28; Female = 24
	(b) Melinggih Kelod – District of Gianyar	32	Male = 20; Female = 12

3	Technical Training-Workshop for 30 Infectious Villages on preparation for VRWG (incl. Plenarry session participants)		
	(a) Regional 1	106	Bangli, Karangasem, Gianyar, Klungkung
	(b) Regional 2	109	Denpasar, Badung, Tabanan, Jembrana, Buleleng

Project Outputs on Policy and Practice:

1. Issue Brief on Dog Ecology: "Optimizing the Rabies Control Program in Bali through Understanding Dog Ecology and Relation of Dog with Society: Moving Knowledge into Action"

2. Issue Brief on Village Rabies Working Group: "Village Rabies Working Group: A community-based approach model for optimizing rabies control in Bali"

Annex 4. Meeting brief on dissemintaion result of the project "Optimizing Rabies Control Program in Bali: An Ecohealth Approach" on the Strategic Animal Infectious Diseases Workshop (Puri Nusa Indah Hote-Denpasar, 17 November 2012)

Dissemination Result of the Project "Optimizing Rabies Control Program in Bali: An Ecohealth Approach"

on the Strategic Animal Infectious Diseases Workshop Organized by Livestock and Animal Health Services Office of Bali Province

Waribang Hotel – Denpasar, Bali, 17-18 November 2012

The provincial level workshop on the Strategic Animal Infectious Diseases was conducted and organized by Livestock and Animal Health Services Office of Bali Province on 17-18 November 2012, at Waribang Hotel, Denpasar. This meeting discussed the progress and update on strategic animal infectious diseases in Bali Province. With the attendance mostly from representative office of nine livestock services from district/city level, this event become a potential venue to disseminate new findings and update zoonotic disease program control in Bali, included rabies. Center for Indonesian Veterinary Analytical Studies (CIVAS) was invited to present our progress outputs and recommendations.

The meeting was opened and closed by the Head of Livestock and Animal Health Services Office of Bali Province, Ir. I Putu Sumantra, MAppSc. Progress of the project "Optimizing Rabies Control Program in Bali: An Ecohealth Approach" was presented by Andri Jatikusumah, DVM, MSc and Sunandar, DVM. It described the result of dog ecology studies, socio-cultural studies and community empowerment program that had been implemented with an ecohealth approach. Good appreciation and enthusiasm was shown by all attendances through interactive discussion led by the moderator, Anak Agung Gde Putra, DVM, MSc, PhD, SH. Participants, which reached approximately 30 persons, appreciated the many findings on dog ecology aspect that were very important to be known and explored to support rabies control program in Bali, such as the findings on vaccinations coverage on puppies and free-roaming dogs that need to be given more attention, the peak of puppy birth, the high contact rate between human and dogs, the simple calculation model for estimating dog populations based on female fertile dogs presence in the villages, the findings on how community perception on dog rearing and rabies become important things to encouraged their participation in control program, and the success story of how community in pilot village are willing to participate as rabies cadres and developed village rabies working group to save their village form rabies threats. In this meeting, the knowledge of an ecohealth approach as a suitable approach for controlling zoonotic diseases with rabies as a model had been disseminated.

In this event representatives from the two pilot Village Rabies Working Groups also presented and shared their experience and activities. I Nengah Sumartha, SPd as head of Sibetan Village and act as Directive Board for Village Rabies Working Group of

Sibetan village was the actor who had the idea to formalized rabies cadres activity into official structures as working group and attached it to the village structure by releasing a Head of Village Decree. He shared how the village leader can take a role for supporting and encouraging community participation, facilitating their willingness and thinking broadly for consider the community activities being sustain. He also shared how community knowledge and behaviour changed and they agreed to do fund-raising for operational and logistic costs by running the micro-credit scheme. Dr. Taruna Nugraha as a the Chairman of Village Rabies Working Group of Melinggih Kelod Village, District of Gianyar, shared program and activities run in the working groups. With the facilitator I Ketut Gede Natakesuma, DVM, MM, the head of Animal Health Division, we also had the opportunity to do an auction of rabies and responsible dog-ownership posters which were created by pilot village cadres in the posters competition organized by CIVAS. Funds collected from the auction was delivered to both working groups and used as endowment funds to run the working groups.

This workshop was closed by disseminating an executive summary of the project. Each participant was encouraged to report and share it to their institution so they can use the outputs and recommendation of this ecohealth project. Head of livestock services also did the press release with Bali local television and gave high appreciation to the children from pilot villages who performed their talent on singing a rabies song “Let’s Prevent the Rabies”.

