
DISCUSSION

Policy Analysis Approaches in Implementing the Ecological Engineering in Vietnam: Experiences from LEGATO – An Interdisciplinary Project

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Abstract: The paper examines the potential participations of stakeholder groups for applying the ecological engineering from policy approach. The focus here is on analyzing the demand of strengthening sustainable linkages among the policy target group – policy implementing group – policy innovation group is most suitable solution to construct the ecological engineering application in rice cultivation in Vietnam. Unlike other projects, the diversity outputs and outcomes of LEGATO can provide a huge necessary sources from interdisciplinary studies about the conditions for ecological engineering application in practice. Through policy analysis approach, authors identify the roadmap for policy preparing process of ecological engineering application within LEGATO for Kim Thanh district, Hai Duong province, Vietnam.

There are four sections in this paper: (1) Policy paradigm and social construction (2) Policy approach and stakeholder involvement within LEGATO – an interdisciplinary project (3) Policy analysis approaches in implementing LEGATO project (3) The role of key internal stakeholder groups in implementing the policy of ecological engineering application (4) Raising the participants of key internal stakeholder groups in implementing ecological engineering in Vietnam (case study in Kim Thanh district, Hai Duong province) and further steps in policy making process.

Key words: interdisciplinary research, stakeholders, policy analysis approach, paradigm, policy making process

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1. Policy paradigm and social construction

The concept of paradigm of a policy – a framework that defines philosophy/doctrine, conceptions, norms and definitions, was coined by Vu Cao Dam (2011) [1], pointing out that each policy has its own paradigm, the impacts of (public) policies can be considered the roots for all social differentiation.

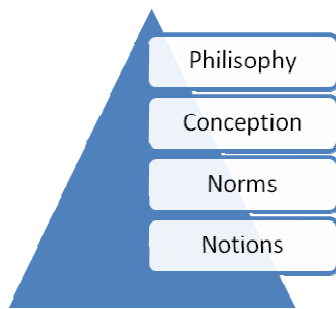


Figure 1. Paradigm of a policy.

Sources: Vu Cao Dam, Policy Analysis textbook, VNU Publisher, 2011

Therefore the impacts of government to society through (public) policies are just the interaction between two paradigms. When they

collide, first the de – structuring of each system will happen. This is the time the definitions, norms, concepts or even philosophy of people inside a society be affected by new things brought by the paradigm of new policies and vice versa, elements of policies be affected by traditions or customs for example. This double ways effect then can lead to the success or failure of the de – structuring stage, which also point out new policy succeed or fail. If it fails, then the government was unable to influence whole society or a group of people; if not, then the interaction of the two systems would lead to the re – structuring phase. In the second stage, there can be three options:

- (1) Policy trying to adapt to the framework of society
- (2) Society has to change to suit the content of new policy
- (3) They denied each other and choose a new paradigm which suitable the most, it all results in the development of the society.

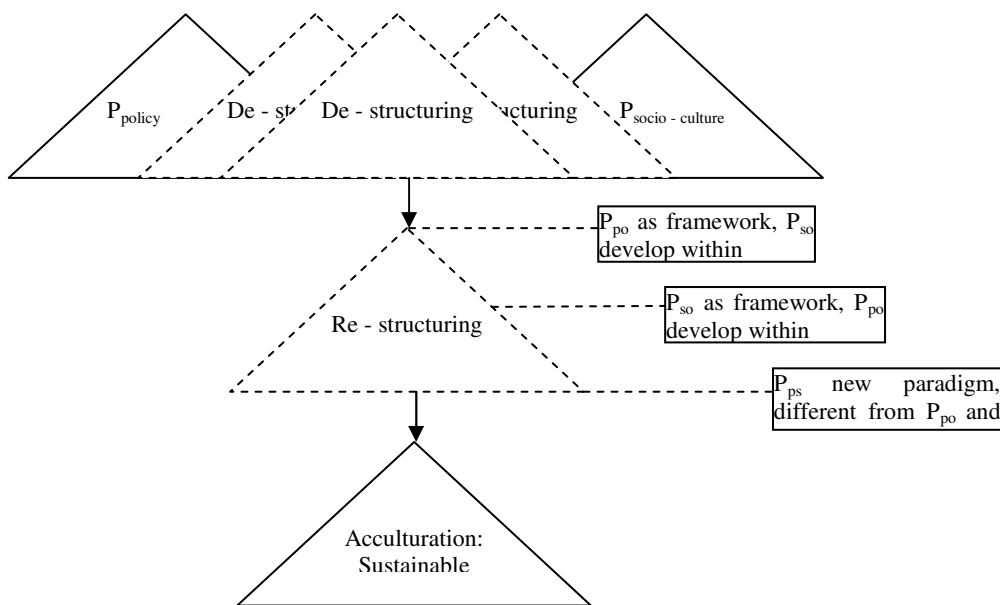


Figure 2. How policies change society

Sources: Vu Cao Dam, Policy Analysis textbook, VNU Publisher, 2011

In other words, the second phase is the time of old and new interactions, when old things do not disappear and new things are not yet widely accepted. Whether (1) (2) or (3) happened, the third phase of acculturation comes after that, and the society will enter a new period of sustainable development. This balance of development will stay the same until new policy – a new paradigm appears and interacts with old ones.

