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Indonesia

Sustainable Business Innovation to Win the Competition A Case Study of Innovation by Wayan in Bullfrog Farming in Bali

“..... Wayan, I could see your talent in this business, you need to keep focus and improve the business so it will become big...”

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Innovation is the essence of business survival. Without innovation, there is no business that can survive to compete for the future. Innovation is not only for the large business or in the high-tech sectors, but also for the small business such as bullfrog farming in agribusiness sector.

Mr. Wayan as a frog farmer is a good example of a very tough and perseverance frog farmer who always take the obstacle as a challenge to make better innovation. This what made his different than the others farmer. As the result, Mr Wayan now has exist as frog farmer for more than a half of his age and become the biggest frog farmer in Bali Indonesia. Many innovations have been done, including batteray pond, frog food, how to handle frog dissesas, methods of making frog grow optimally, until build network to sell the frog. All of his innovation idea came from love and patience in the frog business. He give many ideas for developing good bullfrog farm. Last but not



least, this business innovation is a key for Wayan Success in the frog farming.

Background of The Study

Frogs can be found in many countries in the world, either in subtropical countries which have 4 seasons or in tropical countries with 2 seasons. Frogs are Anura ordo, those amphibians without tail. In this ordo, there are more than 250 genus and 2600 species. There are 4 species of frogs, originally from Indonesia, which are normally consumed : (1) *Rana Macrodon* (Giant Asian River frog), (2) *Rana Cancrivora* (crab-eating frogs) , (3) *Rana Limnocharis* (asian grass-frog), (4) *Rana Musholini* (giant frogs/ Frogs rocks) (<http://www.iptek.net.id>). From those 4 species, frogs rocks are the biggest species which is more than 1.5 kg and the length is more than 22 cm. The most tasty frogs are Asian-grass frogs, although they are only 8 cm long.

Bull frogs (*Rana catesbeiana*) are not originally from Indonesia, it was first imported from North America and Taiwan around 1980. This kind of frogs apparently have some superiority such as easy to adapt, bigger size, grow fast, do not depend on natural food and have more protein than local frogs. (<http://binaukm.com>). Bull frogs have 19.76% protein, 0.63% fat, 75.65% water and 2.36% ashes. Other frogs have 15.23% protein, 0.59% fat, 80.59% water and 3.38% ashes.

In 1974 – 1978, Indonesia was the third biggest country which exported frogs after India and Bangladesh. In 1979, Indonesia even became the second biggest country which exported frogs to Europe, it was around 34% of the total (<http://binaukm.com>). Those frogs were the ones caught from the nature. In 1985, India forbid exporting frogs because it would affect the ecosystem, it also happened in Indonesia. This policy opened to new opportunity for frogs farming. It was first started at BBAT Sukabumi and other cities in Indonesia also did the same after that.

Frogs farming has been done in France, the Netherlands, Belgium, USA and Mexico. In Asia, frogs farming has been done in China, Bangladesh, Turkey, India, Hongkong and Indonesia. Frogs farming in Indonesia has been done in Central Java, East Java, West Java (mainly in the coast of Java island), West Sumatra and Bali.

Nurturing bullfrog in a farm required some adjustment. This is because the habitat difference. Frogs need to be placed in ponds, for easy feeding, monitoring and harvesting. This adjustment provide a challenge for farmer to make continuous innovation in order to maintain quantity and production continuity.



Innovation need to be done, since the market demand is quiet promising. From the interview with the major supplier, we found that most of the frog demand has not been fulfill. The main cause of this is farmers' lack of innovation when they faced various problems. Many farmers gave up and choose another business since they can not make continous innovation. Mr Wayan is a good example of how a farmer can overcome various problem in bullfrog farming by innovate continuously.

The Business

Bullfrog farming is promising business. Weather local demand or global demand has not been fulfill yet. Bali's demand for Bullfrog is 2 tons/month, while Jakarta is around 5 tons/month. From international market, Singapore has the highest demand for bullfrog. The demands reach 10 tons per week, usually supplied from Thailand and Malaysia.

Not many farmers are willing to run this business. Many argumentation has been given, including small demand, frog are difficult animal to breed, lack of capital, and many other reasons. This somewhat surprising, given many support and effort has been done by government.

Bullfrog business has good profit, as long as it run effective and efficiently. Frogs are disease-resistant animal. As long as they have enough water and food the growth will be optimal. The profit is above 38,7%, with minimum space required, so overall this is a promising business.

Creativity is needed in this business otherwise the farmer cannot compete and the move forward. Besides that, creativity is also needed to solve any problems which come in the business process. Many innovations are needed to improve bull-frogs farming, this should be realized by anyone who interest in bullfrog farming.

The History of Mr. Wayan's Bull Frogs Business

Mr. Wayan is originally from Bali and is married to Ni Wayan Nyuadi. He has 2 children. The first child is a daughter, Ni Luh Putuwida Ningsih and the second child is a son, I Made Wida Adiputra. The business in frogs farming is able to support in raising the two children and send them to school. The children have married and have their own family, they work in cruise ship with the salary of Rp. 30



million/month. One day, Mr.Wayan hopes that if he retires, his frogs farming business can be done by his son.