Annex 5. Meeting brief on dissemintaion result of the project "Optimizing Rabies Control Program in Bali: An Ecohealth Approach" on the Internal Meeting of Livestock Service Offices and Rabies Expert Team of Incident Control System of Bali Province (Sanur Paradise Plaza Hotel – Denpasar, Bali, 11 April 2013)

Dissemination Result of the Project "Optimizing Rabies Control Program in Bali: An Ecohealth Approach"

on the Internal Meeting of
Livestock Service Offices and Rabies Expert Team of Incident Control System of Bali Province

Sanur Paradise Plaza Hotel – Denpasar, Bali, 11 April 2013

Internal meeting between Center for Indonesian Veterinary Analytical Studies (CIVAS), Livestock Services Offices of Bali Province and similar institutions from three areas where project had been done (Denpasar City, Karangasem District and Gianyar District), and Rabies Expert Team of Incident Control System of Bali Province was conducted on 11 April 2013, at Sanur Paradise Plaza Hotel. The purpose of this interactive meeting was to discuss systematically the outputs of the rabies ecohealth project "Optimizing Rabies Control Program in Bali: An Ecohealth" internally between CIVAS as researchers, livestock services office as supporting partners and end users of the outputs, and rabies expert team of Bali Province who had experiences with many project, research analysis and rabies situation in Bali.

The meeting was opened and closed formally by the Head of Animal Health Division of Livestock and Animal Health Services Office of Bali Province, I Ketut Gede Natakesumah, DVM, MM. The project result of "Optimizing Rabies Control Program in Bali: An Ecohealth Approach" was delivered by CIVAS team, Andri Jatikusumah, DVM, MSc, Sunandar, DVM, and Maria Digna Winda Widyastuti, DVM. The interactive discussion was led by two moderators, Anak Agung Gede Putra, DVM, MSc, PhD, SH and Edi Basuno, Dr, MPhill. Positive response was delivered to this project for many benefits of the outputs. Representatives of each livestock services from the three areas that were involved in this project gave their good appreciation, inputs and also expectation for the next possible cooperation to actualize project recommendations. They also will used the technical data provided from this project as update baseline to support rabies control program in each area, such as population estimate for defining the target of rabies vaccination coverage, the need of concentrating rabies vaccination on puppies and free-roaming groups, new information on the peak of puppies born in the year for defining appropriate time for mass vaccination, and the concern of dog population growth rate that needs to be control.

Other institutions also invited in this meeting were Disease Research and Investigation Center of Bali and Yayasan Yudhistira Swarga. Both institutions also put intention and suggestions for follow up on the community behaviour changes and the sustainability of rabies village cadres in two pilot villages and its structure on Village

Rabies Working Groups. The government must put more attention and mentoring to sustain community participation. The community participation in banjar level could be combined and linked to traditional village structure and it was potentially positive for supporting rabies control program at grass-root level. In the discussion there were also notes on upgrading community or rabies cadres to become field assistance on doing government rabies control program, such as vaccination, case data recording and control population. Traditional village structure also noted as potential stakeholders for supporting mass vaccination program and dog control population by providing dog shelter in each banjar, and also increasing the public awareness through inserting dog rearing program in the local or traditional law.

Annex 6. Activities brief of Workshop on Result of the Project "Optimizing Rabies Control Program in Bali: An Ecohealth Approach" Sanur Paradise Plaza Hotel – Denpasar, Bali, 4 June 2013

Workshop on Result of the Project "Optimizing Rabies Control Program in Bali: An Ecohealth Approach"

Sanur Paradise Plaza Hotel – Denpasar, Bali, 4 June 2013

With the completion of last activities on evaluation and monitoring on the village rabies working group in pilot villages on May 2013, Center for Indonesian Veterinary Analytical Studies has finished the project "Optimizing Rabies Control Program in Bali: An Ecohealth Approach". This project which was supported by International Livestock Research Institute (ILRI) and International Development Research Center (IDRC) started on January 2010 and had combined desk study, filed studies, and community empowerment program with the ecohealth approach for supporting government on optimizing rabies control program in Bali. Official closing of this project was conducted through the workshop on 4 June 2013, at the Sanur Paradise Plaza Hotel, Denpasar. The purpose of this meeting was to disseminate final project results and recommendations and explore possible follow ups through interactive discussion among stakeholders.

