

1.4 Technology action plan, project ideas, and other issues in the Black Sea coastal zone sector

1.4.1 TAP for the introduction of the reef-balls technology

Following actions have been identified as core actions for transfer and implementation of underwater artificial reef-ball technology:

- **Technology market survey.** Country's priority is to get know-how of the reef-ball technology along with training and to produce it locally. This reduces the shipping expenses and increases the local capacity. To establish joint venture with producer is the next acceptable option. The option less attractive for the country is to purchase a ready product and to import it to the country. However, the last option is not excluded as an initial step (pilot project) for Anaklia segment. In this regard all possibilities existing at the international market should be well investigated to get technically and commercially most appropriate for the country option.
- As far as a technology is new, the **ownership** should be established. There are three options under consideration. The first one considers this technology as a public good (owner is central or most likely local government) for coastal zone protection imported and maintained by the government and offered as an incentive (similar to other incentives already offered by the government to the private sector for development of this segment) to the private sector for developing of diving tourism. Another option is intensive raising of awareness on the perspectives of this technology among private sector operating in tourism development section. Combination of these two options seems to be most cost-effective and less business risk comprising option if Public Private Partnership approach will be applied as far as both partners have interest and profit from this technology. For the government (central or local) this is a coastal zone protection technology which is the direct responsibility of government while for tourism business it could be an additional income and perspective.
- **Capacity building.** The diving tourism elements already are familiar in the country. However, capacity of this type of tourism should be increased and strengthened. Particular elements for training are: marketing, safety measures, code of international standards.

1.4.2 TAP for the decentralized early warning system

Following actions have been identified as core actions for implementation of decentralized early warning systems at the community level:

- Establishing meteorological monitoring system;
- Establishing tidal and sea level raise detecting system;
- Establish capacity (software models and trained people) to forecast the location and scale of threats;
- Establishing an organizing committee (leaders of the community and civil society, NGOs, representatives of local authorities and the private sector);
- Producing a participatory emergency and contingency plan;
- Implementing or strengthening of the existing communication system: early warnings, dissemination of prevention, mitigation and adaptation measures.

It should be highlighted that early warning system is very important instrument reducing damages, but not so effective without other protective measures such as: beach nourishment, artificial/natural knolls/dunes adjusted to the sea level raise, wave breakers, etc. Therefore, combination of different options is recommended in case of Anaklia.

1.4.3 TAP for the beach nourishment in Anaklia segment

Beach nourishment technology is not a new technology for Georgia and it has been using since 1960s. Technology has very high maintenance costs, depends on availability of inert materials and accurate investigation of underwater geology. Because of high costs, the technology has not been used almost for 15 years. Sea coastal zone protection service renewed this process in 2004 and was used in two sites (Kobuleti and Adlia). This technology is recommended by the TNA expert group for Adlia segment as well. Following actions should be taken for implementation of this technology:

- Detailed investigation of hydrology and geology of Anaklia segment. Some preliminary assessments have been already done.
- Inert material is planned to be transported from river Engury bed. Preliminary amount of initially required piling inert materials and amount for annual maintenance are also assessed.
- Transportation options and costs are assessed.
- Software for monitoring of development of geological and hydrological process in future and for monitoring of the results of measures is not available. Local capacity for operation of such monitoring system is not satisfactory. Additional training of local researchers and strengthening of other capacities along with the software is necessary. This part of TAP is particularly related to the climate change impact assessment and is incremental cost for the project.
- Financial sources for implementation of this project are not yet identified.

1.4.4 Brief summary of project ideas for international support (Details in Annex III)

Implementation of community level decentralized early warning systems, reef balls and software (computer model) for monitoring the relevant hydrological and geological processes impacted by climate change are main technologies identified as priorities in this sector. One project proposal has been developed for Anaklia segment of the Black Sea coastal zone for submission to the donor community. This is combination of four (Artificial piling of inert material, Creation of artificial cape, artificial growing of coastal dunes in width and in height and Creation of artificial underwater reef) technologies described in Annex III and included in www.tnageorgia.wikispaces.org.

1.5 Summary

Despite the long term experience and history of implementation of preventive measures in order to protect the Black Sea coastal zone, after the breaking of Soviet Union the situation in coastal zone management has radically changed as well as priorities in its different segments. Government's current policy and structures already existing are mainly oriented to the implementation of post disaster rehabilitation measures. There is no clearly appointed body/structure (which should be at the regional level) responsible for continuous monitoring of processes, considering the future trends and integrating the risks reduction policy in the development strategies and plans. Establishment of such responsible body could be considered as key policy level recommendation issued by the TNA project in order to facilitate the import of advanced technologies and development of local know-how.