

Initial investigation on the Libmanan-Cabusao Dam Project (LCDP) in Sipocot River

Introduction

The Libmanan-Cabusao Dam Project is proposed by the National Irrigation Administration (NIA), Region V, based in Naga City. It has been given an Environmental Compliance Certificate (ECC Reference Code 0904-008-4520) by the Department of Environment and Natural Resources (DENR), Quezon City, dated April 20, 2009 and signed by the DENR Secretary Jose L. Atienza, Jr. (**Appendix A**). The duration of the project is 3 years. Based on its Environmental Impact Statement (EIS) of March 2009, its objectives are: 1) to optimize the use of water and land resources by replacing the pump used to irrigate the present system with a concrete diversion dam [in general], and 2) [specifically] to cut down the cost of operation and increase farm income in aid of farmer beneficiaries.

The project however is not located in Libmanan, rather, it is in Sipocot, Camarines Sur with backwater (inundation water) in 13 barangays of Lupi and 1 barangay in Sipocot. Currently, the dam is being constructed (**Appendix A1**) in Barangay Malaguico of Sipocot and has been going on for the last 4 months with a contract to finish in 18 months.

The fear of concerned residents of Lupi led them to seek assistance from the INECAR to investigate the problem. Likewise, Bishop Jose Rojas, Jr. of the Diocese of Libmanan also made a request to the undersigned because of the serious apprehension of the people from the same municipality regarding the possible destruction that could result upon the completion of the dam in Sipocot. As this matter is of great concern, the Institute for Environmental Conservation and Research (INECAR), Ateneo de Naga University, conducted an initial investigative study in October 17, 2009 for the following objectives:

- 1) To know the current status of the dam being built in Sipocot
- 2) To assess the approved Environmental Impact Statement (EIS) of NIA
- 3) To find out the sentiments and fear of the people of Lupi regarding the dam project
- 4) To propose possible alternatives for sourcing water for Libmanan and Cabusao

Methodology

The preliminary investigation was done by the INECAR study team consisting of five persons (Ms. Joanaviva Caceres, Ms. Shane Bimeda, Mr. Alex San Jose, Mr. Pedro Prima Jr., and Dr. Emelina G. Regis as the Team Leader). Other volunteers were Mr. Victor Nierva, a faculty of Ateneo de Naga University, Mr. Jonas Soltes, a reporter from The Inquirer based in Legazpi City and former Mayor Sebastian Perez of Lupi.

The methods used were as follows: a) photodocumentation of the sites, b) interview with knowledgeable persons in the dam site, i.e., Project Manager of the dam construction, the Barangay LGUs and some residents of Lupi. Other methods used were c) determination of elevation and geographic coordinates using a Geographic Positioning System (GPS) and a

map (**Appendix B**) of some areas from Sipocot to Lupi, d) collection of some sediments in the dam site for sediment characterization (Fanning and Fanning 1989; DeLuca and O'Herron 2002), measurement of water pH and salinity with pH meter and refractometer respectively, and e) finding out flooding occurrences in the area. Some printed documents were also consulted and these are the Environmental Impact Statement (EIS) of the project (National Irrigation Administration or NIA as proponent) dated March 2009, Environmental Compliance Certificate (ECC) given by the DENR to the proponent, and written concerns with signature of the people of Lupi.

FINDINGS

A. The current status of the Dam Project

The project intends to provide irrigation water for increasing production of rice from 4,000 – 4,800 hectares of agricultural land in Libmanan and Cabusao. Nevertheless, the mode of implementation shows some vagueness and generated some suspicions from the local communities especially in Lupi and Sipocot, Camarines Sur.

1. The name itself “Libmanan-Cabusao Dam” is confusing because the dam is to be constructed in Sipocot with backwater in Lupi. Why did they not name it Sipocot-Lupi Dam?
2. The above slanting of the name is probably the reason why most of the information in the EIS is on the benefits of the dam to Libmanan and Cabusao with minimal mention of the impacts to Sipocot and Lupi. In reality, Libmanan and Cabusao are beneficiaries while Sipocot and Lupi are direct impact areas which might be adversely affected by the project.

It was also wrong to classify Lupi as an indirect impact area based on the EIS (March 2009) because when the dam is constructed, 13 barangays or about 1/3 of Lupi's barangays will be inundated with water. This value is based on the account of the local people in Lupi due to the presence of several tributaries (creeks) and local communities along the banks of these tributaries.