The workshop was attended by the representatives of Directorate of Animal Health (DAH) and the Directorate of Veterinary Animal Health (DVAH) of Ministry of Agriculture (MoA), and also the representatives of Ministry of Health (MoH). There were representatives of both ministry and technical services office on Bali provincial level and district level. Other stakeholders involved were from local and international NGOs, university, and representatives of veterinary professional association. The two pilot villages and its Village Rabies Working Groups (VRWG) were also invited and involve actively in the discussion and sharing. The workshop was officially open by Muhammad Syibli, Dr, as representative of DAH-MoH. Representatives of each institution in this collaboration project delivered their speech; they were Jeff Gilbert as coordinator ILRI-EcoZd project, Tata Naipospos, DVM, MPhill, PhD as Chair of Directive Board of CIVAS, and I Putu Sumantra, Ir, MAppSc as the Head of Livestock and Animal Health Services Office of Bali Province. The opening ceremony was enlivened by the performances of kids group from Meligih Kelod Village singing the rabies song, and the traditional music-songs described rabies and VRWG's activities in Sibetan pilot village.

In front of up to 80 participants, the project results and recommendations were delivered by CIVAS team: Andri jatikusumah, DVM, MSc (Director of CIVAS), Maria Digna Winda Widyastuti, DVM (Project Coordinator), and Sunandar, DVM. Interactive discussion was led by Anak Agung Gde Putra, DVM, MSc, PhD, SH as the moderator. On the project recommendations and its possible follow-up session, Edi Basuno, Dr, MPhill was the speaker, and it was followed by interactive discussion led by Iwan Willyanto, DVM, MSc, PhD. The discussion intended to highlight the need of continuous effort of

all stakeholders to use the project results and explore possible and potential activities to developed further comprehensive programs to support Bali free from Rabies. The follow up to be considered were focused on optimizing rabies control programs including better planning on logistic and effectiveness on vaccination implementation based on the project outputs, optimizing public education with consideration of socio-cultural aspects, optimizing dog population management and development of "dog shelter" with the approach system of Capture, Neuter, Vaccinate and Release (CVNR) by involving local and international NGOs participation, and establishment of next VRWGs in others village in Bali to support government to reach Bali free from rabies on 2015. Details of the final recommendations delivered are:

1. **Optimizing Mass Vaccination**
    - Planning of vaccine stock needs and mass vaccination effectiveness could be improved through better knowledge of the number of dogs in the population. This could be achieved using population estimation methods (refer to CIVAS recommendation).
    - Herd immunity could be improved by increasing vaccination coverage of dogs less than 1 year of age (puppies and juveniles).
    - Vaccination coverage could be increased by timing mass vaccination 2-3 months before birth peak months (March and November) as there are the most number of puppies/juveniles that could be vaccinated.
    - A durable and easy to install vaccination collar is critical for the implementation of mass vaccination. It improves the accuracy of vaccination coverage estimation and has a positive psychological effect (assurance) for the public.

2. **Optimizing Public Education**
    - Involvement of all community elements (eg. village/banjar figures, religious figures, teachers, health cadres, *posyandu* cadres, etc) in the delivery and spread of key messages is necessary for a sustainable public education.
    - Consideration of social-cultural aspects is an essential part in the planning and implementation of public education.
    - Socialization of knowledge on rabies and responsible dog ownership needs to be improved using communicative and interactive media tools tailored specifically for its target audience. Current advancement in mass communication techniques (eg. electronic media and television) should also be considered.
    - Information dissemination could be done more effectively through participative meetings involving village/banjar leaders, health cadres, *posyandu* cadres, rabies cadres, and mass media.
    - Efficiency of public education could be improved by building the capacity of school teachers in educating students, particularly those in elementary levels, on rabies and responsible pet ownership.
    - Public education is also recommended to target and involve all stakeholders, especially in tourism and service sectors.

3. **Optimizing Dog Population Management**
    - Recommended strategies on dog population management which could be initiated by the Provincial Government in collaboration with experts and other stakeholders is by promoting and implementing:

i. Dog Registration and Vaccination Cards in accordance to Bali Provincial Regulation;
ii. Owner obligation to contain or leash dogs in accordance to Bali Provincial Regulation;
iii. A campaign on humane dog spay/neuter;
iv. A campaign on humane contraceptives for dogs;
v. The establishment of dog shelters with Catch, Neuter, Vaccinate and Release/CNVR protocols.
vi. A cleanliness and garbage management campaign to reduce food sources for stray dogs.

- Implementation of the dog registration and vaccination card program should involve village level rabies cadres under supervision of Livestock Services.
- A recommended dog contraception program is the injection of chemical contraceptives along with mass vaccination.
- The dog shelter program with CNVR could be developed together with humane societies and have local and/or international non-government organizations as implementing agencies.
- The cleanliness and garbage management campaign could be done in collaboration with the Sanitation and Landscape Service Office and involve businesses such as hotels, restaurants, culinary services, and garbage cleaning volunteers.