2. Policy approach and stakeholder involvement within LEGATO – an interdisciplinary project

* Overview on LEGATO project

LEGATO¹ project aims to advance long-term sustainable development of irrigated rice fields, against risks arising from multiple aspects of global change. The overall objective is the elaboration and testing of generally applicable principles within the frame of ecological engineering – an emerging discipline, concerned with design, monitoring and construction of ecosystems. The focus is on local as well as regional land use intensity (including the socio-cultural and economic background) and biodiversity, and the potential impacts of future climate and land use change. LEGATO specifically plans to:

1. investigate the interactions between rice cropping systems, the landscapes in which they are imbedded, and the socio-cultural perceptions and valuation of both the landscapes and the agricultural practices;

2. quantify (incl. the assessment of uncertainty) the current and future dependencies of ecosystem functions (ESF) & services (ESS) of these cropping systems on local & regional land use intensity and its driving forces, biodiversity, climate and socio-economic and cultural drivers/constraints;

3. study three ESF/ESS strands: nutrient cycling & crop production (provisioning service = PS), crop related bio-control & pollination (regulating service = RS), and agricultural landscape related cultural identity & aesthetics (cultural service = CS) and their feedbacks with the driving forces behind pressures resulting from land use intensity;

4. develop valuations and respective integrative indicator sets of the investigated ESF/ESS strands through monetary as well as non-monetary methods, and evaluate their relevance for the provision of the different ESS;

5. test and further improve already existing indicators for ESF/ESS and their values and develop and/or test new ones where appropriate and necessary on intra-, trans- and superregional scales via a cross national comparison;

6. develop an indicator based assessment of risks and opportunities of crop production in the light of ESF/ESS impacted or enhanced through changes in land use intensity, socio-cultural conditions, biodiversity and climate change;

7. develop guidelines for decision makers (incl. farmers) and test their implementation in order to further enhance ESF/ESS provision, in particular through ecological engineering;

8. develop socio-economic analytical frameworks & tools for promotion of advanced land management practices, based on analyses of driving forces & stakeholders (see step 2).

9. build a basic framework for motivating laymen to assist in data gathering on biodiversity data for pest control and support for the assessment of risks and opportunities. The framework on which LEGATO builds consists of organisational structures and the technical backbone to manage citizen science data [2].

According to the research scope of this project, seven regions (15x15 km² each), three in Luzon/Philippines, three in North Vietnam and one in the Mekong delta in South Vietnam were selected basing on results of focus group discussions and interviews with stakeholders.

¹ LEGATO stands for **L**and-use intensity and **E**cological **E**ngineering – **A**ssessment **T**ools for risks and **O**pportunities in irrigated rice based production systems.

Table 1. LEGATO selected sites and codes

LEGATO region (code and name of province)	Land use intensity			Landscape structural diversity			Cultural diversity	
	low	medium	high	low	medium	High	Low	high
Philippines (Luzon island)								
PH_1: Laguna		■	■	■	■	■	■	■
PH_2: Nueva Ecija			■	■	■	■	■	■
PH_3: Ifugao	■	■				■	■	■
Vietnam								
VN_1: Hai Duong		■	■	■	■	■	■	■
VN_2: Vinh Phuc	■	■	■	■	■	■	■	■
VN_3: Sapa	■	■				■	■	■
VN_4: Tien Giang			■	■	■	■	■	■

In the frame work of this project, the natural and social scientist implemented surveys to analysis local characteristics of ecosystem service and cultural identity involving rice cultivation in investigated sites. This is an international consortium of 21 research institutions from 6 countries and 2 international organizations, involving 80 scientist, 250 farmers and 20 further stakeholders [3]. In interdisciplinary projects, each discipline (The academic tribes, Pohl and Hirsch Hadorn, 2008) has its own language and culture and the project result will be combine research outcomes from different disciplines. In additions, the involvement of non – specific expertise (as known stakeholders) with its criteria for ranking results, based on different value systems leading to different judgements even in case of factual agreement: The lesson is that stakeholders hold and express diserve values, often based on different value systems, and request them to be taken into account in decision making [4].

In the last phase (WP 5 – Implementation - Figure 1.), LEGATO project will focus on giving solutions for apply ecological engineering applications, basing on three legs:

(1) the ecological engineering training should enable farmers with the skills to

continue the practice after the end of the project (empowerment), in particular given the economic benefits the approach provides them with

(2) the support of authorities which makes it easier to practice innovative land management methods

(3) the offer of low-level, but still continued support from the scientific partners in the host countries, and in cases of emergency from some of the German partners as well (all without being funded for that).

In there, the second leg on the support of authorities is especially focused in Vietnam. Through combining and strengthening the roles of 03 internal key stakeholders groups (the policy target group – policy implementing group – policy innovation group), the ecological engineering can be conducted following sustainably agricultural development policy, especially in rice cultivation.