Figure 1
Mr.Wayan's Family

At the beginning, Mr.Wayan worked as a tailor, with a small stall in traditional market. He lives in Jegu, a small village which most of the inhabitant work as teacher. His wife was also the teacher in elementary school teaching Bahasa Indonesia. Their life was very simple with mediocre income. The salary of making shirts was Rp500-600/piece, or around Rp. 50.000 per month, while Mrs. Wayan has income around Rp. 75.000/month.

At the beginning, Mr.Wayan bought 25 tadpoles from Mr Suatra. Since Mr Wayan do not have enough money to pay in cash he paid the tadpoles by payment delay. Everytime he took 3 tadpoles, he paid 2 tadpoles first. The price is quiet expensive for Mr Wayan, as comparison, for buying 25 those tadpoles, he had to finished 12 clothes as tailor.

He put those tadpoles in the pond in front of the house, and didn't tell his wife. He was afraid that she would be angry and didn't agree. However, at the end, She found out about it. This was because the tadpoles were grown up and become frogs, so they start making noise. Around 10 pm every night, there's always the sound of frogs, until one day, his wife asked, "What kind of sound is it? It sounds like bull in the night?"

The partnership between Mr Wayan and Mr Suatra went well until one day the government heard about it. Fortunately, government in Bali gives supports to the



business. Mr. Ida Bagus Mantra, the governor in Bali at that time, give order to Fishery Department to prioritize the bullfrog farmer in Jegu and made those village as center of bullfrog farming. At that time Jegu was very small village with lack of infrastructure, many roads in Jegu were still macadam road. To achieve this target the governor wanted to decrease the price of tadpole, so many farmer able to buy it. The target price was Rp. 1000/tadpole, and slowly the price of the frogs will also decrease. When the price of tadpoles decrease, Mr.Wayan bought 100 more tadpoles with price of Rp.1000/tadpole.

The ambition to make Jegu as center of bullfrog farming was decribed in the statement of Mr. Ida Bagus Mantra, “..... Jegu Tabanan village must be able to become the center of frogs farming in Bali...” Support was provided in the form of 7 ready-made ponds distributed to farmers. There were 45 farmers, coordinated by Mr.Wayan, so total ponds distributed were 315 ponds (45 x 7 ponds). Mr. Ida Bagus Mantra suggest Mr. Suatra to form farmer union, and keep decreasing the tadpole’s price. Other support provided by the government was a soft loan amounting of Rp.7,000,000 in 1981. Using this loan Mr. Suatra expand the field for his frogs farming and bought 45 m² land area in Raya Air Panas, with the price of Rp. 3,000,000.

Mr.Wayan bought seeds of frog from Mr.Ketut Suatre, the payment could be in installment from the result of his tailor business. He took Rp.500 each day from the result of tailor business for his family, together with the income from his wife as a teacher. This is the initial milestone of Mr. Wayan in frogs farming business.

The Key Decision Points

Mr Wayan work previously as a tailor. One day, Mr Ketut Suatra, one of the Mr.Wayan’s friend introduced him to a bullfrog farming business. Mr Suatra bought tadpoles with the price Rp.5000/tadpole and persuaded Mr Wayan to join the business. At that time, Mr.Wayan was still thinking about buying those tadpoles. Mr Suatra told Mr.Wayan, “Wayan.... Why do you keep working as a tailor? Why don’t you join me to run bullfrog farming business?” Since then, he felt interested and decide to do business in frogs farming.

While pioneering business in frogs farming, Mr.Wayan still worked as a tailor and freelance photographer. He also had business in making souvenirs from wood/coconut tree in 2001, and only last for 3 years. At that time bullfrog farming



was not Mr Wayan major concern, he was still unsure whether this business could support his family. Therefore, he was still doing other business.

The souvenirs business ended when there was a bomb blast in Bali, impacting many aspects of tourism business, including the souvenirs demand. The business went bankrupt leaving the debt of 30,000,000 and the workers needed to be laid off. This condition also impacted the frogs farming business. Mr. Wayan put his focus again in frogs farming business and sold those frogs which are left. The money was used to pay the souvenir business debt. This was the turning point for Mr. Wayan, he decided to focus on frogs farming business.

It was such an experience for him and suddenly he remembered his friends' from America and Belgium that gave him advice to keep focus on frogs farming business. "..... Wayan, I could see your talent in this business, you need to keep focus and improve the business so it will be big...", they said. Finally, his friends' advice turned out to be true, especially after Mr. Wayan lost a lot of money and almost bankrupt. After that he made a decision to focus only on bullfrog farming.

This decision was based on awareness that he was not gifted to be a trader, however he found his passion in bullfrog farming. Instead of doing many things that do not focus, he started to manage the bullfrog farming business systematically.

Controversial Issues

One of the controversy issues in bullfrog farming is the release from Indonesian Ulama Council (MUI). Though there is still a different point of view in concluding whether frog is allowed to be consumed or not, but Muslims in Indonesia tend to avoid consuming it. The impact is people also has reluctant in bullfrog farming, and this condition also impacts financing institution. Farmers are difficult to obtain funding from any financial institution because they still questioning about business future.