4. **Village Rabies Working Group (VRWG)**
   - The Village Rabies Working Group already established in Bali needs to be supported and assisted through continuous involvement in rabies control programs conducted by Livestock Services or other government offices.
   - Livestock Services needs to facilitate this Village Rabies Working Group development and capacity building not only on rabies, but also regarding the mitigation of other strategic infectious animal disease. Hopefully in the future members of the VRWG could be acknowledged as community based animal health workers.

5. **Activities to Support Bali Free of Rabies 2015**
   - Advocate rabies control, study, and public education regarding animal transportation to regional governments and stakeholders outside of Bali to prevent rabies reintroduction.
   - Increase the capacity and sensitivity of animal surveillance programs to better support Bali Free of Rabies 2015.
   - Implement proactive preventive measures through the Animal Quarantine Agency for better supervision of animal movement in and out of Bali.
   - Promote understanding of return of investment concept in terms infectious disease control to policy makers at all levels through the comparison of rabies prevention and control cost against material and non-material losses, including potential loss that would be suffered otherwise.
   - Future plans regarding prevention and control programs for when Bali is declared rabies free in 2015 should be initiated and discussed early with all stakeholders.

Annex 7. Issue brief on Dog Ecology and Village Rabies Working Group

Optimizing the Rabies Control Program in Bali through Understanding Dog Ecology and Relation of Dog with Society

Moving Knowledge into Action

In 2008, Bali was struck by rabies. Since then, the rabies outbreak in Bali has cost more than 13 million dollars and caused more than 145 human deaths. Significant financial and human resources have been invested in managing rabies on the island.

The government's current control program includes mass dog vaccination, selected targeted culling of dogs, and community education. Remarkable progress has been made by government leaders and stakeholders to combat this disease, but targeted strategies are needed to reach the government's goal of eradicating rabies from Bali by 2015.

The Centre for Indonesian Veterinary Analytical Studies (CIVAS), in partnership with livestock and human health officials, conducted a large study across several villages in Bali from 2010-2012 in order to help local governments understand how they can better manage rabies and eradicate rabies from the island by 2015. This brief focuses on key findings on dog ecology (demography, fecundity and behavior) and its relationship to the local community in Bali. We provide some specific strategies decision-makers can implement to support the rabies control program in Bali. The brief is organized around gaps in the current rabies control program that were identified through our research and solutions for closing these gaps.

WHY IS RABIES IMPORTANT?

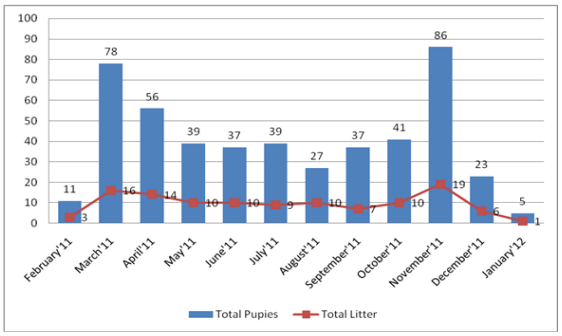
- Rabies is one of the most deadly infectious diseases on earth transmitted to humans through bites by rabid animals. Dogs are the source of most human deaths.
- Uncontrolled rabies costs the government of Bali millions of dollars, Rp 4.5 billion per year on PEP (Post Exposure Prophilaxis)alone. The cost is much higher when reduced productivity and other medical care and treatment of those who are infected are included.
- Rabies undermines the livelihoods of poor families by forcing them to sell or slaughter their livestock to get money to treat infected family members.
- Rabies may cause a public panic, leading people to destroy any animals that are known to transmit the disease without a sound reason.
- Rabies is a preventable disease. Unlike many other emerging zoonoses (such as dengue and avian influenza), safe and effective animal and human vaccines are widely available for its prevention and control.
- Cost of dog vaccination is a fraction of the cost of human treatment for rabies. The cost for dog vaccination is about 2 USD per dog and the cost for human treatment could reach 60 USD per person (for VAR injections of VAR and other medical care).

OPTIMIZE MASS VACCINATION

Successful mass vaccination programs rely on accurate population estimates. This could be used also for planning vaccination campaigns, determining vaccination coverage, and anticipating outbreaks.

Discrepancies on dog population and vaccination coverage estimates can hurt mass vaccination campaigns and disrupt eradication efforts. Key strategies to optimize mass vaccination efforts across Bali are discussed below.