* Analyzing 2 policy paradigm

In this paper, we follow the definition by Vu Cao Dam on policy paradigm. It can be shown through analyzing 2 policies which mention or without mention on EE application on the following tables below:

Table 2. Comparative table of 2 policy paradigms

	Paradigm of the policy without EE application (Paradigm 1)	Paradigm of the policy on EE application (Paradigm 2)
Philosophy	Developing rice cultivation focuses on food safety and economic benefits	Developing rice cultivation tends to sustainable development (ensure the relatively balance among food safety, socio-economic benefits ecosystem balance, natural and social landscape)
Conception	* Every steps in rice cultivation activities must be implemented without forecasted and evaluated ecological impacts * Rice cultivation activities can apply any solutions (chemical solutions) in rice cultivation, anyway bring highest benefits in shortest time	* Every steps in rice cultivation activities must be implemented , parallel with forecasting and evaluating ecological impacts * Applying biological control in rice cultivation
Norms	Agriculture development is evaluated by mainly income of rice cultivation increase	The ecosystem is not be influenced according to negative impacts in the areas of rice cultivation
Nortions	Chemical solutions in rice cultivations, environmental conflicts, ...	Ecological engineering, biological control, ...

Through the pilot EE model in investigated places of LEGATO, the preliminary results will provide the practical evidences for policy making process. Following the policy analysis approach, scientists also forecast barriers which make risk or negative impacts in implementing the policy on EE application. The positive impacts of policy on EE application can make social constructions which ensure the sustainable development for local agriculture. This is a result of as definitely transformation from paradigm 1 to paradigm 2 (Table 2.)

3. The role of key internal stakeholder groups² in implementing the policy of ecological engineering application

The paper conducted within LEGATO which combines Natural and Social Science elements, analysing ecosystem properties,

dynamic interactions of ecosystem elements, structures and natural processes, and interactions with anthropogenic influences, positive and negative. Stakeholder groups are core elements of LEGATO project. Unlike other projects, LEGATO started it work with establish the stakeholder network, through the support from key partners, including Institute of Policy and Management (CEPSTA before)³. The role of stakeholders is extended from being information providers and result implementer to be also the key originators of research themes, active participants in the interactive process of project design specification and evaluators of the project results. The paper mostly analyzes the participation of key internal stakeholders in Hai Duong in policy process, which focuses on the policy preparation phase.

In Hai Duong, we emphasize to build and raise the participation of some following stakeholder groups:

² In project publication, these groups were definated are local stakeholders. In this paper, the author focus on internal stakeholder groups.

The defination of "internal stakeholder group" can be distinguished with "local stakeholders group" including the local partners.

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Table 3. List of stakeholder groups⁴

Code	Stakeholder groups
1	Farmers and their families
2	Municipal administrative agents: agricultural officers, extension workers
3	Rice production chain agents: middlemen and traders in charge of drying, cleaning and marketing
4	Higher level administrators: provincial agricultural officers, agricultural administration
5	Local small businesses (taxis, bike rentals, restaurants, hostels)
6	Local larger businesses, subsidiaries of national institutions or enterprises Local administration, tourism department
7	Higher level administration: provincial and national government

Besides the stakeholders involving agricultural activities, the other groups participate into this project are tourism stakeholders who provide accommodation, catering, mobility and guidance services, producing and selling souvenirs (weaving, wood carving) and presenting the local cultural

heritage on shows, festivals, etc. in selected sites. They provide the evidences to evaluate the circumstance of ecosystem services and characteristics of cultural identity in selected sites. Especially, stakeholder participation in the governance of ecosystem services (ESS) is conceptually necessary.

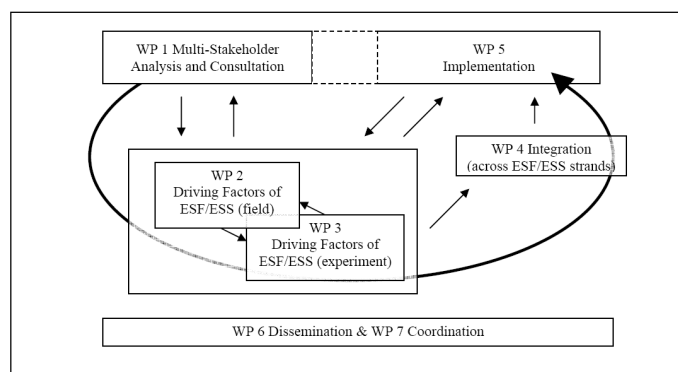


Figure 1. LEGATO overview structure and work flow

⁴ In LEGATO project, stakeholders are detailed with following groups:

- local' citizen or farmers' organizations, councils, etc
- trade unions, work councils, labour representatives
- Churches and religious groups, philosophers
- Environmental NGOs, nature and wildlife protection groups
- Development NGOs and institutions, solidarity movements, Environmental Justice Organizations
- Social organizations: health, homeless and poverty care
- Business representatives of different sectors and levels
- Media people, journalist, news makers
- Administrators, from local to top level, all policy sectors
- Politicians of different parties, sustainability committed
- Women and feminist organization [4]