The other issue are about the characteristics of Bali farmers. They tend to avoid investing and passively waiting for assistance. Meanwhile they have less passion in this business and tend to rush harvesting the frog. The frog has not reach ideal size, so the price is low. "The Bali farmer do not have enough courage to make some investment, they tend to wait for government assistance. On the other side, the farmers have no patience and perseverance in bullfrog farming, result in rush



harvesting and size mismatch. Market cannot accept their frogs, and slowly they leave this business”.

Challenge and Barrier

These frogs were originally came from Taiwan and South America, developed by BBAT (Balai Besar Pengembangan Budidaya Air Tawar) at Sukabumi. This frog known have some superior traits compare to local one such as more docile, adaptable, and bigger size. At the first, BBAT was proposing “superior frogs” as the frog’s name, but some of Mr. Wayan’s friends in Java prefer to call it “bull frogs”, referring the sound that heard like bellowing bull. This name was immediately approved by all farmers, and since then the frog is known as the Bullfrog.

Bull frogs characteristically much more calm and docile than the local frogs. This differences led to the difficulties of interbreeding between bullfrog and local one. Mr Kardim from UI had done research in 1988 – 1990, tried to interbreed the bullfrog and local frog. However, the result was not as expected. Local frogs tend to be wild, jump and run. Many of them ran away and died. Until now, there is no successful result reported in interbreed between these frogs.

Basically frogs lifecycle through three stages, which are tadpoles stage, small frog, and mature frog. This give challenges to farmers to find suitable ponds for each lifecycle. From process of hybridization until the tadpoles become one-month old, frogs need special treatment. The environment should be quiet and spacey, and after fertilization the egg should be separated from their parent. The other barrier is to determine the sex of the frog and when they are ready to be paired.

At this stage the eggs do not need food, but after 4-7 days, eggs become larvae and they need food. In nature their food are wigglers, but to provide wigglers continuously is impossible. Farmer need to think creatively for substitute food.

When the tadpoles reach one-month old, they need natural habitat. Natural food needed to support optimum growth. Tadpoles also need space to swim so their muscle become strong. At this stage they also need to be protected against predators.

After 4 months, tadpoles change into small frog where they tend to have less active. The main challenge in this stage is how to grow the small frog optimally so they reach standard size. In the market there is special food for frog, but the price is quiet high.



Comparing to other animal food, the frog's food has the highest price. This will result in lowering profit of the farmers.

Innovation

First the farmer must determine the gender and examine the frog's readiness to mate. The male frogs have green color with yellow spotted and the skin a little bit rough, with the ears sticking out. Female frogs are dark green, smoother skin and the ears are flat. The process of frogs breeding will be explain as follow.



Male

Female

Figure 2
The Difference Between Male and Female Frogs.





Figure 3
Checking The Libido of Male Frogs.

To check the readiness of frogs pairing, the farmers need to know whether the male frog has entered a period of lust. The libido of male frogs checked by rubbing the male frogs' chest and feel the grip. The stronger the grip, the higher the libido. When the grip is strong enough than the frogs are ready to mated and they can be put in the hatchery pond. The water used should be sterile or using tap water from PDAM (local public company which provide clean water).The pond must be seal from any disturbance or noise.

Fertilization usually done in one or two nights, and produces around 20,000 eggs. The probability of surviving eggs is 50%, and they will be covered by mucus for 2 days. Mucus will be off on the 3rd or 4th day and the eggs become larva which are marked by the extension of black dot. It takes around 4 to 7 days for larva to become tadpoles (marked by appearance of head and tail).

At this stage, the food given is egg yolk, usually 2 times in a day. This is also one of Mr. Wayan innovation. He found that egg yolk is the best food (in terms of growth and cost). The feeding should refer to the number of the surviving larva. If the number of the surviving larva is more than 75%, food given need to be added. At the opposite side when the number of the surviving larva is small (below 50%), the needs for food will be less. This is happened because the eggs that failed to develop will become food for surviving larva.

After 7 days, tadpoles are given food made of fish which is smoothen, it is for stimulating the growth and improve the quality. This also one of Mr. Wayan innovation. Those are happened in hatchery ponds.

After one-month old, tadpoles are moved to field ponds and began to be fed 782 concentrate (from charoen pokphan) until they become small frogs. There are internal and external reason for using the field ponds. The internal reason is related to the limitation of Mr.Wayan's house, meanwhile he has rice field area of 10 acres which can be used for hatchery pond. The external reason is connected to the field habitat which is suitable for growing tadpoles to small frogs. Fields provide many natural food needed, such as plankton and mosquitoes, but also has disadvantage such as existence of natural predator.



Figure 4
Tadpoles in Field Ponds

After they become small frogs which are 4-month old, they are moved to battery ponds at Mr Wayan house until they are ready to be sold. The price of 1 pair of productive frogs to be hybrid can be Rp. 2,000,000 but the parents are not sold by Mr.Wayan.

Innovation in Frogs Ponds

One of Mr Wayan innovation is dividing the ponds based on frog's lifecycle. Basically, there are 3 types of ponds in frogs farming; hatchery ponds, rice field ponds, and battery ponds. As explain before process of hybridization until the tadpoles become one-month old take place in hatchery ponds. After that, they moved to the "rice field ponds" until of 3-4 months and changed into small frog. After 4-month old, they are moved to the battery ponds for intensive growing until they reach ideal size and ready to be consumed in 3 – 4 months.