Target vaccination efforts within districts based on age of the dog, peak birth times, and geographical location



By monitoring the birth rates of fertile female dogs and puppies in their litter for one year, we developed a simple formula to estimate changes in the annual dog population at the village level. We found puppies born along the year with two birth peaks in a year, around March and November (see Figure 1). Decision makers can use our formula to estimate the size of dog populations in their districts and identify peak birth times so that mass vaccination reaches both adult and juvenile dogs /puppies.

Known challenges within mass vaccination: puppies

- Owners tend not to report the presence of puppies to local authorities or vaccinators because they are afraid that the vaccine will make the puppies sick or kill them.
- Some people believe it is not possible to get rabies if bitten by a puppy.
- This raises concerns since the vaccination coverage for puppies is so low. In fact, in 2012, rabies cases among puppies made up about 1/3 of the total cases (39% form total confirmed cases).
- Puppies make up about 4% of the free roaming dog population, suggesting most puppies are owned and restrained.

Targeted communication to puppy owners that addresses misunderstandings about the rabies vaccine and promotes the important of vaccinating puppies would be an effective strategy in Bali.

Although vaccination in owned dogs has achieved high coverage – more than 70% - this is only true for adult dogs. For dogs less than 1 year old, the coverage, at most reaches 50% and at worst, less than 20%. Vaccination efforts are not reaching puppies. Our study identified a few of the reasons why this is the case in Bali and how it could be addressed (see Box 1).

Vaccination coverage is highest in urban areas compared to suburban and rural areas. Urban dogs are generally restrained, while suburban and rural dogs are mostly allowed to roam free and that the overall dog to human ratio is higher in the suburban and rural areas. With a greater proportion of unvaccinated dogs roaming free in suburban and rural areas, there is a greater potential for rabies to spread more quickly. We recommend that districts consider how to focus vaccination on dogs in the suburban and rural areas.

Introduce long-lasting collars that make it easier for community members and officials to identify the vaccination status of dogs

When someone is bit by a dog, the first question that needs to be answered is the vaccination status of the dog. Without this information, the victim faces potentially unnecessary and costly medical treatment and the

"Our Bali dog it's quite clever to release the collar from their neck. They chew and bite the collar thus the collar was shred…..when I saw dog with collar free roam around our neighborhood give sense to myself that our neighborhood is safe."

-Focus group participant from Sibetan

community may panic. In addition, district governments need resources that help officials track vaccination coverage and plan for future programs. The yellow vaccination collars currently being used in Bali are known to break and fall off of dogs and the colored spray paint eventually wears off. A more long lasting approach, such as durable collars, need to be widely available so that bite cases can be managed quickly and appropriately and officials can more accurately estimate vaccination coverage.

OPTIMIZE DOG POPULATION MANAGEMENT

Remarkable progress has been made by government leaders and stakeholders to combat rabies, but now there is a concern that the dog population will easily rebound due to fertility of the dog and the availability of food waste (high carrying capacity). Population rebound will not only undermine the results of culling efforts, but it also reduces vaccination coverage through the addition of new, susceptible dogs in the population. We estimate that in Bali, the average-sized litter is about 4 puppies with birth happen throughout the year. Our study found that for every 100 fertile females, the dog population grows by 1.7 to 3.5 times in a year. Controlling the dog population is widely recognized as part of a rabies control program, but what works best depends on the context. Key strategies for optimizing dog population management in Bali are discussed below.

Improve the management of dog populations and vaccination coverage over the long-term without culling dogs, but by considering methods to control fertility

We found that culling of dogs had no significant effects on vaccination coverage, suggesting no positive benefits of culling at this stage of rabies in Bali. Furthermore, our findings indicate that culling will lead to the movement of new dogs into new areas. It seems prudent to investigate other measures which may assist in maintaining or reducing the size of the dog population and lower the number of births of susceptible puppies. For example, we found that many dog's main food source was garbage (70%). Thus, we encourage decision-makers to think about garbage management as part of a population control strategy. Some fertility control options, which are not mutually exclusive, include:

- Promotion of responsible pet ownership and sensible dog restraint
- Better municipal and village garbage control
- Spay/neuter campaigns
- Use of injectable contraceptives concurrently with rabies vaccination programs

OPTIMIZE PUBLIC AWARENESS PROGRAM

The Bali Provincial Government has made efforts to increase awareness on rabies issues over the past few years, and has improved the understanding of local people about rabies. Even though most Balinese people have heard about rabies, it doesn't mean that they know what to do and how to respond when bitten by a rabid dog. Through public awareness activities that are part of a related CIVAS project, we have witnessed that communities in Bali are very open to learning about rabies and how to care for their dogs. Responding to this need for information in a culturally sensitive manner can maximize messages. Some key strategies based on what we learned are discussed below.