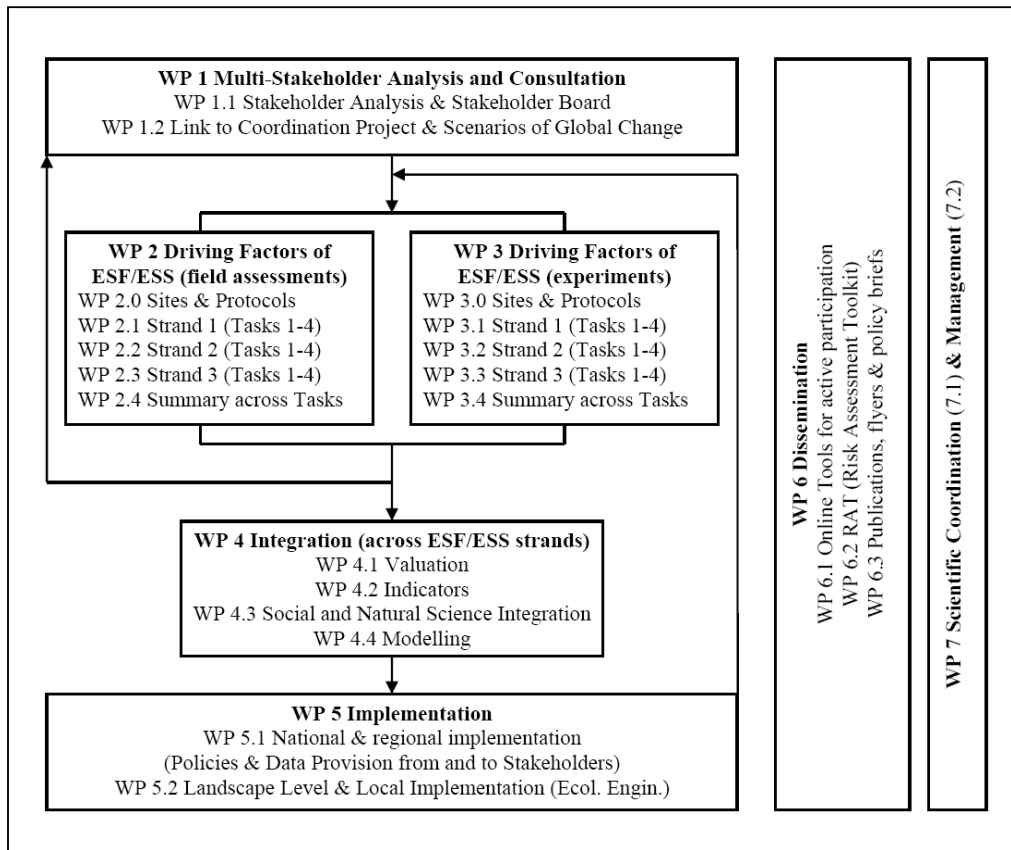


Figure 2. LEGATO detailed structure and work flow
(Task 1: Land use; Task 2: Biodiversity; Task 3: Climate; Task 4: Social system)

The main methods of information extraction stakeholder groups are fit-for purpose of LEGATO:

- Focus discussion groups and interviews have been held with stakeholders of potential investigation sites before the final choice was made, taking socio-economic parameters and gradients into account in choosing the final sites as much as possible

- The interviews with representatives of sites which were not included into the final choice provide welcome material for comparative analysis, while in-depth interviews with individual farmers naturally have to focus on the sites selected.

According policy analysis approach, each policy makes different social reactions. Basically, there are 3 groups: supporting group, opposing group and unrelated group who directly or indirectly make social reactions with policy. In the framework of LEGATO project, it's important to raise the role of local stakeholders in policy making, implementing and evaluating process. Inside, we define that there are 3 key/core stakeholders groups has higher and stronger influences in policy making process on EE application. In policy management, it's important to raise the support of these groups, to make maximize the effectiveness in practice.

Table 4. The matrix on the participation level with rice cultivation development policy making process of internal stakeholder groups in Hai Duong, Sapa and Vinh Phuc

Group Code	Influence of group with policy making process			Potential be impacted by policy decisions			The support for EE application		
	VN_1	VN_2	VN_3	VN_1	VN_2	VN_3	VN_1	VN_2	VN_3
1	M	W	W	H	H	H	H	H	H
2	M	M	M	M	M	M	H	H	H
3	W	W	W	W	W	W	M	M	M
4	H	H	H	M	M	M	H	H	H
5	M	M	M	M	M	M	M	M	H
6	M	M	M	M	M	M	M	M	M
7	H	H	H	H	H	H	H	H	H

Note: W – Weak, H – High, M – Medium, IPAM report, 2015.

The results of analyzing the participation level with rice cultivation development policy making and implementing process of internal stakeholder groups in Hai Duong, Sapa and Vinh Phuc, there are 03 highlight groups in the list of stakeholders in LEGATO project play important roles as followings:

Group 1 - Farmers and their families play an important role in the farming activities in local however the policy participation level is at Weak level in VN_2 and VN_3 and Medium in VN_1, while they are the main target group of agricultural development policy. The level of support for EE application is at High point however they propose supports from authorities about some agricultural incomes such as seeds, fertilizers, etc. Seventy eight percent of them also mentioned that using chemical fertilizer and pesticides, raticide, etc. is more effective than applying biological control. Eighty eight percent of the selected farmers concern about the economic and food security values than other values (including the environmental values). In Kim Thanh county in VN_1, the farmer concerned more about the environmental

values and ecosystem service because they were affected by negative impacts from changing land using aims and environmental conflicts which makes air and water pollutions circumstance in this area.

Therefore, with the Weak level influence with policy making process and support for EE application and the High level impacted by policy decisions, farmers will carry out the EE following the policy decisions instead of applying the EE actively.