Direct impact results from direct action of a human activity such as the setting up of a dam accompanied by inundation, or natural phenomenon such as typhoon. Indirect impact is a consequence of the direct impact such as displacement of people and poverty due to inundation of land by the backwater when a dam is constructed.

3. Based on the interview with the Project Manager of the dam in Sipocot, “at elevation 14.3 m, the shape of the dam is such that water will just flow freely. Then water will go up to elevation 15 (means 15 meters) and the control of the water is in elevation 26 but this is not anymore within their scope because the water will just go down to the (link) canal” (summary of the interview dated Oct. 17, 2009 translated in English) and convey water to Libmanan and Cabusao. Take 3.3 m (which is underwater), from

elevation 14.3, the above water elevation of the dam structure from sea level is 11m which is equivalent to about a 4.5-floor building (assuming that each floor has a height of 2.4 m).

Why should the water still go up to elevation 15?

According to the Project Manager and the Project Engineer, at that elevation, water falling down will have a boost of energy when it drops down the diversion (link) canal. The energy generated will be sufficient enough to push water upwards toward higher elevation because the terrain of the land, where the water will be conveyed to Libmanan, is higher. Once it is on top, water will then travel for “10.28 km from the dam towards the inlet of the existing pump station” (p. 1-3, Project Component under Basic Project Information). The pump will drive the water to the intended ricelands to be irrigated.

This kind of system seems absurd. In order to obtain irrigation water, it would be easier to access water nearer the beneficiaries (Libmanan and Cabusao) by simply connecting to the river that flows through two municipalities. Note that the river concerned here is only one river with different names based on where the river segment is located. Hence, it is called Sipocot River in Sipocot and Libmanan River in Libmanan (**Appendix C**).

4. When the dam is constructed, the problem on pollution by toxic phytoplankton begins. Because of the predominance of sand, silt and clay, these loosened materials that erode from the river bank and carried by strong currents downstream will be trapped by the walls of the dam and accumulate there. Nitrates from household activities and other organics will accumulate and encourage the growth of phytoplankton (microscopic plants and plant-like organisms), especially toxic species that are not eaten by fishes. Abnormal growth of phytoplankton could result to algal bloom which eventually uses up the oxygen and suffocates the fishes. This process is known as eutrophication. Consequently, there will be a reduction in biodiversity as well as productivity of the river in upstream Sipocot and Lupi because of deprivation of food, lack of oxygen and toxins released by phytoplankton causing death to fishes and other aquatic organisms (Corrales ,R.A. 1991; Manahan, 1994; Nebel and Wright, 1996, Miller 2000).

Moreover, a study by Ampongan and Fraginal (2004) in Barit River, the river that drains Lake Buhi, Camarines Sur, suggests that the Hydraulic Control Structure in the Barit River is one of the causes of the deterioration of the water quality of the same river. At the Lake side of the control structure, water is polluted having toxic alert Level II. This means that the number of toxic phytoplankton per liter of water is high, thus unsafe for human consumption. Toxic phytoplankton also causes a lot of skin diseases called contact dermatitis to people.

5. Salts can also accumulate from trapped sediments submerged in water which can make water saltier and become unsuitable for growing crops (Miller 2000).

B. The Environmental Impact Statement (EIS) of the National Irrigation Administration (NIA)

1. Executive Summary - The map (Figure 1.1) General Layout of Libmanan-Cabusao Dam Project (p. 1 of Executive Summary).

Comments:

The map does not show that the project site is in Sipocot and the backwater is in Lupi (**Appendix D**). Without showing a more appropriate map, some of those reading the EIS will focus on Libmanan-Cabusao situation. Note that both Libmanan and Cabusao are beneficiaries while Sipocot and Lupi are impact areas. This is important for those who are evaluating the proposal

2. It was also wrong to classify Lupi as an indirect impact area based on the EIS (March 2009) because when the dam is constructed, 13 barangays or about 1/3 of Lupi's barangays will be inundated with water. This value is based on the account of the local people in Lupi due to the presence of several tributaries (creeks) and local communities along the banks of these tributaries.
3. Project description p. 3-7, section 3.4 Project Development Plan and Project Components, 3.4.1 Diversion work.

- "the extent of the inundated area upstream of the dam at Elevation of 15.00 is estimated at about 186 ha. Once the dam is constructed. The barangays included in the 186 ha. area are: portions of Yabo and Malaguico in the municipality of Sipocot and 8 barangays in the municipality of Lupi. The barangays in Lupi are: Tapi (Lupi Nuevo), Poblacion (Lupi Viejo), Barrera Jr., San Isidro, San Rafael Sur, Bulawan Sr., and Colacling."