Take into account cultural beliefs when designing public awareness programs and involve the communities themselves to disseminate key messages

> *"Keeping dogs for the Balinese is just part of the way we are; it is not part of religion but we respect dogs due to the story of Yudhistira…They [dogs] have a number of functions…but many times people just want dogs around since you feel quiet, something hollow or not complete if a dog is not there. We are used to having so many dogs around since we were young."*
> -Focus group participant from Sibetan

Dog ownership is very much part of the Balinese culture and identity. Dog ownership is motivated by a combination of culture, personal taste and function as dogs are used as guards, spirit alarms, companion animals, status symbols, and for traditional medicine, food and religious sacrifices. The Balinese have a very close relationship to dogs. In the past, dog bites was accepted as something common. With education, many understand that dog bites can be harmful and needs proper treatment. Even so, there are many who still do not understand. For example, 41% of people indicated that washing a dog bite wound was not important.

Seventy-nine percent of the owners in our study allow their dogs to roam free. We learned that one of the reasons why owners do this is because they feel that restraining the dog would be unkind. Also the owner does not have to spend his or her own money to feed the dog because it can find food on its own. Education about responsible pet ownership needs to be sensitive to these factors. We see potential for using traditional law in Bali to support the government rabies control program. This strategy would encourage culturally-sensitive regulation that reinforces messages about what it means to be a good dog owner.

In a related CIVAS project, we have seen that understanding community attitudes toward pet ownership helped us effectively mobilize community leaders as part of a Village Rabies Working Group to reinforce messages on rabies prevention, bite case management, and dog-ownership responsibility. Community members shared messages with each other and as a result, they were empowered to participate more fully in the rabies control program. Regardless of who delivers the message, public awareness programs must consider cultural beliefs about rabies and dog ownership.

> *"We've already felt the impact in our community. On average, almost 90% of the community in this banjar joined the vaccination program. Some people that haven't restrained their dogs before, put some money to buy a chain for their dogs"*
>
> -Banjar head from a pilot village

CONCLUSIONS

The relationship between dogs, rabies and people in Bali is multifaceted and complex. While recent vaccination campaigns have significantly reduced both human and dog cases. Government commitment on education, improving on dog population management and community participation are needed to ensure elimination of the disease from the island by 2015.

The results of our study showed that this may be achive through: (a) **optimizing dog population management** by targetting vaccination efforts within districts based on the size and age of the dog population, peak birth times, and geographical location as well as the application of long lasting vaccination identification; (b) **optimizing dog population management** by improving the management of dog populations by considering methods to control fertility; and (c) **optimizing public awareness program**

by taking into account cultural beliefs when designing public awareness programs and involving members of the communities to disseminate key messages

1. Decision makers can use our formula to estimate the size of dog populations in their districts and identify peak birth times so that mass vaccination reaches both adult and juvenile dogs.
2. Long lasting and durable collars, need to be widely available so that bite cases can be managed quickly and appropriately and officials can more accurately estimate vaccination coverage.
3. We encourage decision-makers to think about garbage management as part of a population control strategy.
4. Some fertility control options, which are not mutually exclusive, include:
   a. Promotion of responsible pet ownership and sensible dog restraint
   b. Better municipal and village garbage control
   c. Spay/neuter campaigns
   d. Use of injectable contraceptives concurrently with rabies vaccination programs

Contact information

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VILLAGE RABIES WORKING GROUP

A community-based approach model for optimizing rabies control in Bali

Historically, Bali has been free from rabies. In late 2008, rabies outbreak came to Bali and caused for people died. By the end of 2011, rabies had spread to 273 of 723 villages in Bali. Human fatalities had reached 145 on July 2012, and there's no more human death because of rabies until know. Eventhough, rabies in animal still reported and average number of bite-cases of suspect animal for rabies is 145 daily.