Group 4: Higher level administrators: Provincial agricultural officers, agricultural administration

This group has important task in implementing agricultural development policy goals. Ninety eight percent of provincial officers and agricultural administration supposed to use ecological indicators in evaluating the impact of farming development policy. One hundred percent of interviewed agreed to support for EE application process and want to be trained the ecological engineering knowledge. They get High

influences with the policy making process because they directly participate in conducting and evaluating policy in local and they are well informed about natural and socio-economic conditions and indigenous culture. They also understand the need and potential development of local agriculture in investigated places.

Group 7: Higher level administration: provincial and national government

This stakeholder group has high relevance in policy making process and support actively for EE application in local. Besides, they also have high potential be impacted by policy decisions.

The role of internal key stakeholders in policy making and implementing process within LEGATO projects

Group 1: Policy target group will have responsibilities in:

- 1- Applying the EE models in their farming areas as policy goals
- 2- Giving critical information about the EE model in practice
- 3- Maintaining EE application in their farming areas and replicating this model in larger areas + creating the new agricultural cultural identity involving ecosystem balances.
- 4- Participating in evaluating the effects of EE model

Group 4: Policy implementing group will have responsibilities in:

- 1- Ensuring the ecological target can be implemented
- 2- Transferring the EE model for farmers
- 3- Managing and evaluating the policy effects including ecological indicators are well implemented

Group 7: Policy innovation group will have responsibilities in:

- 1- Proposing ecological goals in policy making process
- 2- Brain storming new policies mentioning ecological impacts can be applied suitable with local natural and socio – economic conditions
- 3- Gathering the source to implement policies (internal and external sources)
- 4- Expanding the scope of this policy on EE application

From 2011-2016, with the role of a Vietnamese partner in the North, IPAM implemented more than 20 fieldtrips in Hai Duong, Sapa, Vinh Phuc, 15 surveys/interview and more than 30 meetings with local leaders, 02 pilot training courses on EE application in the frameworks of LEGATO project. The IPAM milestones focus on:

(1) Analyzing data and information about the characteristics of ecological ecosystem and cultural identify conservations in selected sites and their interactions between us, with some following contents: land use impacts on cultural identity & aesthetics , biodiversity relevance for cultural identity & aesthetics, climatic effects on cultural identity & aesthetics, relevance of the social and economic system for cultural identity & aesthetics

(2) Identifying the needs and supports of different stakeholder groups, to find the key solutions to implement EE in investigated places.

(3) Proposing the EE application in policy making process in selected sites in Vietnam, with the support from governmental and local authorities.

Especially, we just focus on making communication network with 3 key internal stakeholder groups and enhancing the linkage among key internal stakeholder groups in implementing ecological engineering, can fit-for-purpose with both of top down and bottom up approaches in policy management process.

Top-down

This approach was applied by experts, officers, managers and policy makers, which resulted in agricultural land use planning (in particular, a planning option for agricultural land use) for the concerned areas.

The advantage of this top-down approach is that priorities of the Government, the collectives and communities are satisfied by the fact that the planning exercise is executed by professional planners, managers and policy makers. Its disadvantage, however, is that the planning option does not satisfy people’s desires and needs, especially those of ethnic minorities living in the allocated agricultural land.

Bottom-up

This approach is usually applied to small areas of land, e.g. land use planning for hamlets/villages, communes, farms or small project areas. The advantage of this approach is that the people’s needs and desires are satisfied. But its disadvantage lies in the limitations of the agricultural land use options, as they are elaborated by the people who usually lack information (for example: market information) and high visibility. In addition, national benefits are sometimes inadequately defined since the ordinary people do not know well the land use requirements at the national level.

4. The improvement of key internal stakeholder groups participation in implementing ecological engineering in Vietnam (case study in Kim Thanh district, Hai Duong province) and further steps in policy making process

Unlike Sapa – developing the traditional rice cultivation mostly provide for food security and starting to connect the agricultural development with ecotourism, Hai Duong is one of the agricultural development areas with high yield of rice in Vietnam. In Hai Duong, there are 126,000 hectares of rice planted area (2014). Average yield is about 6tons/ha/crop, average area is about 400-500m² / person. Main farming methods are still the manual and costly ones. The rice cropping cycle (2 yield per year), the first often starts in February and ends with the harvest in May or June, the second start from July and ends in October. Hai Duong has comfortable conditions for applying EE, with many familiar sources like Tien Giang where conducted successfully. [5]

However, there are some goal conflicts (environment conflicts) happened in implementing the conversion of land-use purpose, especially in Kim Thanh district. The local people expect strongly about a new policy can solve or at least decrease the polluted circumstances and recover natural landscapes and ecosystem balance here. The rice cultivation area tends to reduce scope and rice yield, most of interviewed farmers want their next generations will get other jobs.