At first Wayan face problem when the tadpoles become frogs. They tend to jump, and escaping from the ponds. As a farmer, this condition make him apprehensive and cannot focus on his job as a tailor so he give most of the job to other workers. His mind was restless, wondering of how to make good, cheap cage for the frogs and maximizing the land he had.

Then, when he met duck herding farmer who use bamboo to control the ducks, the idea comes. He bought 17 meters in Tabanan, tied them up and brought home to make cage for the frogs. The price of bamboo was Rp. 20/meter. Though it seems like good idea, but at the end it turn to be not effective and efficient. The frogs could still jump over the fence, so Wayan bought another 2 meters bamboo. This incident



keep repeating, until he was forced to buy another 4 meters bamboo. The fence was very tall and looked like cemetery, frightening his wife.



Figure 5
Battery ponds Using Safety Net to Prevent The Frog Escape



Figure 6
Pairing Ponds Protected By Shield



Fail in making fence at the ponds do not make Wayan gave up. He kept thinking about the effective and efficient way to make ponds for the frogs. In total Mr. Wayan had tried 10 times to find ideal pond, but the result still not satisfied.

One day, Mr Abidin, the head of small region (Lurah) in Banyuwangi made big order. He purchased more than ten thousands tadpoles. The payment was not in cash, but barter with 10 sacks of cements. The price of 1 sacks was Rp. 1,700 which barter with 6,000 tadpoles. From here Wayan got chance to build more permanent ponds, but he still has to find the ideal design.



Figure 7
A Pair of Frog in Pairing Pond

The need to expand the ponds was urgent since the number of the frogs keep increasing. In 2000, Wayan finally found the pond system which he called battery system. He divide area into many small square ponds. Every pond could hold 50 frogs.

For breeding, only the pair that has strong lust were selected. Those pair frogs were put in pairing pond for one week and seal from any disturbance. After a week, they could be separated.

Three ponds were needed in breeding process. one pond for pairing, two ponds for separating male and female after hybridization. The pond for hybridization was 1m x 1m and it should be located in quiet area, no noise and sealed with bamboo, so the frogs could not get out.



Figure 9
Battery Pond System

After the process of fertilization, and the tadpoles has grown up into frogs, they should be sorted based on their size. This could prevent cannibalism, which is the big one usually ate the small one. Cannibalism could kill both frogs, because the prey will stuck and make breathing problem to predator.

The battery pond sized 1mx1m and filled with appropriate level of water, it will only submerged the frog, not drawn them. Too much water will make the frogs become wild, unable to reach desirable weight and result in poor quality. Too much water also make the food drawn quickly and wasted.

The pond must be kept clean in order to maintain frog quality. The pond is get dirty easily and needs to be cleaned everyday. Dirty pond could cause frogs mortality or disease, because the rotten food would make water a good media for harmful bacteria. In every pond there is water tab and the height of the water is adjusted according to frog size.





Figure 9
Rice Field Pond

Because frogs are amphibians, they should be protected from sun heats and rain, so ponds need to have roof. This roof also allow workers to feed during rainy season. At the beginning, the roofs are made of coconut leaves. As a result, it has to be changed 2 times in a year. With the help of Fishery Department, the roofs are made of concrete. They are stronger and do not need to be changed.

In every pond, at the top corner there is bending metal, preventing the frogs to escape. There is also drainage system consist of small water tap at the bottom of the ponds, connected each other so the pond can be drained in short time. Wayan found this system based on experience.



Figure 10
The Drainage System in Battery Pond



Figure 11
The Bended Metal is For Preventing Frogs From Escaping Out of The Pond

The continuous effort to find appropriate Food for The Frogs.

One of the innovative effort of Wayan is to find appropriate food for the frog. From tadpoles to frog, this animal should be given different food. From larva to tadpoles



he found that egg yolk is the best food, and for small frog he use smoothen fish. But most of all, the biggest problem was to find appropriate food in the growing stage. Young frog need high protein food to grow in appropriate size.

From his experience, he found that snail is the best food for growing the frog. The natural ingredients has the best result in growing frog (good size and healthy frog). At the beginning he collected snails by himself using the soap pot. In Indonesia snails are easy to find during rainy season, whether at the backyard or near the trash. Nevertheless, the number of the frogs increase rapidly, so he has to find creative way in collecting snails.



Figure 13
The Best Food For The Bullfrog:
The Snail

When frog business began to develop Wayan get larger income from selling the frog, rather than become a tailor. In one week, he could get Rp. 200,000 from selling the frogs, while his wife salary is only Rp. 75,000/month and the average monthly income as a tailor is only Rp. 50,000. This give him happiness and hope, but also raising new challenge.

The challenge now is to get enough snails for the frogs in efficient and effective way . Wayan got a good idea. He take opportunity from his other job as photographer. As photographer he goes from one school to another, and with the help of his wife as teacher, he barter the cost of photograph with 1 pot of snails. At that time Wayan ran the photography business with 3 people. There were 56 Elementary schools and 36 high school (SMK) in 1983. This effort was greeted with enthusiasm by the students, because it is easy to find snails and they do not have to spend money for photograph.