Comments:

Lupi, Yabo and Sipocot Rivers have about 13 tributaries (based on the account of former Mayor Sebastian Perez of Lupi). There are other communities/sitios/barangays along these tributaries not mentioned in the report.

4. (2nd paragraph of EIS under Project description p. 3-7, section 3.4 Project Development Plan and Project Components, 3.4.1 Diversion work).
- "Based from regional geomorphological mapping conducted by the Mines and Geo-Sciences Bureau in Region 5, the geohazard and vulnerability assessment made on the proposed dam site areas indicates that the proposed Libmanan-Cabusao dam site area at Bgy. Malaguico falls under areas where liquefaction occurrence is unlikely to happen, under areas not prone to ground settlement or ground subsidence, under areas

with moderate susceptibility to landslides, and under non flood prone areas, i.e areas with no reported flood occurrences except low lying areas adjoining rivers and creeks”

Comments:

Based on the interview by INECAR with the barangay LGUs and some residents of Lupi in Oct. 17, 2009, flooding occurs only during strong typhoon, especially super typhoons with heavy rainfall. Floodwater simply passes by and does not stay for long hours or days. For instance, during the height of Typhoon Rosing in 1995, floodwater reached up to the market place of the town proper at elevation 14 m (the church is not flooded because its elevation is 15 m asl.). Other occurrences of strong typhoons raise the water of the river. Pictures taken from the riverside shows the extent of the rise of floodwater in the river. Note the plastic garbage hanging on the trees and exposed surface of the riverbank that indicate the height of the river water (**Appendix E**).

Therefore, the flooding occurrences in Lupi are normal occurrences because this is even happening in some lowland areas of Libmanan, Sipocot, San Fernando, Milaor, Canaman and Naga City and other areas in the Bicol Region and the whole Philippines. Should the communities here be relocated too?

The flooding of Lupi and part of Sipocot to give way for the construction of the dam is not justified in this sense in order to serve the poor people of Libmanan and Cabusao by displacement of another group of poor people in Lupi and probably make them even poorer.

5. “Figure 4.1.2.3.2.7 Sipocot Quadrangle and Dam site Flood Hazard Map on page 4-9 under Baseline Environmental Conditions, Impact Assessment and Mitigation, section Land Use Classification.” (**Appendix F**)

(2nd paragraph p. 4-9)

- “The proposed Libmanan-Cabusao dam site at Bgy. Malaguico falls under non flood prone areas i.e areas with no reported flood occurrences except low lying areas adjoining rivers and creeks. See Figure 4.1.2.3.2.7 Sipocot Quadrangle and Dam site Flood Hazard Map.”

Comments:

Note that in this Figure, the upper left side of the map shows that the areas near Lupi poblacion is characterized as “occasionally to rarely flooded areas while Sipocot is characterized by “regularly to frequently flooded areas” and “occasionally to rarely flooded areas. There are also areas “prone to riverbank erosion”. (**Appendix F**)

The dam site in Bgy Malaguico (4-5 m asl) is slightly lower in elevation than the town of Lupi (6-15m asl) and part of Sipocot due to the terrain of the land that is rolling. Nevertheless, as the concern is only one river that flows through three municipalities (Lupi, Sipocot, and Libmanan), it is surprising that a dam should be constructed for obtaining only irrigation water and inundate 13 barangays permanently, destroy

vegetation and relocate people. Because of the permanency of the inundation water, there will be situations that the dam could break (Please see comments for No. 6 below) or released water to reduce pressure as what has been done in other dams in Central Luzon that caused flooding of adjacent low lying areas.

6. (last paragraph p. 4-10) Baseline Environmental Conditions, Impact Assessment and Mitigation, section Land Use Classification.”

“Considering the earthquake magnitude and the proximity of its epicenter to the proposed dam site, it is reasonable from the engineering stand point of structural design to adopt the maximum earthquake of 7.6 in determining the maximum peak ground acceleration for the derivation of design earthquake coefficient. However all records were used and analyzed.”