Table 5. Policy participation of stakeholder groups

Steps	Policy participation	Participation		
		Policy innovation group	Policy implementing group	Policy target group
	Policy preparation process	- Participating in conducting pilot models and evaluating the results. - Exchanging about the route for EE application - Preparing the necessary sources for application process		

Policy making process	- Proposing the ecological engineering application in policy goals - Making decisions	- Giving more evidences for policy making process	
Policy implementing process	- Operating the application process in general		- Applying the EE
Policy evaluating process		- Evaluating (short and long terms) the negative, positive and side- effects from EE services. - Collecting the feedbacks from other stakeholders groups to adjust policy implementing process	- Giving feedbacks
Policy opponent process			- Giving critical evidences for policy evaluating process
Policy recycling process	- Controlling the demands from diversity groups - Expanding the scope of EE application		

The general route for EE applications of IPAM (2015-2016)

Phase 1: Analyzing the characteristics of rice cultivation in Hai Duong

- Organizing interviews and surveys with stakeholder groups

Phase 2: Conducting the project activities fit-for-purpose for internal key stakeholder groups:

- Proposing about EE application with policy innovation group and implementing group (Carrying out routable- meetings, brainstorming dialogues)

- Coordinating with Vietnam partner (IEBR) to prepare for training course in Hai Duong

- Implementing pilot training courses

Phase 3: Evaluating and brain storming the next steps

- Evaluating the pilot results

- Promoting the EE application plan in the policy making process in Hai Duong

During the implementation of this model, through meetings and surveys implemented in Hai Duong, IPAM also built up the stakeholder network as our tasks in the framework of LEGATO project. In the last phase, IPAM cooperated with other Vietnamese partners to carry out the roadmap of ecological engineering application in Kim Thanh, Hai Duong, with the supports from LEGATO scientists. This roadmap is unified to implement in Kim Thanh, N-Vietnam (VN_1) with the cooperation of Natural and Social scientist in Vietnam. It was also applied for Nueva Ecija, Central Luzon (PH_2) based on characteristics of rice cultivation which were investigated in

Phillipines, basing on the local conditions in here.

In February 2016, IPAM will evaluate the impacts of EE application process in Hai Duong. In the preliminary results, the EE can be continued to apply in Hai Duong, with the support from authorities. Especially, the outputs of LEGATO project can help promote the R&D activities, the rice cultivation development and maintain the ecosystem balance to improve the quality of landscapes in Hai Duong.⁵

⁵ Appendix 1. List of activities 2012-2016 (According to IPAM milestones in the framework of LEGATO project)

No	Contents	IPAM	IEBR
I. Main tasks			
1.	Combining the policy preparation and making process with applying pilot EE model	- Supporting for social evaluations from EE application and promote policy preparation process	- Transferring EE for farmers and sources for application process in local
II. Implementation			
1.	Training course and transferring the techniques	- Identify the farmers who own/manage fields within the 1 ha zone of the 4 test sites - Ensuring the participations of policy implementing group and policy innovation group (Department of Science and Technology, Department of Agriculture and Rural Development, The leaders and extensionist of Thanh nien and Cong hoa Commune attended the training course, representatives of Plant Protection Agency attended the fieldtrip with farmers	- Choose 4 appropriate LEGATO test sites (2 poorly, 2 richly structured); for the planting of flowers - These 4 test sites should be treated the same way, i.e. converted into EE fields with flower strips and should have an area (buffer zone) of at least 1 ha (10,000m ²) around them which are not treated with pesticides, while the flowering areas should be in the centre of this 1 ha ⁶ . - The remaining 6 sites should serve as control (if possible; sites which are not rice fields any longer cannot be included) - Include instructions which plants to plant on the bunds right now and show how these should be planted. - Concerning the plant selection it would be good to have similar ones in VN - Do the actual planting: a total of 200m ² with flower strips along the LEGATO sites should be planted; this could and should be done with some gaps between the different flower areas, - - Include instructions for farmers regarding some key indicator species, teaching them to recognize, to observe and monitor these species ⁷
2.	Holding the communication network	IPAM will holding the communication networks: * The policy implementing group: support for	- Repeat interviews regarding plans and expectations, 10-14 days after the course to give time

⁶ For VN1R3 this is particularly important as it is in the middle of a larger rice field area; VN1R4, VN1R5 and VN1R6 are more marginally situated and thus it should be easier to achieve the avoidance of pesticide use as fewer farmers should do farming within the area.

⁷ this refers to the training of farmers and could include indicator insects as well as plants (e.g. including the “good guy/bad guy” distinction in relation to invasive species)

	<p>the ecological engineering application (Plant Protection Agency directly) and Department of S&T and Department of Agricultural and Rural Development</p> <p>* The policy innovation group: 02 people/commune</p> <p><i>Details:</i> 1-2 times per month, project staff will visit the rice field and check the status of the selected site and difficulties of farmer in applying the ecological engineering. The list of questions will be sent to the scientists for answering and feed back for local people.</p>	<p>for the information to “sink in”, to identify needs for additional support and evaluate the training impacts</p> <p>- Organize/support exchange of experience of those involved in the test sites, and field visits by training participants from outside the test sites to illustrate measures taken and their impacts (with expert company)</p> <p>- After harvesting, have a series of evaluation interviews to assess the results (yield, expectations met or not, preparation of second season) and prepare for the next season.</p>
3. Evaluating tasks	<p><i>Crop 1:</i> <i>Pre-training (20-21/4):</i> IPAM carried out the interview with farmers and local stakeholders (double check with the list of IEBR): Interview before the training course (about past management (input volumes and frequency, crops, yields...) and present expectations (especially avoidance of pesticide used for the duration of the study, i.e. for the next 3 cropping seasons⁸). <i>Midterm interview: 2 weeks/time</i> Analysis difficulties/ supervise the application process Support for farmers in case of insects/ diseases attach rice fields <i>Last-term interview</i> Assess the impacts and the demand for next training course in next crop <i>Crop 2:</i> (Duplicate the interviews and in the last term, evaluate the impacts and effectiveness after 1 year)</p>	<p>- Evaluating the EE application in rice cultivation in investigated sites, through analyzing impacts from this model in Hai Duong.</p>