Beside bartering, Wayan also bought snails from students. He offer Rp. 5/pail of snails. This offer was well receive by the students, because they could buy additional food, such as Rujak (the price of rujak was Rp. 1). With this method, Wayan collected almost 1 ton of snails, enough for feeding the frogs. To prepare the frog's food, the snails cut into small pieces and mix with bran.

As time goes by, the snails are getting rare, so Wayan has to find another suitable food for feeding his frogs. While searching in the market, he found out that the food for frogs has the highest price. This can cause the cost of production increase and can reduce the profit. The challenge here is to find substitute food which contain ingredients that support the optimal development of the frogs, especially for the protein.



Figure 14
Feeding The Frogs

Wayan tried to find other kinds of food for the frogs by travelling to milkfish farming in Singaraja. One day, he managed to get the sample of food for milkfish and brought it home to give it to frogs. The result is very satisfying, the frogs grow optimally. Other advantages of using milkfish food is the frogs are stronger and less affected by diseases such as gastric stomach, weak swollen legs and wounded skin. Wayan decide to change from snails to milkfish food.



Figure 15
782 Concentrate Food

Many innovations have been done by Mr. Wayan and he still has the spirit to keep making innovation. The simple valuable thought of him “..... it is only needed 10 farmers who seriously want to focus on frogs farming in Bali, then all demands in bull frogs could be fulfilled and all farmers will get the benefits as farmers...” Spirit and strong commitment are needed as farmers, because from that commitment there will be way to develop frogs farming.

Business Model

Bull-frogs farming has good prospects in finance. The capital needed is not too big and with the proper operation, the profit will be a lot. The calculation in financial aspect of bull frogs farming business is : the cost is for 5000 frogs, because at that point, the economic scale would be sufficient enough.

Time

1000 frogs need operational time 2 hours/day.

4000 – 5000 frogs need operational time 8 – 10 hours/day.

The component of production cost

1. Manpower (8 – 10 hours/day)

Regional minimum wages : Rp. 90,000/month. It takes 4 months to grow up small frogs, so the cost for the manpower will be : Rp. 900,000 x 4 = Rp. 3,600,000.



2. The cost of purchasing small frogs

The price of small frogs is Rp. 2,000/frogs

For 5,000 small frogs need the capital : Rp. 2,000 x 5,000 = Rp. 10,000,000

3. The cost of the food

The cost of the food for 1 frog per day is Rp. 8/frog/day.

Therefore, the cost of food for 5,000 small frogs for 4 months is :

Rp. 8 x 5,000 x 120 = Rp. 4,800,000.

The estimation of frogs died is 1,000 frogs, so from those 5,000 small frogs 4,000 will grow become frogs and ready to be sold. If the frogs grow and reach the size of 4 (1 kg consist of 4 frogs), so 4,000 frogs will be 1 ton.

The Income

1 kg frog is sold Rp. 30,000 so 1 ton of frogs will give the income :

Rp. 30,000 x 1,000 = Rp. 30,000,000

The Profits

Total cost = Rp. 3,600,000 + Rp. 10,000,000 + 4,800,000 = Rp. 18,400,000

The income = Rp. 30,000,000.

The profits = Rp. 30,000,000 – Rp. 18,400,000 = Rp. 11,600,000 (in 4 months)

So, the frogs farming business give profits Rp. 2,900,000/month.

From 3 ponds, Mr. Wayan expands the business and he has 9 ponds now. 1 pond consists of 6 karamba (cage) . 1 karamba (cage) consists of 3,000 small frogs.

Therefore, Mr. Wayan has :

Minimum 3 ponds x 6 karamba x 3,000 frogs = 54,000 frogs.

Maximum 9 ponds x 6 karamba x 3,000 frogs = 162,000 frogs

The total profits (with 10% estimation of frogs died)

Min = $\frac{54,000 \times 0.9}{4,000} \times 2,900,000 = \text{Rp. } 35,235,000$ (in 4 months)



$$\text{Max} = \frac{162,000 \times 0.9}{4,000} \times 2,900,000 = \text{Rp. } 105,705,000 \text{ (in 4 months)}$$

Partnership and Network

In August 1981 the head of the area in Banyuwangi, Mr. Abidin has order from Mr. Wayan until ten thousand of tadpoles (1-2 month-old) with the price Rp. 25,- In 1993, Mr. Wayan sold the frog seeds to Java island through Mr. Abidin. Then, it was continued by selling through Mr. Wijaya in 1990 – 1995. The first order and second order continued from 1995 -1996. Mr. Wayan also had partnership with hospital and orphanage Sumber Kasih at Menganti Wiyung Surabaya, with Mr. Rudy Hartono. Mr. Wayan also ever had partnership with some parties, such as Mr. Franky. He is the collector in Surabaya. If it is suitable and can reach the standard size, the frogs can be exported to Singapore. Singapore demands for 10 tons frogs per week, while local demands for 2 ton in a month. There also Mr. Gunawan, Sentot, Subagyo and Mrs. Lanny who offer all facilities, including ticket, accommodation, land but with the requirements of supplying thousands of tadpoles/week as the target. This is quite demanding, considering frogs also affected by nature.