Comments:

Disasters caused by earthquake are not only due to its magnitude but the types of soil and rocks common in the area that is susceptible to ground movement even under lower earthquake magnitude. Disasters also occur in areas characterized by soft sediments making ground movement severe and longer. Since the sediment types in the area are predominantly clay, sandy clay, loamy sand and sand which are mostly calcarenitic comprising of aggregates, some are with pores, while others are soft (based on the INECAR preliminary assessment which is also the findings as stated in 4.1 of the EIS, section 4.1.3 Pedology (p. 4-12), this condition will definitely worsen ground movement resulting to destruction. (**Appendix G**)

C. The sentiments and fear of the people of Lupi regarding the dam

On Social Acceptability

1. Why did the people sign the paper that seem to signify acceptability (labeled Attendance during consultation done by NIA with government agencies and the communities – See EIS Attachments)?

Based on the interview conducted by the INECAR in Lupi (Oct. 17, 2009), the following accounts are narrated:

- a) They were asked to sign the attendance sheet. The speakers were talking about benefits of the project. That is why some of them like the project. There was no mention of the impacts of the project to them. They did not know that signing the attendance sheet could be used as a proof of social acceptability
- b) The explanation sounded very nice, that is probably why those who attended the consultation meeting, signed the form given to them.
- c) The form was an attendance sheet. They were told to sign because those who will not sign will not be given food.
- d) They were denied proper information about the project. It was only recently that they learned about the possibility of being relocated.

- e) That the people should not be relocated. The relocation site has no sure livelihood because the space is limited to the size of the house. How could they take care of their animals?
- f) There are more than 5 kinds of fishes in the river, many birds and other animals such as singalong, goto, anis, boot (without teeth and looks like an anteater) that will be affected

Some additional experiences during the consultation meeting in Libmanan were as follows:

- a) the concerns of the residents in Tapi were not properly answered. Some members of the government agency even made fun with their responses, thus, the people from Tapi left the meeting.
 - b) According to the resolution during the consultation meeting in Libmanan, those that will be directly affected are those residing near the banks of the river.
 - c) They requested for a meeting with NIA several months earlier but until now, they are silent. NIA should conduct a public consultation with the people
2. Based on the consultation/interview conducted by the INECAR with the barangay LGUs and one Municipal Councilor, the silence of the mayor is bothersome. Most of their concerns were not heard, nor acted upon. It was only during the actual construction of the dam that the local communities realized the impacts to their homes and livelihood.
3. In Lupi, there are 941 signatories from the Poblacion and surrounding barangays (**Appendices H1-H7**) that do not agree to the construction of the dam in Barangay Malaguico. Their concerns are as follows:
- a) No legitimate and proper consultation. Their concerns were not heard. This is a violation of their rights to be heard
 - b) The information based on the Community-Based Monitoring System that only 300 families will be affected is wrong. They believe that there will be more, about thousands. That the number 300 came up only for the proposal to be approved.
 - c) No discussion on paper about the negative effects of the dam to them, only the positive effects to the beneficiary communities (Libmanan and Cabusao).
 - d) In contrast, their communities will not benefit from the dam, instead, it will bring destruction to their farms, livelihood and homes
 - e) They do not need a dam. What they need is a good system of management, clean leadership, concern for the poor, and overall concern for the well-being of the people.

On the possible impacts to the people

1. In terms of agriculture, the EIS states that the agricultural area of Libmanan is 23,836 ha. while that of Sipocot is 70.72% only (p.12 of EIS Baseline Characterization section 3.4. The People, 3.4.1 Demographic Profile). Based on the above value for Libmanan, the proportion of its agricultural area against its land area (33,620 ha.; Camarines Sur data of 2007) is 70.9% while that of Sipocot is 80.64% because Sipocot has 21,160 ha with 17,062.92 of these are agricultural. If the dam fails, Sipocot has more to lose. Both these municipalities have lowland and upland crops.
2. The town of Lupi has also a historical value. It is a very old settlement found by the Spanish colonizers when they came to the Philippines. The first church was founded in Oct. 17, 1726 in Barangay San Pedro (**Appendix I**). Thus, communities here have their own culture which is very dear to their hearts. The inundation of water will definitely create a deep sense of loss among the affected people because this area is their home, and not merely their house and place of work.
3. Destruction of plant communities downstream is a consequence of the setting up of a dam. For instance, Miller (2000) writes that in a 1997 study in Sweden, dams have reduced biodiversity. Assessment done on several dam sites used for hydroelectric generation in Sweden, there was a reduction in plant communities by 15-50% along the banks of the rivers in comparison with those in free-flowing rivers. Hence, there is a possibility that the inundation of the banks of Sipocot river will suffer the same fate. People in these areas believe that these places have the most fertile soil for growing crops and other plants for their livelihood.
4. Why was the dam placed in Sipocot if the problem was irrigation water?