Conclusion

The paper focuses on analyzing the highlight role of 03 internal stakeholder groups such as: policy target group, policy implementing group and policy innovation groups. This triple helix can ensure for EE

application in investigated places. Besides, it can reduce the risks through the frequently interactions (feedbacks) among these group in the policy cycle. In Sapa, the linkage is strengthened with the support of tourism stakeholder, in order to develop the EE follow the way of combining the agricultural development and ecotourism. In this paper, author points out the important roles of 3 internal stakeholder groups and analysis different level of policy participation (preparing

⁸ Farmers just started to spray the rice fields heavily now around 8th April 2015; it is questionable if this rather late spraying activities is justified or if spraying is just happening without knowing what should be sprayed when.

– making – implementing – evaluating – opponent – recycling process) of these stakeholder groups. The policy analysis approach provides the clearly identification about the key objects (based on the analysis of their positions, viewpoints on rice cultivation development, awareness of cultural and traditional cultivating preservation, etc.). The two – sides approach: top down – bottom up also help to reduce the information interference and loss in policy operating process.

In Vietnam, there are some national programs were implemented as the interdisciplinary project. Decision 79/2005 / QDD - TTg of the Prime Minister to the economic development of socio – Northwest is one of these. This program contain strategic targets tend for local development including the rice cultivation and ecotourism. It also finds out the role of local stakeholders (local governance) with the approach: bottom – up. After 10 years of implementing, its mission not yet “live” in life, just “to be in sky”, caused by nonconformity between a huge of targets number with the wrong approach (one side approach). The experiences of LEGATO in deploying interdisciplinary researches which apply in Vietnam, according to policy analysis approach, can give useful lessons in exploiting the role of stakeholders in policy participation, to increase positive policy effects in sustainable regional or interregional development in Vietnam. The highlight point is that there are many local policies make conflict which can be

solved by EE application. The role of policy implementing and innovation groups is overcoming “the gap” in policy making process, reduce the policy conflicts between policies in agricultural development to each other and with other policies in other fields, based on the existing local conditions. To push the policy analysis approach, scientist will play a role in providing the theories and practice evidences for different steps in policy cycle.

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Tiếp cận phân tích chính sách trong triển khai công nghệ sinh thái ở Việt Nam: Kinh nghiệm từ LEGATO - một dự án liên ngành

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Tóm tắt: Bài viết đánh giá tiềm năng tham gia của các bên liên quan từ cách tiếp cận chính sách khi áp dụng các công nghệ sinh thái. Trọng tâm ở đây là phân tích các nhu cầu của việc tăng cường mối liên kết bền vững giữa các nhóm thụ hưởng chính sách - nhóm thực hiện chính sách - nhóm đối mới chính sách là giải pháp phù hợp nhất để xây dựng các ứng dụng công nghệ sinh thái trồng lúa ở Việt Nam. Không giống như các dự án khác, các kết quả đầu ra đa dạng và kết quả của Legato có thể cung cấp một nguồn dữ liệu cần thiết rất lớn từ các nghiên cứu liên ngành về điều kiện áp dụng công nghệ sinh thái trong thực tế. Thông qua phương pháp phân tích chính sách, các tác giả xác định lộ trình cho quá trình chuẩn bị chính sách khi áp dụng các công nghệ sinh thái trong dự án Legato tại huyện Kim Thành, tỉnh Hải Dương, Việt Nam.

Bài viết có ba nội dung cụ thể như sau: (1) Giới thiệu về Legato - một dự án liên ngành, (2) Phân tích tiếp cận chính sách trong việc thực hiện dự án Legato (3) Phân tích vai trò của các nhóm liên quan nội bộ quan trọng trong việc thực hiện các chính sách của ứng dụng công nghệ sinh thái, và (4) Nâng cao sự tham dự nội bộ của các nhóm liên quan quan trọng trong việc thực hiện công nghệ sinh thái ở Việt Nam (Nghiên cứu trường hợp ở huyện Kim Thành, tỉnh Hải Dương) và các bước tiếp theo trong quá trình hoạch định chính sách.

Từ khóa: nghiên cứu liên ngành, công nghệ sinh thái, cách tiếp cận phân tích chính sách, các bên liên quan.

APPENDIX 1. LIST OF ACTIVITIES 2012-2016

(According to IPAM milestones in the framework of LEGATO project)

1. Available interview data on results of stakeholder consultations to feed into LEGATO research in 2012 (Milestone 2)

No.	Detailed activities	Time	Location	Stakeholder
1	Meeting with Provincial Department of Culture, Sport and Tourism	13/01	Block IV – Newly urbanized zone, Lao Cai	Head, Division of Planning and General Affair - Officers, Division of Tourism Management - Officers, Division of Tourism Programming
2	Meetings with Agency for Plant Protection		Block VIII - Newly urbanized zone, Lao Cai	- Mr. Hùng, Head of Branch Office of Plant Protection - Head of Technical Office of the Agency for Plant Protection Meetings with some officers of Provincial Department of Agriculture
3	Focus group discussions and in-depth interviews with farmers	14/01	Trung Chải commune	
4	Interview		The Tourism Information Center	
5	In depth interviews with rice trader	15/01	Market	Rice traders, Millers
			Mr. Sần Cháng's house, Tả Văn Giáy	Depart to Tả Văn Giáy Focus group discussion with farmers
			Tả Văn Giáy Commune	In depth interviews with leader of Tả Văn Giáy Commune Visit of rice terraces view point
			Family Museum, Tả Văn Giáy	In depth interviews with tourism trader
			Hoang Gia I Hotel, Sapa	In depth interviews with tourism manager
6	Focus group discussions and in-depth interviews	16/01		Director of Lao Cai Provincial of Department of Culture, Sport and Tourism Staffs