Some risks Mr. Wayan has to face in selling tadpoles also become the challenge for him. Mr. Wayan sells 1 packet of 10,000 tadpoles with the price of Rp. 200/each. In the rice field pond which use net at the bottom, tadpoles collected using dustpan fish, there is the risk of scratch and die. Therefore, in the delivery there is always 1,000 tadpoles extra to anticipate mortality. Mr. Wayan brings the tadpoles to Surabaya with small minibus using the big pails. One pail can consist of 750 tadpoles covered with mosquito's net, so the tadpoles still can get the oxygen. The water is only half of the pail for air circulation, and at every place the car stops, the pails can be filled again with water. One bad experience happened when Mr. Wayan suffered for the lost almost Rp.4,000,000. There was traffic jam during the delivery and he was about to go across at the harbor of Gilimanuk, many tadpoles died. It was really stressful. Compare to his wife's salary, which was Rp. 100,000/month at that time, the lost was around 40 times his wife's salary.

At that time, there were many Balinese people depend their life in tourism business, considering Bali island is the main destination for tourism and it is famous for its beach and nature. However, when the incident of bomb explosion happened, the income from tourism aspects decreased and many people tried to look at this business as a prospect.

Nowadays, Mr Wayan has been using one channel to market his bull frogs for many years. The marketing agent is Mr Yohanes. Mr Yohanes give his opinion ,” Actually



the demand of bullfrog is quiet large, but to become a good frog farmer will require patience, perseverance and hard work. Many people try to do bullfrog farming, but few lead to success”.



Figure 16
Mr Yohanes (on The Left) And Research Team

Mr. Wayan has farmers as his partners in the process of developing the frogs in the field in Bali : 50 farmers at Negara, 32 farmers at Mengwi, 150 farmers at Gianyar which consist of 3 groups, Klungkung and Gianyar, there are 50 farmers each.



Figure 17
Frogs are Ready to Send to The Restaurant

One obstacle recently is to produce frogs which include in the “Size.” The common price is Size 4 Rp. 27,000/kg and Size 3 Rp. 30,000/kg.



In another occasion, one research team interviewed Mr. I Made Siasa, a farmer who visited Mr. Yohanes. Mr. I Made Siasa was the leader of UPP (Unit Pengembang Perikanan)/Fishery Development Unit, the secretary of KTNA (Kelompok Tani Nelayan Andalan)/ the group of Farmers and Fishermen, the deputy of HNSI (Himpunan Nelayan seluruh Indonesia)/Indonesian Fishermen Association and the deputy of HKTI (Himpunan Kerukunan Tani Indonesia)/Indonesian Farmers Association. According to Mr. I Made Siasa, frogs farming actually is good prospect of business because the number of frogs died is quite low. Besides, the demand for frogs is big. Surabaya has demand for frogs for 2 – 3 tons and Jakarta has demand for 5 tons.

Bull frogs in Bali are marketed in restaurant and supermarket. Almost all frogs marketed alive, except for supermarket where they request for frozen frogs. Demand from restaurant can be met entirely by the farmer, while supermarket demand not yet fulfilled.



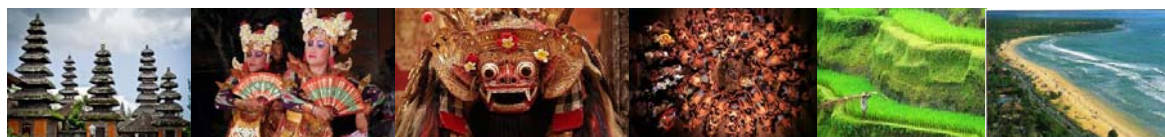
Figure 18
I Made Siasa

Development Impact

From all of the innovations have been made, Wayan has shown persistency to grow his bullfrog farming. The table below summarizes the development and the impact of those innovation.

Table1
Development and The Impact

No	Development	Impact	Reasons
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What have been done			
1	Batteray pond	<ol style="list-style-type: none"> 1. Allows effective monitoring ; 2. Allows effective feeding; 3. Easy Harvesting; 4. Efficiency of water use 5. Prevent cannibalism 	<ol style="list-style-type: none"> 1. Small area of ponds allow effective monitoring, feeding and harvesting 2. Since frogs are sorting base on their size, they won't be any cannibalism Water level can be adjusted based on frogs size, avoid drowning small frog and also make the use of water more efficient ;
2	Bended Metal pole for each corner	<ol style="list-style-type: none"> 1. Frog population is assure 2. Preventing predator to the ponds 	<ol style="list-style-type: none"> 1. Using net and bended metal in every corner can prevent the frog from jump and escape from the pond. Every time the frog attempt to jump, the bended will make them flip over. 2. Bended metal also protect frogs from predator such as snake.
3	Ponds' drainage system	<ol style="list-style-type: none"> 1. Time efficiency 2. Worker Efficiency 3. Cost efficiency 4. Clean and healthy pond 	<ol style="list-style-type: none"> 1. Fast and easy drainage process, and can be done only with one person. This impact to the number of employee needed and also labor cost. With this system Wayan could save 66% of labor cost, since he can reduce the number of employee from 3 to 1. 2. Food residue and dirt can be cleaned easily without moving the frogs. This will keep the ponds clean and ensure frog quality.
4	The standardize feed	<ol style="list-style-type: none"> 1. Standardize feed can guarantee the frog size and quality 2. Frog can be harvest in scheduled time 	<ol style="list-style-type: none"> 1. With the standardize combination (egg yolk, smoothen fish, concentrate) frog can reach optimum size in good quality 2. Frogs grow in time, so they can be harvest at 7 months old.
5	Pairing ponds	<ol style="list-style-type: none"> 1. High and successful level of pairing; 2. High egg production 3. High survival rate 	<ol style="list-style-type: none"> 1. Pairing system make frogs pairing happened in conducive situation. Quiet and protected against any disturbance. 2. Frog become calm so they do not destroy the eggs. 3. Eggs will be floating on the water, make it easy to collect and move them, resulting in high survival rate.
6	Dividing pond based on frog life cycle	<ol style="list-style-type: none"> 1. High grow rate in tadpoles stage 2. High grow rate in mature stage 	<ol style="list-style-type: none"> 1. Tadpoles are moving actively so they need more space. They also need natural food such as mosquito larva and plankton 2. Tadpoles need natural environment to reach optimal growth 3. For mature frog, they should be moved to restricted area, so they will have less