This is the question that is not clearly answered in the EIS and accounts of people in Lupi. Note that the very purposes of the EIS are only (as stated earlier) 1) to optimize the use of water and land resources by replacing the pump used to irrigate the present system with a concrete diversion dam [in general], and 2) [specifically] to cut down the cost of operation and increase farm income in aid of farmer beneficiaries. The farmer beneficiaries here are those in Libmanan and Cabusao. There was no mention of benefits to Lupi and Sipocot. These two municipalities are clearly impact areas.

Sipocot and Lupi, (especially Lupi) comprise of poor people. Why make these groups of people miserable by displacement and possibly much worse flooding during the rainy season, and eventually make them poorer in order to serve other groups of poor people?

D. Possible alternatives for sourcing of water for Libmanan and Cabusao

The dam in Sipocot is not needed to provide irrigation water. There are cheaper technologies for collecting and conserving water from rainfall and surface runoff. Note that Libmanan River is connected to Sipocot River. Tancong Vaca is also the watershed of Libmanan (**Appendix C**).

1. It is much easier, less costly and less dangerous to access water from Libmanan River than create a dam costing 1.9 billion pesos. In addition, Libmanan is the largest municipality in Camarines Sur. It consists of 75 barangays occupying an area of 336.2 sq. km. Its watershed is in Tancong Vaca where many creeks and springs abound.
2. Farmers in India (R. Saha et al. 2007), Taiwan, and even temperate countries are using a simple structure called “water harvester” to obtain rainwater for their gardens and farms. This structure is actually being use in the Philippines in houses in the rural areas where the surface and ground water sources are far or unavailable. It is very cheap and can be maintained by individual farmers or groups of farmers depending upon its size.
3. Small impounding ponds for rainwater collected during the rainy season can be used by groups of farmers to provide water for their farms. Its maintenance can be shouldered by the farmers themselves
4. A report by Juan Escandor Jr. of PDI (<http://ww.bicolmail.com/issue/2009/june11/xswine.html>) states that “the dam will replace the four units of 250-horsepower engines and pumps that presently irrigate from 2,195 hectares of ricelands in the towns of Libmanan and Cabusao. NIA spends some P7 million annually just for the fuel and oil of the pump engines.”

The dam cost P1.9 billion pesos. At P1.9 billion expense, the above pumps could be operated in 271 years (at P7 M cost of fuel and oil of the pump engines annually). However, because there are other costs such as maintenance and depreciation as well as replacement of units including the need for additional pumps the following opportunities may be considered:

- If the number is doubled = 8 units of pump engines and each pump has an average cost of P3M (consider inflation) = P24 M. Consider operation for 100 years with replacement cost every 5 years, the total costs will be P480 M. If this value is deducted from P1.9 B, the remaining budget will be 1.42 B.
- If the cost of fuel and oil is P12 M (consider depreciation of peso) per year, the 8 pumps could still be operated for about 118 years.

The undersigned recognizes that the above crude calculation does not take into account other unaccounted costs. With this limitation, the number of years may still be reduced. Theoretically however, the pumps are still much economical, without causing displacement of people, undue anxiety over possible environmental destruction and loss of lives and livelihood, than building a dam which could be abandoned in 10 or 20 years because of natural calamities, human error, climate change and earthquakes.

Conclusion

The dam is not needed to provide irrigation water for Libmanan and Cabusao. These municipalities can source water from the rivers and creeks within their land territories. The people of Lupi and Sipocot must not be sacrificed to provide this need as there are other alternatives that are less costly with less impact to the environment and to the human communities.

Recommendations

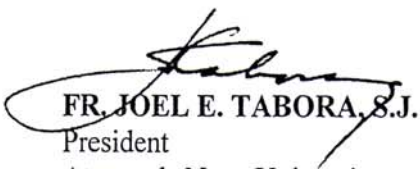
1. Consider the alternatives mentioned under Letter D above.
2. The undersigned is appealing to the sensibility of government agencies who proposed and supported the Libmanan-Cabusao Dam Project (LCDP), and to the people of Libmanan and Cabusao to listen to the concerns of the people in Lupi and Sipocot who will be adversely impacted by the project in order to provide their (Libmanan and Cabusao) need for irrigation water when such resource is at their doorsteps.
3. The undersigned is also urging the same government agencies to rethink their plan and study the alternatives mentioned above to serve the need for irrigation water of Libmanan and Cabusao without causing adverse impacts to the people of Lupi and Sipocot.

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