2. Available interview data on Cultural ESS Cultural identity & landscape aesthetics in 2013

Carrying out the fieldtrip about identifying the ecological approach in developing agriculture and land using management, with some following contents:

➤ *Land Use Impacts on Cultural Identity & Aesthetics*

➤ *Task: Biodiversity Relevance for Cultural Identity & Aesthetics*

➤ *Task: Climatic Effects on Cultural Identity & Aesthetics*

Task: Relevance of the Social and Economic System for Cultural Identity & Aesthetics

No.	Detailed activities	Time	Location	Content
1	Meeting	03/04	Hai Duong city	With representatives of Hai Duong Provincial Department of Agriculture and Rural Development
2	Meeting	04/04	Nam Sách District, Kim Thanh District	With representatives of Plant Protection Agency in Hai Duong Focus Group Discussion with farmers
3	Focus Group Discussion in Ngoc Thanh Commune	05/04		Farmers
4	Depth – interview with local leaders	15/05	At Mr. Lò Diều Phủ's house Trung Chải	
5	Meetings		Block IV – Newly urbanized zone Lao Cai	- Provincial Department of Culture, Sport and Tourism - Head, Division of Planning and General Affair - Officers, Division of Tourism Management - Officers, Division of Tourism Programming
			Block VIII - Newly urbanized zone, Lao Cai	Meeting with Agency for Plant Protection: - Head of Branch Office of Plant Protection - Head of Technical Office of the Agency for Plant Protection Meetings with some officers of Provincial Department of Agriculture
6	In depth interviews with rice trader	18/05	Market	
7	Meeting		113 Tran Hung Dao Str., Hai Duong City	+ Provincial Department of Agriculture and Rural Development in Hai Duong Province + Agency for Plant Protection in Hai Duong + Agency of Planning
8	In depth interviews Visit of rice field		Nam Sach, Hai Duong	With farmers
9	In depth interviews		Huu Nghi Hotel, Hai Duong	With tourism manager
10	In depth interviews Visit of rice field	19/05	Nam Dong, Hai Duong	With farmers
11	In depth interviews Visit of rice field		Chi Linh, Hai Duong	With farmers
12	In depth interviews	20/05	Kim Thanh,	With farmers

	Visit of rice field		Hai Duong	
13	In depth interviews with farmers	21/05	in Ngoc Thanh Commune, Vinh Phuc Province	
14				Taking photo about land use in Vinh Phuc (Waterbodies, forest, meadow/grassland, highly sealed surface, low sealed surface, fruit plantations, irrigatedrice, vegetable plantation, agricultural land, eisure facilities, wetland, bare areas)
15	In depth interviews			With local leader Representatives of Plan Protection Agency Vice head of Ngoc Thanh Commune, Vinh Phuc Province

3. Available interview data on Stakeholder feedback to prototype indicator framework in 2014

No.	Detailed activities	Time	Location	Content
1	Interview	5/11-12/12	Sapa, Hai Duong and Vinh Phuc (Milestone 7)	<ul style="list-style-type: none"> - Designing the questionnaire evaluate the indicator development in 03 places in Hai Duong, Sapa, Vinh Phuc - The content of report focus on Analyzing the interference factors to the LEGATO indicator framework: some feedbacks from stakeholders (Milestone 7) - The results of interview is very useful, providing data for IPAM's report on the evaluating changes and challenges in applying the ecological engineering in investigated places of LEGATO project

4. Available interview data on Evaluation about ecological engineering application in 2014-2016

No.	Detailed activities	Time	Location	Content
1	Carrying out the indepth interview with farmers and agricultural staffs in Tien Giang	20-21/01	Tan Phuoc commune Tien Giang Province	<ul style="list-style-type: none"> - The content of questionnaire involving with the report on evaluating the advantages and disadvantages in applying ecological engineering in rice fields. - Collecting at least 25 feedbacks from local staff and local farmers who are applying or not yet do it in Tien Giang province They are not only share their experiences but also give advices for North farmers
2	Roundtable meeting	January and February	Hai Duong Province	- Presenting the LEGATO introduction and its missions.

				<ul style="list-style-type: none"> - Discussing on the authorization for EE implementing in Hai Duong (pilot) - The role of stakeholders - The route of policy preparation which mention on EE application in larger scope.
3	Interview and pilot training course	09-10/02	Nam Sach, Hai Duong Province	<ul style="list-style-type: none"> - Training for local farmers - Guiding the EE application steps
4	Interview and pilot training course	April	Kim Thanh, Hai Duong Province	<ul style="list-style-type: none"> - Unifying the way to managing EE communication network