			move and grow rapidly. Beside that, big frog has slow move and easily catch by predator.
Planned innovation for future			
1	"back cross"	To get pure strain	To get high quality strain

Many Innovations tha has been done give positive impact to bullfrog farming. Every development begin with problem solving view. This spirit result in many business innovation.

Scalability and Replicability

Based on data of frog demand, wether from industrial demand or consumption demand we can conclude that frog business has good opportunity. National and International demand are very large and still unfulfilled. This condition happened because of the shortage of supply. Only few farmer run this business professionally and with high pasionate.

This condition make the scalability of this business is still wide open. With all innovation and strong motivation, any farmer can grow in this business. Mr Wayan is the good example. His passion lead to good future, become the biggest farmer in Bali. If many farmer follow his path, soon we will see Bali as the centre of Bullfrog farming.

Many effort that has been done by Mr. Wayan lead to many innovation. These innovation bring positive and significant impact to quality and quantity of the frogs. The demand in market required standard size, national market require 1kg contain 3 or 4 frogs, and for international demand the size should reach size 3 (1 kg contain 3 frogs). In quantity, Mr Wayan succeed to manage the maximum quantity of his farming. All of these came from simple day to day ideas, which do not require large investment. Hopefully this spirit could inspire many farmers, so they have willingness to try and passion in running this business. As long as they want to learn and love what they do, all investment the made will return in good profit.



Researches in Frog Farming

The research had been done by UI and Udayana students. UI students more focus to do hybridization between local frogs or frogs rocks with bull frogs. However, this research had not given the result yet because there were some obstacles, mainly because local frogs were wild and could not do hybridization in cage system.

Research done by Udayana students worked together with Warmadewa. They stimulated the frogs so they could have hybridization faster by using small dosage of pyroxene. The result was satisfying but the disadvantage of this system is the size of the frogs were small and they could not grow bigger. Besides that, the frogs became weaker.

The frogs are given vaccine and injection so they can not get the disease such as avian influenza. There has been no avian influenza diseases on frogs. However, Mr. Wayan decides to select those frogs which are sick because the price of vaccine is quite expensive and it takes time for that vaccine to work. When the vaccine starts to work, there are some frogs has already been infected. Selecting and separating the sick frogs out from the healthy ones are the effective and efficient ways. Besides it is cheaper, the spread of the disease can be avoided.

Some of disease in frogs is frogs keep turning around. After being checked in the laboratory in Denpasar, the frogs have suffered the nerve system disease. Another thing is, the frogs can also twist its legs, they cannot walk and can cause pus, weak, swollen, scratch and wounded. That can also happen if the food given is too much.

Research was also done to decide the cost production of food for frogs. The cost of food for frog is Rp. 1/frog/day. Nowadays, the price is increasing 3 times. It becomes Rp. 8/frog/day.

It means Rp. 250/frog/month x 4 months is Rp. 1,000/frog which are ready to sell. The price of the seedling is Rp. 2,000 so the total becomes Rp. 3,000. The cost of manpower per pond to be cleaned for 5 minutes; 1,000 frogs need 20 ponds with 1 hour 30 minute/day. Regional minimum wage for Tabanan area in 2012 is Rp. 1,005,000.

The price of frogs is Rp. 27,000/4 = Rp. 6,250/frog, so the profit (out of the cost of working) is Rp. 3,250/frog. To get the proper profit, the business needs to sell 1 packet, 5,000 – 10,000 frogs.

Research done by Mr. Wayan is to do hybridization process with back-cross system. This method was done by crossing of a hybrid with one of its parents. This is done to



achieve the offspring that has genetic identity with the parents. This research is done by Mr. Wayan until the end of 2012.

Reward

Mr. Wayan has got many rewards about his struggling and hard work in bull frogs farming, including :

1. Rewards from PERURI in the form of gold medal, pegging the first pole of the building of money printing RI in Karawang, West Java, Monday 24 June 1991. PERURI gave the rewards to those business man who has the spirit to move forward and develop, support the national development.