Government response in the early days of the outbreak was swift. The government's control program consists of phases of mass vaccination, selective targeted elimination, traffic control, bite-case management and education with a goal to eradicate rabies from the island by 2015. The first island-wide mass dog vaccination phase started in October 2010 with the fourth phase wrapping up on April 2013. Most recent data show that more than 70% vaccination coverage had been achieved. Despite these efforts, there's a lack of comprehensive approach on existing aspects related with ecosystem health that need to be considered on controling rabies, which are related with beter understanding on dog ecology, socio-culture and community engagement in the program. Center for Indonesian Veterinary Analytical Studies (CIVAS) in partnership with Bali governments especially with Livestock and Animal Health Services Office of Bali Province supporting by International Livestock Research Institute (ILRI), developed two pilot villages in Karangasem District (Sibetan Village) and Gianyar District (Melinggih Kelod Village) and involve in the community based rabies control program from 2011-2012. Promising preliminary results from pilot villages with the initiative of of Village Rabies Working Groups (VRWG) establishment indicate that it could be used effectively across other districts in Bali to support government program on control and eradicating rabies. CIVAS and livestock services office in province level have plan to facilitate two day technical training-workshop for ecouraging rolling out of VRWG in 30 hot-spot villages where still has rabies cases in the last sixth months.

WHY IS COMMUNITY PARTICIPATION FOR RABIES CONTROL PROGRAM IS IMPORTANT?

- Rabies cases in many countries are related to the community's relationship with their dogs. Community know and understand their dogs , that's why the community participation is needed.
- The success of comprehensive efforts for control and eradicate rabies could not achieved by government only, but need an involment other stakeholders included community.
- Community participation in many aspect for controling zoonotic diseases based on their capacities had been proven for better success stories, since community could take apart for supporting government to do the program in cost-effective means.

What and Who does Village Rabies Working Group (VRWG)?

Village Rabies Working Groups (VRWG) is a group of rabies cadres within the village community that representing 3-5 people from each banjars. The cadre is a local people that act as a volunteer in the village rabies control program. Cadres were selected

based on their willingness to participate in securing their own village from rabies threat, regardless of their gender, age, education background and occupational status. The VRWGs were established through community-based approach and their capacity to work together and develop programs in line with the government program. With the establishment of the VRWG, cadres have built networking among themselves, among villagers and with the livestock and health services officers.

Capacity Building for Cadres. CIVAS in cooperation with livestock and human health services offices provided two day training-workshop to increase cadres's capacities. The training comprised of various topics including how to become a good cadre, rabies in animals and humans, responsible dog ownership, appropriate and rapid response to dog bite cases, data collection as part of the dog registration program, and communication techniques with awareness key message to convey to communities as part of socialization activities.

> *"Initiative for VRWG establishment by Decree of Head of Village come up with the main reason for continuing community participation in our village. We had much benefit with the presence of cadres and VRWG in our village. Villagers more aware about rabies, actively participated in the mass vaccination program and understand for doing first-aid on dog case-bite, also reporting the case or the prsesence of rabid dog or any suspect animal with rabies..."*
> *-- Head of Sibetan Village ---*

Intregation VRGW into official structure. The VRWG becomes an official structure of the village legalised by a decree of the head of the village and supporting by an official letter from the livestock services institution. With this official structure, the community become an independent form attached on village that in logistic-administration has repsonsibility to the head of village.

Funding and Activities Supervision. The VRWG relies on open system for fund-raising including independent initiative or support from livestock dan health services institution, local government or other donors. In technical aspect of activities, the VRWG needs support and mentoring from both livestock and health technical services institution to continue their activities for supporting government program. Initially, endowment fund received from banjar and village, provincial livestock services through auction of poster created by cadres , and external donor through CIVAS. The VRWG used the money only for rabies control program in certain village. They used village micro credit mechanisme to revolve the fund, then use the benefit for supporting logistic and operation needs.

What does Village Rabies Working Group (VRWG) Do?

#1: Rapid Response

Cadres have an important role in two aspect of rapid response, which are dog bite case management and case reporting. Cadres helped villagers when dog bite cases happen by giving advice, providing first aid, or bringing them to the hospital to get medical treatment. They also trained to report bites cases to the head of banjar/village and to livestock services institution. Cadres keep records of all suspected rabies cases of human and animals in their village, including the complete history of how the dog-bite happened, ownership and vaccination dog status, and extend management to the dog bite-case.

#2: Dog Registration

> *"We actively encourage community to report their dog-ownership and its dynamics through community meeting both in woman meeting (PKK/Posyandu) and men meeting (sangkep)."*
> *--- Cadre of POKJA Rabies Sibetan ---*
>
> *"Rabies cadres in our village work together with woman group cadres in PKK through Dasa Wisma structure and we compile it in our monthly regular meeting. One cadre in Dasa Wisma structure responsible to update information from five anngkul-angkul (Balinesse House community)."*
> *-- Cadre of POKJA Rabies Melinggih Kelod ----*

The rabies cadres established a dog registration program by actively visiting houses or passively through existing regular social meetings. Dog registration card is used to collect information on number of dogs and other pets, sex, age, breed, number of new puppies, number of deaths, dog movement (sale, buy, or move in/out of the village), vaccination status and rearing management status (confined or free-roaming). Cadres actively verified or updated data through door to door visit or through the networking built between cadres. Cadres also encouraged to be aware and report of any stray dogs or dogs without clear ownership roaming around in their village.