Figure 19
PERURI Rewards

2. Those business man who has innovation in frog farming business, it was given in 1993 by Bali regional government.
3. Person with the most frogs, which is given by Daily Newspaper Nusa Bali on 30 January 2006.
4. The reward of Ristek in the category of innovative and creative people, as the second winner on bull frogs farming (*Rana Catesbiana*) with battery cage system. It was given by the minister of technology and research on the day of the rise in national technology (HAKTEKNAS), 10 August 2009.
5. Reward on participation in field observation activity by supportive manpower training activity participant, PNPM Sea and Fishery, Rana Agung, BR Pande, Jegu village, Penebel area, May 2010.



6. The winner of competition "Sang Penemu (The Founder)" which is organized by LPP TVRI in Bali, July 2011.
7. Reward from governor in Bali SILPAKARANUGRAHA, the reward in research and technology in 2009. The reward in creative innovation of frogs farmer with the innovation of battery cage.



Figure 20
The Research Team With Mr Wayan at Rice Field Pond

Conclusion

Innovation in the business world is indispensable. Learning from the experience of Mr Wayan, even on a simple and small business, willingness and perseverance to keep making innovation will lead to success. This case study also give us lesson that being innovative is not a matter of formal education of a person, but more emphasize on willingness to learn from many sources and keep trying to find better solution.

The market demand for bullfrog is still large, yet this great opportunity has failed to be captured by farmers. The main reason is because most of farmers has tendency to be not innovative, avoiding risk, and lack of perseverance



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Yohanes, Kapal, Mengwi, 06 February 2012, 07 February 2012, 10 April 2012, 11 April 2012, 12 April 2012



I Made Siasa, Kapal, Mengwi, 10 April 2012

Store Manager of Tiara Dewata Supermarket, Denpasar, Bali, 11 April 2012

Cashier of Istana Restaurant, Teuku Umar, Denpasar, Bali, 12 April 2012

Profile of Case Writers



Liliana Inggrit Wijaya, has been the Head of Management Department of Faculty Business and Economics Universitas Surabaya since 2011.

Her career began as a lecturer in a major field in financial management such as corporate finance, personal finance, investment analysis and portfolio theories, and also multidisciplinary subject as strategic management, business ethics, information management system, business leadership and entrepreneurship. She also became supervisor for thesis. She graduated

from Ubaya University Master degree with specialization in Finance.

She has published many articles for the topic research, such as good corporate governance, financial performance, corporate social responsibility and stock market analysis.

The structural position in Faculty Business and Economics Ubaya University before, were Head of Master Management Program until 2011, Head of Management Department until 2007 and Vice Dean until 2003. Also as a Director of External Efficiency Competition Program of Management Department of Faculty Business and Economics Universitas Surabaya, granted by Indonesian government since 2007-2009.

Besides her academic career, she also a trainer and consultant for financial planner including investment project purposes, retirement planning and estate planning, business project planner and also in entrepreneurship. Many business project plans that supervised by her have been realized and succeeded.



Dudi Anandya was born in Surabaya and achieving bachelor degree in electrical engineering. Further he show more interest in Marketing, and start studying marketing in Universitas Indonesia Dudi has joined Universitas Surabaya since 2002, and since that he involved in many activity such as lecturing, research, and become board editors of the campus journal.

He teach consumer behavior, marketing research, integrated marketing communication, and global marketing. Most of his study root in consumer behavior.

Today he become the head of marketing laboratory in management department, and also head of board of editor in campus journal and also become a reviewer.

Fitri Novika Widjaja , Born in Pasuruan, East Java in 1972 and completed the Bachelor of Education Statistics 1995 and Master of Technology Management 2002 in Institut Teknologi Sepuluh Nopember Surabaya. Beginning in 1996 teaching at the Faculty of Management Department of Economics, University of Surabaya. Besides doing research, he also became a lecturer for the course of Operations Management, Customer Relationship Management, Business Statistics, Quality Control Assurance and Logistics Management. Since 2007 until now, became Head of the Laboratory of Operations Management and a companion for several student activities and as an academic advisor. In addition to attend the training is also a trainer at the Carrier Assistant Center (CAC UBAYA) with the theme of presentation skills and time management.

2007 to 2009 to be one PIC on the implementation of the Program Grant



Competition (PHK A3) is given by the DIKTI.

The results have been published, among others: Descriptive study in the Public Services Quality of Surabaya (2011), Analysis of Surabaya Tourism Economic Potential (2011), Descriptive Study Logistics Service Quality Perceptions of PT POS Indonesia Surabaya branch of the South on the Service Parcel Post (2011), Descriptive Study On Destination Image Perception By The Surabaya Domestic Tourists (2012).

Profile of Institution



As vision to be the first University in Heart & Mind, The University of Surabaya (Ubaya) for more than 4 decades has committed to working with excellence in teaching and research as well as to nurturing close ties with local and international communities. Over 9,000 students including some international students make up the university as a home to a diversity of cultures. All academic programmes in six faculties were accredited by the National Accreditation Board of Indonesia as a sole accrediting body for institutions of higher learning in Indonesia, and today become member of AACSB. Ubaya has 3 “leafy green” campuses at Ngagel, Tenggilis and Trawas. The university offers first class facilities with generous teaching and research support.