#3: Public Awareness

The rabies cadres were actively doing public awareness focusing on two topics. The first topic is general information on rabies and how to avoid and respond to dog bite cases, and the second topic is responsible dog ownership and the importance of dog registration. Awareness materials used were brochure, poster, flipchart, movie and songs. Public awareness activities were mostly done through class presentations and interactive discussions through their regular social meeting (i.e. men meeting, women meeting, youth meeting), direct discussion or conversation in small groups around cadre's house, and meeting by their profession (i.e. teacher, health post staff, cooperative staff). Each cadre provided with a name plate stick in front of their house indicating that they are rabies cadre and people around could ask for information and help.

What are The Benefits of The Village Rabies Working Group (VRWG)?

#1: Supporting an optimal masss vaccination program with adequate estimates of the local dog population

Successful mass vaccination programs rely on most accurate population estimates for planning purposes and for determining vaccination coverage. With dog registration efforts led by cadres would help to provide more accurate data from the field level, which will support adequate population estimates as a baseline for determining vaccination coverage. Based on our demography study, vaccination in owned dogs has achieved high coverage - more than 70% - but this is only true for adult dogs; while in dogs below one year of age - the coverage was less than 50%. While based on our fecundity study, there were two peaks of puppies born in a year, which around March and November. Beside contribute on the confidence of the coverage vaccination achievement, more over this information could also support the livestock services officers to have better plan on mass vaccination programs included for puppies and free-roaming doags, and also implement other control program as needed (i.e. birth control). Beside providing datas, rabies cadres in the village could be appointed as a technical

assistant in the field with sufficient training support and under supervision from livestock service institution. As a local people, cadres could approach dog owner better to participate on rabies vaccination or other government program.

#2: Providing more accurate information on dog bite cases that follow-up with rapid response

Early response and early detection of bitten cases sometimes it depends on how the community recognizes the dog that bite the victims. In many bitten cases before, a lot of village communities doubt and did not recognize the dog in their own neighborhood. This could be lead into panic and unnecessary expenditure for the medical treatment. Cadres through their dog registration program and rapid response activities could support the health and livestock services officers with more accurate information on the occurence of the dog bite cases, provide first aid to the victims as well as identification of the dogs and their vaccination status.

#3: Supporting wider coverage of community awareness on how to respond to rabies and how to become a responsible dog ownership

The effort to increase awareness on rabies issues has been conducted over the past few years, and has improved the understanding of the society to respond to rabies. Despite of this achievement, our socio-culture study found that information did not adequately reached all levels of community - especially in the rural area. With strong culture of Balinese to free-roam their dogs that had been practiced since past of centuries, it was quite a challenge for the government to acquire a significant impact on behaviour change of the community, thus can optimize vaccination coverage and rapid response. Based on demography study done by CIVAS, vaccination coverage still quite low in free-roaming population which more found in rural area. The presence of cadres among the local community could help to pass updated information related to rabies, continously share information that can improve community involvement, and at the same time encourage the owner of the dog to take part in rabies control program as responsibility to have dog. Cadres could approach community as a specific target audiences based on unique culture and condition in each area.

> *"Although we could not release the decree from our livestock service institution, we had released an official supporting letter by head of our institution for POKJA Rabies establishment, as we realize that its activities are in line with government program and will help government much. We do appreciate for this initiative and we believe that POKJA could work together with us for optimizing rabies control program in certain area."*
>
> *--- Head of Livestock Division – Livestock, Fisheries and Marine Services Office of Gianyar District ---*

Recommendations

The community participation in rabies control program could be encouraged by continous participatory approach based on what their needs and their capacities to involve in the program. The VWRG model can be used as a cost effective means to enhance rabies control efforts by:

- increasing rapid response on dog bite-case management and reporting
- promoting dog-registration to support adequate dog poupulation estimates
- increasing knowledge and public awareness

By replicating this model to other villages in Bali province, there's a great opportunity to demonstrate or prove how communities can involvein in optimizing rabies control program efforts as we approach 2015 for Bali free from rabies. The local government, village leaders and technical service institutions are the key to success in the replication of this VRWG model.

Contact Information

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